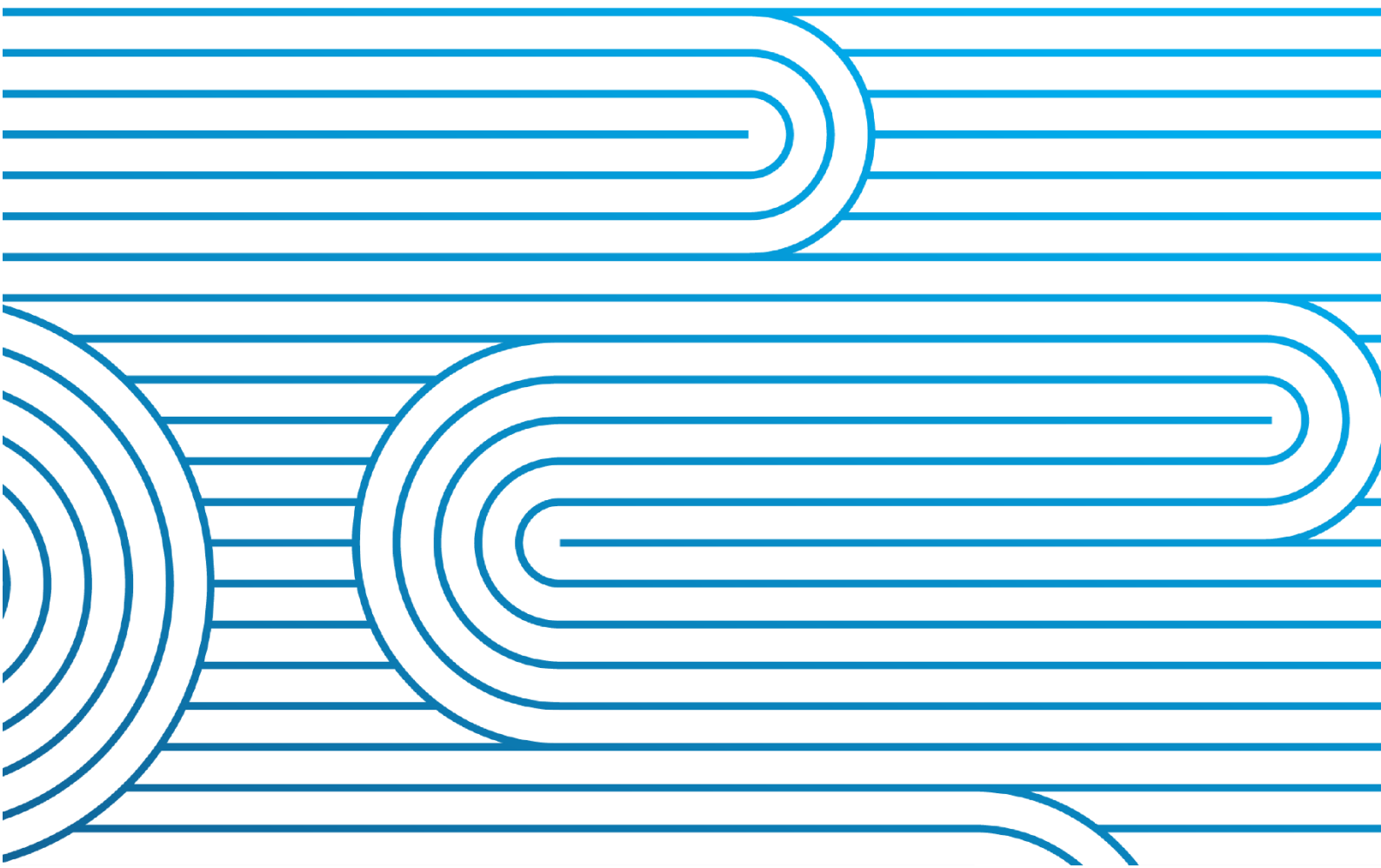


Quarterly System Operator performance report

For the Electricity Authority

April to June 2024



Report Purpose

This report is Transpower's review of its performance as System Operator for Q4 2023/24 (April to June 2024), in accordance with clauses 3.13 and 3.14 of the Electricity Industry Participation Code 2010 (the Code):

3.13 Self-review must be carried out by market operation service providers

- (1) *Each **market operation service provider** must conduct, on a monthly basis, a self-review of its performance.*
- (2) *The review must concentrate on the **market operation service provider's** compliance with—*
 - (a) *its obligations under this Code and Part 2 and Subpart 1 of Part 4 of the **Act**; and*
 - (b) *the operation of this Code and Part 2 and Subpart 1 of Part 4 of the **Act**; and*
 - (c) *any performance standards agreed between the **market operation service provider** and the **Authority**; and*
 - (d) *the provisions of the **market operation service provider agreement**.*

3.14 Market operation service providers must report to Authority

- (1) *Each **market operation service provider** must prepare a written report for the **Authority** on the results of the review carried out under clause 3.13.*
- (1A) *A **market operation service provider** must provide the report prepared under subclause (1) to the **Authority**—*
 - (a) *within 10 **business days** after the end of each calendar month except after the month of December;*
 - (b) *within 20 **business days** after the end of the month of December.*
- (2) *The report must contain details of—*
 - (a) *any circumstances identified by the **market operation service provider** in which it has failed, or may have failed, to comply with its obligations under this Code and Part 2 and Subpart 1 of Part 4 of the **Act**; and*
 - (b) *any event or series of events that, in the **market operation service provider's** view, highlight an area where a change to this Code may need to be considered; and*
 - (c) *any other matters that the **Authority**, in its reasonable discretion, considers appropriate and asks the **market operation service provider**, in writing within a reasonable time before the report is provided, to report on.*

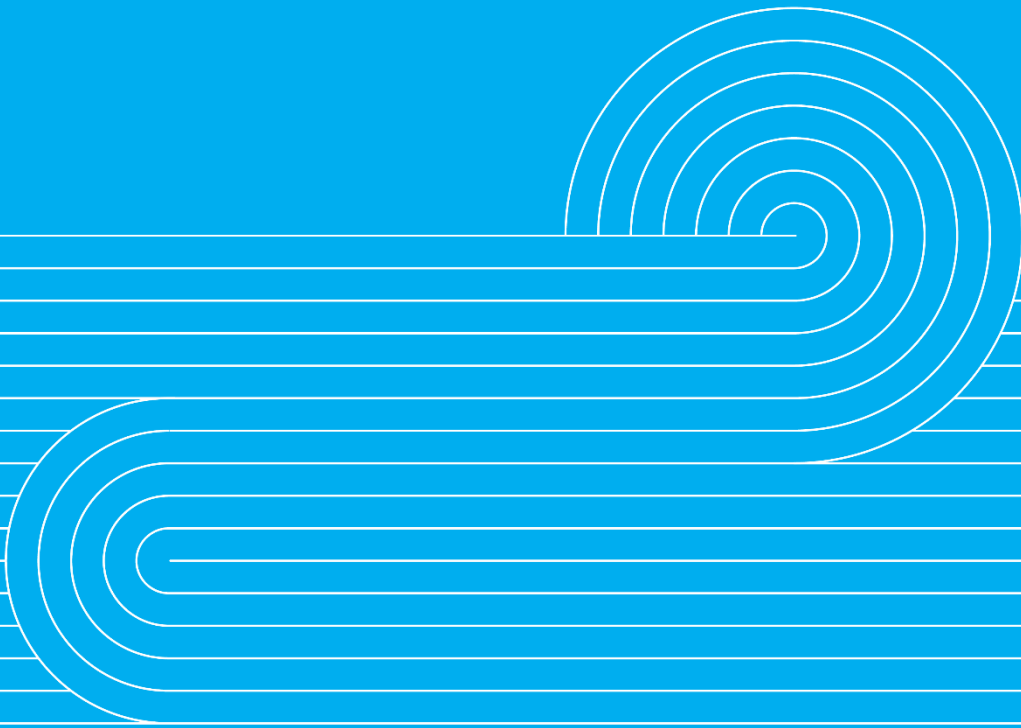
A system performance report is published on the [Transpower website](#).

Contents

Report Purpose	ii
Commentary.....	5
1 Operating the power system	10
2 Power systems investigations and reporting	12
3 Outage planning and coordination	13
4 Commitment to the evolving industry needs.....	13
5 Project updates.....	20
6 Technical advisory hours and services	21
7 Risk & Assurance	21
8 Compliance.....	22
9 Impartiality of Transpower roles	22
10 Performance metrics and monitoring	22
11 Cost of services reporting	23
12 Actions taken	23
Appendix A: Discretion	27
Appendix B: Performance Metrics	28

This page is intentionally blank.

Commentary



High-level update (April to June 2024)

Operating the power system

Shortage of supply: 9 -10 May – On 9 May, we issued a Warning notice (WRN) for 10 May to signal a forecast energy and reserves shortfall over the morning peak. This was the first cold snap of the year with unseasonably cold (and still) weather forecast. We held a System Operator industry briefing at 11:00 to highlight the response requested from the industry, and directly contacted key participants to understand their planned response. The MetService daily briefing at 13:00 indicated demand was likely to be higher and wind lower than then forecast. While the response from industry had been proactive and appropriate to the circumstances, having completed our risk assessment we issued a media release asking the public to be mindful of electricity use over the morning peak. We held another industry briefing at 15:30 to communicate our risk assessment and rationale for the media release. The situation continued to evolve overnight, with shortfall forecast right up to real-time. A shortfall was avoided thanks to a good response from industry and the public. A survey following the event showed near unanimous support for our messaging and coordination, and identified opportunities for improvement that have been incorporated into our planning for any similar future events. A discussion with the CE Forum and Authority on 17 June confirmed industry support for continuing our current approach, and our commitment to provide industry as much time as possible to solve the potential shortfall before asking consumers to be mindful of electricity use as a last resort.

Weather related events: 11-13 May – We issued a Grid emergency notice (GEN) for a G5 geomagnetic storm. A System Operator Industry Briefing was held to inform stakeholders of the situation. Contingency plans, created in conjunction with advice from Professor Craig Rodger from Otago University and practiced as part of our regular training, were applied to maintain security on the system. There was no market impact and supply to consumers was not affected. Following the event we have been collaborating and sharing our learnings with both local (GNS, NEMA, Solar Tsunami Project) and international (National Grid ESO, AEMO, TransGrid, UK Met Office) organisations considering the risk of geomagnetic storms. This has reinforced that we are leading the way in this field in terms of modelling and mitigations, but highlights as a country we lack the level of local hazard monitoring and advice the likes of Australia and the UK have.

Northland Loss of Supply: On 20 June at 11:03 the Huapai_Marsden_1 220 kV circuit tripped resulting in a 159 MW loss of supply in Northland. The cause of the incident was failure of Tower 130 on the Henderson-Marsden A transmission line. Most supply was restored by Thursday afternoon, with full capacity restored Sunday afternoon once a replacement tower was erected. Full security of supply into Northland was restored on Wednesday 26 June after the installation of additional temporary structures for the second 220 kV circuit. A preliminary fact-based report for the incident has been published on the [Transpower website](#) in accordance with our agreed procedure with the Authority. A full investigation report by an independent investigator will be delivered within 90 business days of the incident.

Under-frequency events:

11 April – There was an Under-Frequency Event in the North Island when a Huntly Rankine unit tripped from 210 MW. Ancillary Service Agent's performances during the

event have been assessed and all Ancillary Service Agents have been notified of the results. A report providing causer recommendations has been provided to the Authority.

27 June - An under-frequency event occurred in the North Island when Huntly Unit 1 tripped. The North Island frequency reached 49.205Hz and as a result may not have triggered some of the interruptible load relays.

Use of standalone dispatch:

15 April – We utilised standalone dispatch for a period of approximately 20 minutes due to the Market System Market Operator Interface being unresponsive. The cause of this was identified as a Market System database 'lockup' issue and a temporary workaround applied on 2 April.

11 June – We utilised standalone dispatch for a period of approximately 45 minutes as the result of a planned failover of the market system between data centres.

19 June - We used phone dispatch for about 20 minutes due to issues with the electronic dispatch system. This issue is under investigation by our IST team.

Periods of scarcity pricing:

29 April – We dispatched two 5-minute periods of scarcity pricing in the Hawkes Bay region (Fernhill, Tuai, Redclyffe). This happened as generation at Tuai submitted a bona fide offer change to reduce output, and a constraint on the Redclyffe interconnecting transformers bound. No load-shed was required as the overload was small and quickly rectified. Final prices were ~\$3,200/MWh for the half hour.

10 May - During the evening peak, three 5 minute periods were dispatched with reserve shortfall, resulting in reserve scarcity pricing. The most economic solution was for energy and reserve offers to be used as energy, resulting in a reserve scarcity.

SOSPA and Code annual deliverables

SOSPA reset: The SOSPA contract reset proposal (SOSPA3) was delivered to the Authority on 1 July. We expect to provide a final proposal to the Authority at the start of September after Transpower Board approval in late August.

Security of Supply Assessment 2024: Following consultation the SOSA was [published](#) on 26 June. South Island Winter Energy Margin (SIWEM) has worsened due to an increased South Island energy demand forecast. The New Zealand Winter Energy Margin (NZWEM) and North Island Winter Capacity Margin (NIWCM) have improved due to a reduced demand forecast and an increase in the existing and committed generation pipeline.

SOSPA deliverables: All 2023/24 end of year SOSPA deliverables were delivered on time. The cost of services reporting for 2022/23 was delivered on 5 July 2024.

Outage Planning and coordination

Outage planning: Planned outage numbers requested by the grid owner and other market participants are now low during the winter period. We have completed our assessment of the grid owner's 2024/25 annual outage plan which was published in advance of the 19 May regulatory requirement.

New Zealand Generation Balance (NZGB): NZGB had signalled tight margins through much of May due to high levels of generation being on outage ahead of winter. Margins improved throughout June, however several dates in July have fallen into the potential shortfall category due to peak winter load and NI generation outages for those dates. Enhancements to NZGB were implemented on 26 June, including integration of Yes Energy's Tesla load forecast model and integration of em6 wind data.

Commitment to the evolving industry needs

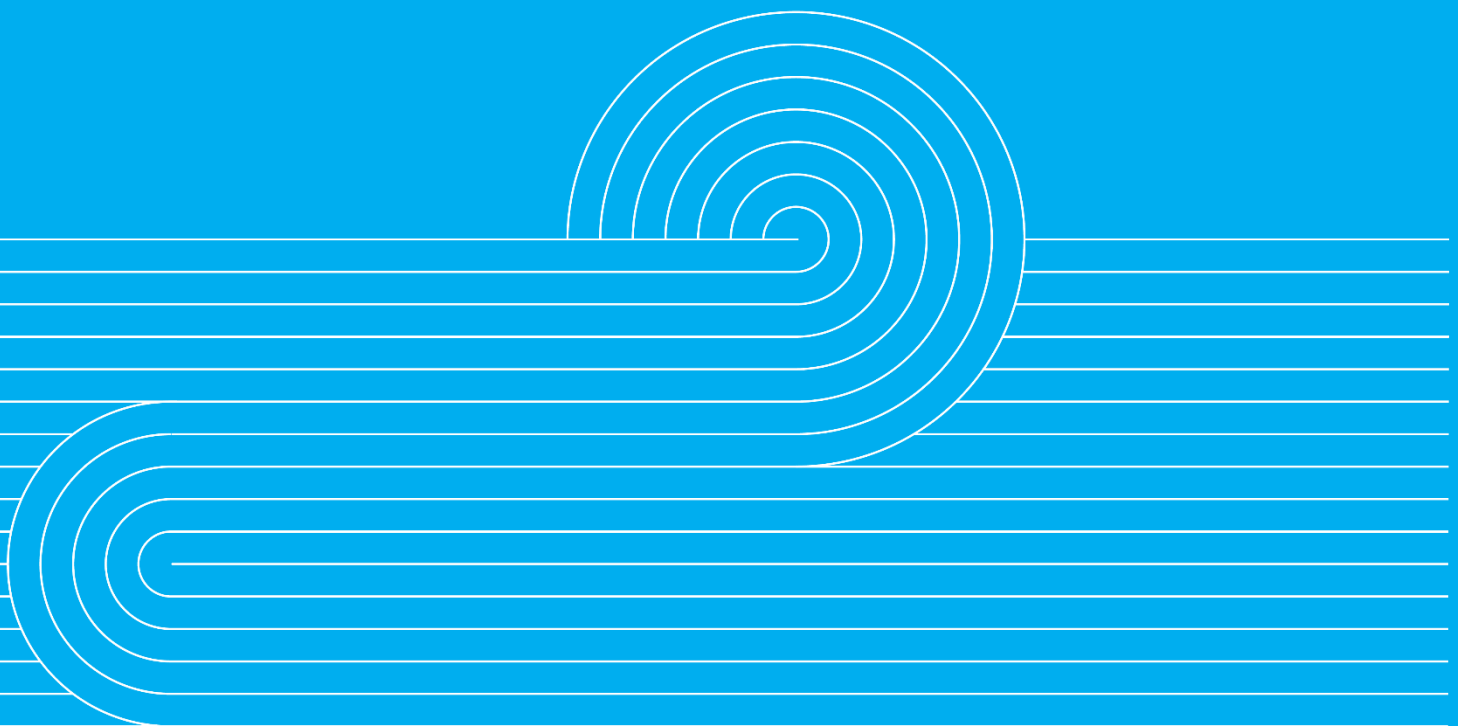
- We held an extended SO Industry forum on 9 April to step the industry through our approach to winter 2024.
- We provided a System Operator submission to the Transpower (Grid Owner) discussion paper "Examining the purpose and future role of our HVDC link".
- Along with the Electricity Authority, we hosted the 2-day 2024 pan-industry exercise which covered a major power system event. We led the day 1 exercise targeted control room operators to test grid emergency processes. We contributed to the day 2 communications and customer team event led by the Authority.
- We began our daily MetService briefings a month earlier than usual to help us better understand the weather risk to peak load and wind generation forecasts to help manage tight situations.
- We submitted our System Operator Rolling Outage Plan (SOROP) [proposal](#) (including our response to feedback received from stakeholders) to the Authority on 31 May.
- A small contingent of our leadership team visited AEMO and TransGrid during June to build stronger connections to enable future sharing and collaboration. Topics include control room operations/staffing, technology and tool development, training, outage management and challenges/opportunities associated with the transition.

Project updates

Future Security and Resilience (FSR): We delivered reports to the Authority on a high-level review on the fault-ride through curves to determine if the curves are fit-for-purpose for synchronous machines and can apply to lower system voltage level, and determining the minimum inertia before the power system will fail to recover from an under-frequency event.

Extended Reserves – Automatic Under-Frequency Load Shedding (AUFLS) transition: We hosted the second industry session in June to provide a general update on progress and shared the improvements to the lessons learnt from previous quarter.

System Operator performance



1 Operating the power system

We coordinated several system events during the quarter, including:

Under-Frequency Event: On 11 April just after midnight, there was an Under-Frequency Event in the North Island when a Huntly Rankine unit tripped from 210 MW. Ancillary Service Agent's performances during the event have been assessed and all Ancillary Service Agents have been notified of the results. A report providing causer recommendations has been provided to the Authority.

Dispatching from backup tools: On Monday 15 April, we had to utilise standalone dispatch for a period of approximately 20 minutes due to the Market System Market Operator Interface being unresponsive. The cause of this was identified as a Market System database 'lockup' issue. Our Market Applications team successfully implemented a workaround on 2 May to resolve these database lockups, and no further issues have been experienced since. We continue to monitor this situation and are investigating a permanent fix. At the time a CAN was issued to industry informing them of the situation.

Hawke's Bay scarcity pricing: On Monday 29 April morning, we dispatched two 5-minute periods of scarcity pricing in the Hawkes Bay region (Fernhill, Tuai, Redclyffe). This happened as generation at Tuai submitted a bona fide offer change to reduce output, and a constraint on the Redclyffe interconnecting transformers bound. No load-shed was required as the overload was small and quickly rectified. Final prices were ~\$3,200/MWh for the half hour.

9 May/10 May - Warning notice (WRN) issued for 10 May morning peak: With unseasonably cold (and still) weather forecast for 10 May, a low residual CAN was issued on 9 May (07:28), based on the 06:00 schedules, for the 10 May morning peak. Forecast energy and reserves shortfall in the 10:00 schedules triggered a WRN to be issued at 10:51. A System Operator industry briefing was held at 11:00 to highlight the response requested from the industry, and directly contacted key participants to understand their planned response.

The response from industry was proactive and appropriate to the circumstances. However, following assessment of the risks to the forecast residual based on the 12:00 schedules, known plant risks and informed by a Metservice briefing that indicated demand was likely to be higher and wind lower than then forecast, Transpower published a media release and Facebook post. The messaging asked New Zealanders to stay warm but be mindful of their electricity use between 7am and 9am the next morning. Messaging was shared with retailers and lines companies to amplify to their customers, as practiced in the pan-industry exercise the previous day. We held another System Operator industry briefing at 15:30 to communicate our risk assessment, the rationale for the media release, and provide an opportunity for participants to seek clarifications.

On the evening of 9 May weed issues were reported at Tokaanu, requiring generation output to be significantly reduced throughout the night (as low as 20 MW). Work to address the issue through the night restored output to 150 MW by 23:00 and over the morning peak (90 MW less than originally offered). As the morning approached there were delays in getting Stratford generation to start, along with more energy/reserve shortfalls being seen in the

06:00 schedule. As a result, Whirinaki units 1, 2 and 3 were discretioned on at 18 MW each from 07:00 to cover the risk of further thermal startup or weed issues and to mitigate the Whirinaki units' ramp time.

A shortfall was avoided in real time thanks to a good response from industry and the public. We estimate consumers reduced demand across the morning peak by around 235MW, made up of roughly 175MW conforming load and 60MW industrial load. Later on 10 May we acknowledged the industry and consumer response through another media release. The events were covered extensively by media, and we appeared multiple times on live radio and television interviews to explain the situation.

A survey of communications leads following the event showed near unanimous support for our approach to messaging and our execution, although areas for improvement were identified and they have been incorporated into our planning for any similar future events.

Some participants wrote to the Authority and Transpower to seek further clarity over our approach to the events of 9 and 10 May including our public messaging. We met with the CE Forum and the Authority on 17 June. The discussion confirmed industry support for continuing with our approach to potential shortfalls and the risk assessment approach we used on 9 May. We confirmed our commitment to provide industry as much time as possible to solve the potential shortfall before we ask consumers to be mindful of electricity use as a last resort.

10 May evening peak - National reserve scarcity pricing: On Friday 10 May, during the evening peak three 5 minute periods were dispatched with reserve shortfall, resulting in reserve scarcity pricing. This reflected what the SPD algorithm determined to be the most economic outcome: energy and reserve offers were both used as energy, resulting in reserve scarcity (up to 34 MW) priced at \$3,000/MWh. The alternative option was to use the generation offers as reserve and procure more expensive energy (>\$5,000/MWh).

11-13 May - Grid emergency notice (GEN) for a G5 geomagnetic storm: A GEN was issued on 11 May because of a 'G5' extreme geomagnetic storm over the weekend of 11-13 May. To maintain operational security, in accordance with contingency plans to mitigate impacts of geomagnetic induced currents on the grid, the System Operator instructed transmission circuits to be removed from service. A System Operator Industry Briefing was held to inform stakeholders of the situation. Contingency plans, created in conjunction with advice from Professor Craig Rodger from Otago University, were applied to maintain security on the system; these plans had been tested as part of group training. This was the first 'G5' extreme storm to hit earth in decades and is at the lower end of the scale (10x less) of events which the Electrical Industry Space Weather Working Group is preparing for. There was no market impact and supply to consumers was not affected.

Following the event we have been collaborating and sharing our learnings with both local (GNS, NEMA, Solar Tsunami Project) and international (National Grid ESO, AEMO, TransGrid, UK Met Office) organisations considering the risk of geomagnetic storms. This has reinforced that we are leading the way in this field in terms of modelling and mitigations, but highlights as a country we lack the level of local hazard monitoring and advice the likes of Australia and the UK have.

Dispatching from backup tools: On 11 June we utilised stand-alone dispatch for a period of approximately 45 minutes as the result of a planned failover of the market system between data centres. On 19 June we used phone dispatch for about 20 minutes due to issues with the DICOM electronic dispatch system. The issue was caused by application monitoring taking a disproportionate amount of compute resources in that application to stall. Configuration changes were made at the time on the incident to prevent reoccurrence, these changes have now been made permanent after consultation with the application vendor.

Northland Loss of Supply: On Thursday, 20 June at 11:03 the Huapai_Marsden_1 220 kV circuit tripped. At that time, Bream Bay_Huapai_1 220 kV circuit, was out of service for planned maintenance and 110 kV system splits at Maungatapere were in place to mitigate potential overloading of the Henderson_Maungatapere 110 kV transmission circuits. Consequently, the trip resulted in a 159 MW loss of supply from Warkworth north. A grid emergency was declared at 11:17 by the system operator and remained in force until 16:00 on 23 June 2024. The cause of the incident was failure of Tower 130 on the Henderson-Marsden A transmission line, which resulted in an earth fault on the circuit that could not be cleared. Most supply was restored by Thursday afternoon, with full capacity restored Sunday afternoon once a replacement tower was erected. Full security of supply into Northland was restored on Wednesday 26 June after the installation of additional temporary structures for the second 220 kV circuit. Refer also to section 2 below.

Under-Frequency Event: On Thursday 27 June at 12:32, an under-frequency event occurred in the North Island when Huntly Unit 1 tripped. The North Island frequency reached 49.205Hz and as a result may not have triggered some of the interruptible load relays. We have requested data from contracted ancillary service agents and, once received, we will assess performance during the event to determine if actual performance was as expected. Based on our analysis we will provide information to participants outlining their response and any non-compliance.

2 Power systems investigations and reporting

Significant incident investigations

Northland Loss of Supply: A preliminary fact-based report for the incident has been published on the [Transpower website](#) in accordance with our agreed procedure with the Authority. A full investigation report by an independent investigator will be delivered within 90 business days of the incident.

Commissioning

Meridian BESS at Ruakaka: We continue to work with Meridian on the commissioning plan for its BESS.

Meridian generator upratings: Meridian has withdrawn its request for dispensations for Manapouri upratings, and indicated they plan to request dispensations for planned upratings at Ohau B and C.

Contact Tauhara Geothermal Station: Tauhara's 30-day reliability run was completed on 24th June. As part of final commissioning, Tauhara will run at 130-135MW over the next two months. Once complete Tauhara is expected to operate at 152MW until further modifications are undertaken, following which it is expected to achieve its long-term generation output

capacity of 174MW. We are also working with Contact on its Te Huka 3 geothermal plant, due for commissioning in September 2024.

Lauriston Solar Farm: We are working with Genesis on the modelling and the commissioning plan for their Solar Farm which will connect at Ashburton.

Aurora Energy: Aurora and Transpower (as grid owner) are in discussion about a future ICCP connection. In May Aurora had raised with us (as system operator) an interest in exploring other, future options for communicating TSO:DSO. A cross-Transpower (IST, Customer team, and System Operator) meeting was held on 14 June.

System Security Forecast (SSF)

We are completing the report on thermal and voltage limit analysis, the first deliverable of the refreshed System Security Forecast. The power system engineers have completed their analysis of the island 220 kV backbones and each grid zone, and we are completing the reports for publication during the next quarter.

3 Outage planning and coordination

Outage planning – near real time

- Planned outage numbers requested by the grid owner and other market participants are now low during the winter period.
- We have completed our assessment of the grid owner's 2024/25 annual outage plan which they published in advance of the 19 May regulatory requirement.

New Zealand Generation Balance (NZGB) analysis

NZGB Margins were low throughout May. The main reason for the low margins was a higher than normal level of generator outages being taken ahead of winter, coupled with rising demand through autumn. The low May margins resulted in numerous NZGB CANs being issued requesting that outages be moved. The industry responded to these requests by re-scheduling outages on those days. The margins improved in June despite higher demand, as the number of generation outages reduced considerably.

NZGB is showing potential shortfalls 12-31 July for N-1-G (N-1-G balance is the system's capacity to cover, over the peak, the loss of the largest risk-setter if the next largest risk setter were also to become unavailable. This is mainly due to an increased number of generation outages over that period, and peak winter demand. Industry has been notified of these potential shortfalls through a NZGB CAN and assessment (published 26 June) as well as through the fortnightly System Operator Industry Forum. In parallel, we are talking to individual generators that have outages starting during this period about outage flexibility and any potential recall times.

4 Commitment to the evolving industry needs

Winter 2024 readiness

Extended SO forum: On 9 April, we hosted an extended SO Industry Forum where we stepped industry through our approach to Winter 2024. This included what information is available to industry, operational notices, and response, as well as industry communications. The forum was well attended.

Transpower (as Grid Owner) discussion paper “Examining the purpose and future role of our HVDC link”: On 26 April, we provided [feedback](#) that we agree with the assessment of the increasing importance of the HVDC to the operation of the power system. We highlighted our unique insight into the operation of the HVDC as part of the wider electricity system and markets and signalled our intention to engage with the grid owner’s process. Transpower’s [summary of submissions](#) responds to our [submission](#).

2024 Pan-industry exercise: On 1 and 8 May 2024 the Electricity Authority and System Operator held two industry exercises covering a major power system event. Day 1, led by the System Operator, was for control room operators to test grid emergency processes and interactions between the System Operator and generators, lines companies and direct connect industrial customers. Day 2 was for communications and customer teams and was led by the Electricity Authority alongside Transpower’s communication team. It tested communications and interactions from Transpower out through lines companies and retailers to end consumers.

With winter approaching rapidly, it was good timing to have key people from most of the country’s generators and local lines companies registered to take part, alongside some of the major industrial customers that connect directly to the national transmission grid. Day 1 provided an important opportunity to remind industry of improved information resources and processes for identifying and managing potential electricity supply shortfalls, put them to the test, and look for opportunities for further improvement. Meanwhile, Day 2 helped socialise a pan-industry approach to communicating with consumers (and the media) about any risk to their electricity supply and what the industry is doing to minimise the impact and keep the power flowing.

The exercise meant the industry was well-prepared to successfully manage the potential electricity shortfall on the morning of 10 May when industry and consumers were asked to conserve electricity on what was the coldest morning of the year to support the operational response. We are in the process of documenting the lessons learnt from Day 1 for sharing with participants.

MetService daily briefings: MetService informed us it expected May to be colder than the past five years with potential for more intense sharp cold snaps - due in part to colder ocean temperatures. Consequently, we began daily MetService briefings from 1 May this year (a month ahead of plan). The briefings occur each weekday with an in depth 48-hour look ahead, and an overview of further ahead. They help us better understand the weather risk to peak load and wind generation forecasts to help manage tight situations. Notably, the daily briefing we received on 9 May informed our risk assessment of the 10 May morning peak, correctly identifying that temperatures were likely to be lower than forecast on 9 May.

Week-ahead dispatch schedule (WDS) offers: The WDS schedule provides the System Operator and market participants with information about potential security issues and forecast price signals up to seven days into the future. The accuracy of the schedule is only as good as the information that is provided to us. While generators have improved the quality of offers into the WDS there remains room for improvement. We raised the importance of market participants providing accurate, up-to-date information in our [Winter](#)

[2024 Outlook paper](#) and our 9 April extended [System Operator Industry Forum](#) when we outlined our approach to winter. Participants sought further clarity of what good looked like for the System Operator. We have drafted a note in response to that request, which is available on our [website](#).

System Operator Rolling Outage Plan (SOROP) review: On 31 May we submitted our [proposal](#) (including our response to feedback received from stakeholders) to the Authority for its consideration. . We are preparing to implement a new SOROP which will include modelling, working with distributors and direct connects to update their participant rolling outage plans (PROPs), and procedure updates.

AEMO and Transgrid visit: A small contingent of our leadership team visited AEMO and TransGrid during June. The trip was an opportunity to see their control room operations first hand, discuss a range of common topics (control room operations/staffing, technology and tool development, training, outage management and challenges/opportunities associated with the transition) and build stronger connections to enable future sharing and collaboration.

Security of Supply

Security of Supply Assessment (SOSA) 2024: The Security of Supply Assessment 2024 final report was [published](#) on 26 June. South Island Winter Energy Margin (SIWEM) has worsened relative to last year's SOSA due to an increased South Island energy demand forecast. Both the New Zealand Winter Energy Margin (NZWEM) and the North Island Winter Capacity Margin (NIWCM) have improved due to a reduced demand forecast and an increase in the existing and committed generation pipeline.

Connecting with the industry

Participant survey: Our annual System Operator participant survey closed on 31 May. Despite repeated attempts through different channels to proactively seek engagement, the response was smaller than expected. The survey is an important way for us to understand how our stakeholder's regard our service and we will explore what we can do to get a better response in future.

Weekly Market Movements: Every Tuesday we publish a Market Operations weekly report on our website (or via email to subscribers) containing the latest information about the electricity market, including security of supply, wholesale price trends and system capacity. The report also contains an insight on a topical item for that week. The following insights were provided this quarter (the report date refers to the week ending date):

- [7 April](#): An overview of the market schedules which inform the System Operator's security assessments and provide information to market participants from a week-ahead down to real-time.
- [14 April](#): Key changes to the updated Electricity Risk Curves 101 document, including a link to a video introducing the various concepts and modelling assumptions.
- [21 April](#): How the recent hydro inflow event compares to previous large inflow events.
- [28 April](#): The growth of wind turbines and wind farms.

- [5 May](#): The generation variability of wind and solar farms.
- [12 May](#): A cold snap during the week resulted in some very tight capacity margins with a warning notice (WRN) issued for a potential electricity shortage on Friday morning.
- [19 May](#): Transpower's response to the geomagnetic storms earlier this month.
- [26 May](#): The average household electricity consumption, and the corresponding impacts of power black outs.
- [2 June](#): Residual and energy shortfall are two measures of the sufficiency of generation to meet demand in the wholesale electricity market. Residual is a measure of physical capability while energy shortfall is an economic measure.
- [9 June](#): An exploration of New Zealand’s history of developments in geothermal energy, underscoring its pivotal role and future prospects.
- [16 June](#): Reserve scheduling and dispatch after an under frequency event.
- [23 June](#): An overview of a load duration curve showing demand from the whole of 2023. The load duration curve consists of the average load per trading period across the year, ordered from highest to lowest.
- [30 June](#): A summary of the 2024 Security of Supply Assessment (SOSA) published on 26 June.

Supporting the Authority

During June we held the fourth quarterly brainstorm workshop with the Authority (consistent with our key performance indicators), which covered a look-forward at the FY25 work programme components that will require System Operator support including the Future Security and Resilience programme.

Media interactions

Date	Outlet/type of engagement	Details	Coverage
2 April	Energy News	Asked to do an exit interview with Alison Andrew. Interview was coordinated and appeared on 20 June.	Exit interview
3 April	News From Transpower	Included Alison Andrew resignation; preparation for winter; sign up reminder for winter exercise with Authority; and System Operator participant survey reminder.	
10 April	TVNZ	Asked for an interview about a tight winter after reporter Jessica Roden OIA'd Minister Brown for briefings about the issue. Reporter was briefed but chose to interview MEUG and Octopus Energy as well as the Minister for story.	Report
15 April	NZ Herald	Request for interview about a tight winter ahead. Statement provided.	Report

Date	Outlet/type of engagement	Details	Coverage
16 April	Energy News	Questions about an under-frequency event linked to Genesis Rankine unit. Information on process provided.	Report
24 April	Listener	Questions about state of NZ power system from freelance writer Richard Woodd. Statement provided. Reporter said story angle changed from “system in crisis” to “system facing shared challenges” following statement so editors cancelled the story.	No story
29 April	Media release Linked In post	Red Hat, a provider of open-source solutions, has recognised Transpower as a Red Hat Innovation Award winner for a multi-year programme that included the delivery of the biggest change to the wholesale electricity market since it was created in 1996. The launch of real-time pricing in late 2022 was the culmination of a complex ten-year programme to modernise the market system and enable rapidly evolving technologies like battery storage and smart appliances that depend on more accurate and timely prices.	Red Hat announcement Reseller News Channel Life
3 May	News From Transpower	Included winter exercises with Authority; consultation on draft Security of Supply Assessment, AUFLS transition; and addition of wind risk feature to em6 residual graph.	
7 May	RNZ	Reporter Tim Brown did extensive and wide-ranging interview with Chantelle Bramley about system operator and winter tightness.	No story published – potentially superseded by averted shortfall on 9 and 10 May
9 May	Multiple outlets with at least 54 calls and emails	Transpower calls for public to be mindful of electricity use between 7am and 9am on Friday 10 May to help avoid a potential electricity supply shortfall. Media release , plus Facebook post, plus we escalated messaging to public with help of industry	Significant coverage across all major news organisation – including live blogs – and unprecedented level of Facebook interactions. Included a live interview on RNZ Checkpoint and

Date	Outlet/type of engagement	Details	Coverage
		participants via the Major Power System Event Contact List process.	Newstalk ZB's drivetime show, plus interviews on camera for One News and Newshub/TV3
10 May	Multiple outlets with at least 28 calls and emails.	Multiple media appearances ahead of the morning demand peak and ongoing liaison with all major outlets throughout the morning. Media release and Facebook post at 10am thanking public and industry for actions to prevent potential shortfall.	Significant coverage across all major news organisation – including live blogs – and unprecedented level of Facebook interactions. Included a live interview on RNZ and Newstalk ZB morning shows as well as live appearances on breakfast shows on TVNZ and Newshub/TV3.
11-13 May	Multiple outlets	Media release and ongoing coverage of solar storm grid emergency from early on 11 May to 13 May when grid emergency ended	Significant coverage across all media outlets including interviews on camera and radio
20 May	RNZ	Questions about potential shortfall for 23 May identified in NZGB CAN in late April. NZGB system explained to reporter including how market schedules give a more accurate picture of tight supply within 7 days and we will go public if there is any risk to electricity supply.	No story.
31 May	TVNZ	Proactive approach to do a story on how NCC and wider System Operator work to keep the lights on over winter.	Report
4 June	Media release	John Clarke announced as Acting CE	Energy News
4 June	News From Transpower	Included a review of the space weather event; an update to the NZGB planning tool; and Security of Supply Assessment consultation closed.	
5 June	Sunday Star Times	Impact of data centres on future load modelling and on tight winters now. Response provided from	Report

Date	Outlet/type of engagement	Details	Coverage
		System Operator as well as grid owner.	
5 June	The Monthly (Australian publication)	Questions about modelling of space weather impact on power system. Referred to Professor Craig Rodger in first instance.	No story has appeared.
7 June	Southland Express	Impact on power system of Tiwai staying open. Comprehensive statement provided.	Editorial
15 June	NZ Herald	Comment on data centre growth and impact on power system	Report
18 June	Energy News	Comment and data on increased May demand.	Report
20 June - ongoing	Multiple outlets	<p>Northland Tower - significant ongoing coverage of collapse of tower supplying Northland and Auckland north of Warkworth.</p> <p>Our media releases:</p> <p>20 June 11.45am – Northland without power after fault</p> <p>20 June 2.30pm – Update on Northland power outage</p> <p>20 June 5.30pm – Update on Northland power cuts</p> <p>21 June 7.30am – Full restoration of power to Northland expected over weekend</p> <p>22 June 6.15pm – Update on tower replacement to restore 22 kV transmission line into Northland</p> <p>23 June 1.35pm – Momentary power losses possible to some areas of Northland as Transpower re-livens 220 kV circuit</p> <p>23 June 3.05pm – Transpower completes temporary tower replacement to restore further Northland electricity capacity</p> <p>24 June 1.30pm – Statement from Transpower Chief Executive about cause</p> <p>26 June 6.40pm - Transpower restores second 220 kV circuit into Northland</p>	<p>Multiple reports that are ongoing.</p> <p>Appeared on TVNZ and Newshub/TV3 as well as RNZ and Newstalk ZB in immediate aftermath, plus held a media standup to provide details of cause on Monday 24 June.</p> <p>Most coverage around grid owner side but there was also coverage of System Operator actions to reconfigure 110 kV circuits in the immediate aftermath and re-liven the 220 kV circuits.</p>

Date	Outlet/type of engagement	Details	Coverage
26 June	Stuff	Asked if NZGB CAN released is worth reporting on. Explained the use of the NZGB as a planning tool and that we will proactively communicate any risk to power supply.	No story
27 June	Energy News	Comment on NZGB CAN and winter margins	Report

5 Project updates

5.1 Market design and service enhancement project updates

Progress against high value, in-flight market design, service enhancement and service maintenance projects are included below along with details of any variances from the current capex plan.

Future Security and Resilience (FSR) Programme

We addressed the Common Quality Technical Group (CQTG) comments in the drafts of our FSR technical reports. Under the FSR Technical Advisory Service (TAS) contract, we have delivered reports to the Authority on voltage and frequency issues. These have been published alongside the Authority’s consultation papers on the Part 8 Common Quality review. We have also agreed the high-level scope of FSR programme work for the 24/25 financial year. We have continued to support the Common Quality Technical Group which met in June to discuss the Authority’s Code Amendment Proposals.

Extended Reserves – Automatic Under-Frequency Load Shedding (AUFLS) project

In late June, the SO hosted the second AUFLS transition industry session. During the session the AUFLS transition team provided a general update on progress and shared the improvements to the lessons learnt from previous quarter. Also, the team presented a deep dive into the monthly studies the team performs and the importance of the annual submission process to the study work. The slide pack has been made available on the Transpower website: [AUFLS Transition Quarterly Session - June 2024](#)

5.2 Other projects and initiatives

System Operator Service Provider Agreement (SOSPA) contract reset

We have had ongoing meetings between the SOSPA working group and Authority representatives to agree several elements of the SOSPA contract ahead of formal negotiations in July. The Initial Proposal was delivered to the Authority on 1 July. We expect to provide a Final Proposal to the Authority at the start of September after Transpower Board approval late August.

Operational Excellence

Over the quarter we have progressed the competency development framework for NCC to a point where we are now rolling out to the coordinators for initial assessment, with ongoing embedment passed over from the programme to the business. With this a vast majority of what the Operational Excellence programme set out to achieve has been completed, including improvements to process management and access, tool defect and enhancement management, and workforce planning. As per the original project plan, we have been focusing during June to close the programme down and transition the remaining elements into the business for ongoing embedment. On that basis this will be our last update on the Operational Excellence Programme.

Outage Handling and Management System (OHMS)

Development, testing and delivery of features related to Outage Block and Outage Window functionality are in progress. Service providers and subject matter experts from across the business are involved in regular product reviews. A quarterly product review for key stakeholders is planned for August.

New Zealand Generation Balance (NZGB) forecast update

We successfully released the latest version of the New Zealand Generation Balance (NZGB) on 26 June. The update changes a forecast reflecting historical demand plus a static demand growth assumption, to a probabilistic based demand forecast provided by Yes Energy (formerly Tesla) forecasting services. While the demand forecast is being implemented, we will also simplify the supply side scenarios and review the messaging in NZGB reports to the market. This initiative is on track to take effect in NZGB reporting from 1 July, with the new forecast reflected in calculations for 1 August onwards. We hosted an industry engagement session on 12 June for comments and feedback this can be found on the [webinars page](#) of our website.

6 Technical advisory hours and services

The following table provides the technical advisory hours for Q4 2023/24 and a summary of technical advisory services to which those hours related (SOSPA 12.3 (d) refers).

TAS Statement of Work (SOW)	Status	Hours worked during Q4
TAS106 – FSR Workstream	Closed	336
TAS 108 – Extended Implementation (Phase III)	In progress	258
TAS 109 – Instantaneous Reserves Cost Allocation	In progress	223
TAS 110 – Winter 2023 Options	Closed	176

7 Risk & Assurance

Risk Management

Our six-monthly review of half our critical controls is complete.

Business assurance audits

The final two Business Assurance Audits for 2023/24 were completed this quarter:

- Synchronise and Reconnect an Island
- Shortage of Supply Management

The Business Assurance Audit Plan 2024/25 has been agreed with the Authority.

8 Compliance

We reported no system operator self-breaches in this reporting period.

9 Impartiality of Transpower roles

We have two open items in the Conflict of Interest Register (below). These are being actively managed in accordance with our Conflict of Interest procedure.

System Operator Open Conflict of Interest Issues		
ID	Title	Managed by
40	General System Operator/Grid Owner dual roles: This is a general item that will remain permanently open to cover all employees with a dual system operator/grid owner role. The item documents the actions necessary to ensure impartiality in these circumstances; these items will be monitored to ensure their continue effectiveness.	Corporate Counsel, Compliance, and Impartiality
41	General relationship situation: This is a general item that will remain permanently open to cover all potential conflicts of interest arising under a relationship situation. This item documents the actions necessary to prevent an actual conflict arising and will be monitored by the Corporate Counsel, Compliance, and Impartiality to ensure their continued effectiveness.	Corporate Counsel, Compliance, and Impartiality

10 Performance metrics and monitoring

The following dashboard shows System Operator performance against the performance metrics for the financial year required by SOSPA 12.3 (a). Only those metrics with weighting are used in the calculation of the System Operator score and incentive payment.

The current performance metrics will be revised with minor changes for the 2024/25 reporting year.

TRANSPower		TRANSPower // SYSTEM OPERATOR	
New security and reliability risks are identified and appropriately managed	O1 Score 2.89	Financial Year FY 2023/24	
Significant events are appropriately scoped, understood, prepared for and managed	O2 Score 3.15	Quarter All	
The Authority is supported to evolve and develop the electricity market and power systems	O3 Score 3.99		Overall Outcome Score
Relevant market information is made accessible to stakeholders	O4 Score 4.38		3.69
Stakeholders are effectively informed on and included in decisions where relevant	O5 Score 4.21		Performance % Score
Stakeholders are satisfied with our service	O6 Score 4.58		77%
SOSPA delivery provides value	O7 Score 4.20		

10.1 SOSPA and Code annual deliverables

All end of year SOSPA deliverables were delivered on time, as follows:

- SO strategic plan
- Capex roadmap
- Capex plan
- SO/ICT roadmap
- Performance metrics and incentives agreement
- Business assurance audit plan
- Completion of current year’s business assurance audits (up to 5 a year)
- Education and engagement plan
- Statutory objective work plan
- Business plan
- Participant survey

11 Cost of services reporting

The cost of services reporting for 2022/23 was delivered on 5 July 2024.

12 Actions taken

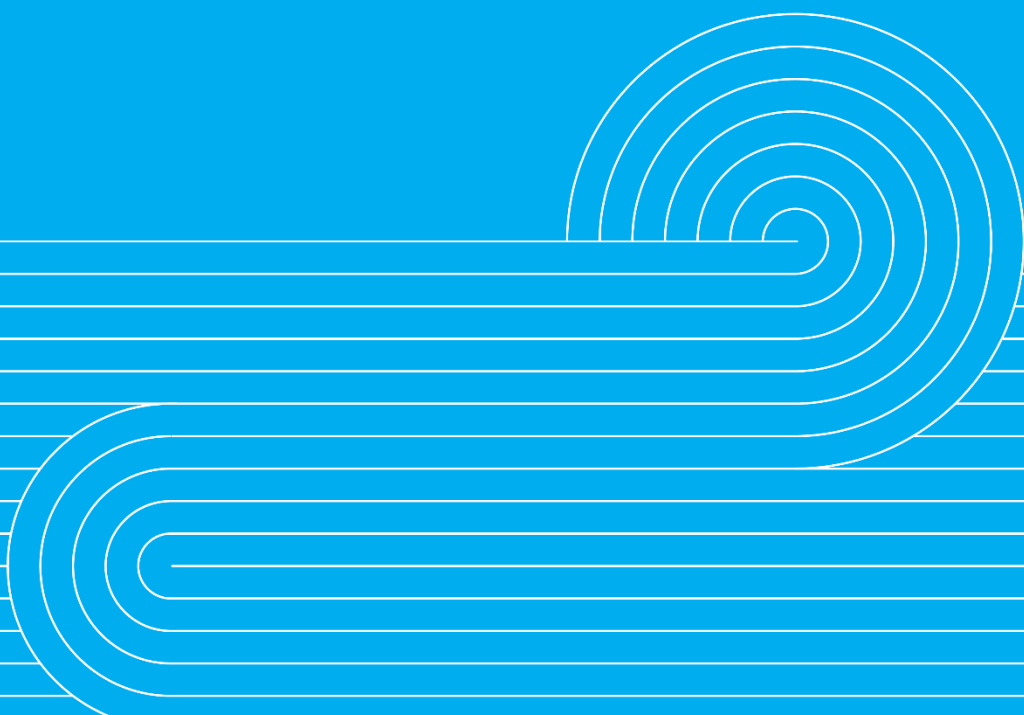
The following table contains a full list of actions taken during Q4 2023/24 regarding the System Operator business plan, statutory objective work plan, participant survey responses and any remedial plan, as required by SOSPA 12.3 (b).

Item of interest	Actions taken
(i) To give effect to the System Operator business plan:	<ul style="list-style-type: none"> • Plan the activities and themes to support the SOSPA3 reset process. <i>The SOSPA3 proposal was delivered to the Authority on 1 July, ahead of formal negotiations.</i>

Item of interest	Actions taken
	<ul style="list-style-type: none"> • New performance metrics agreed with the Authority are operationalised and matured. <i>Performance measures with the Authority have been agreed for with minor adjustments for the 24/25 financial year.</i>
(ii) To comply with the statutory objective work plan:	<ul style="list-style-type: none"> • Review the current scope and timing of SOSPA deliverables. <i>This has been one of the workstreams in the SOSPA3 negotiations. With a nearer term focus, we have added a commitment as part of our performance metrics for the 24/25 year to enhance the accessibility of existing content and provide value-add content of key document.</i>
(iii) In response to participant responses to any participant survey:	<p>Feedback from the 2022-23 survey</p> <ul style="list-style-type: none"> • Clarification of the scope and boundaries with regards to distributed generation and DERs embedded within distribution networks. <i>We're members of the Electricity Networks Aotearoa (ENA) Future Networks Forum (FNF) and FlexForum and continue to hear those concerns through those forums. We are engaging with distributors through the FNF to clarify our position which addresses the concerns raised in this feedback. Additionally, we are engaging with:</i> <ul style="list-style-type: none"> ○ <i>distributors around 2-way data sharing to improve visibility for both SO and distributor,</i> ○ <i>the FNF Roles and Functions workstream,</i> ○ <i>The Authority's FSO workstream, and</i> ○ <i>The Authority's distribution reform workstream.</i> • There is still opportunities to improve communication. This is particularly true during times of power or energy shortage. <i>We recognise the need for good communication and the importance of keeping industry participants informed. Within the last 2 months there have been three major events, we have carried out the following to keep the industry informed:</i> <ul style="list-style-type: none"> • <i>9/10 May a Warning notice (WRN) was issued. Reserves shortfall in the 10:00 schedules triggered a WRN to be issued at 10:51, a System Operator industry briefing was held at 11:00. We used the Major Power System Event Contact List to invite people from industry outside control rooms to the industry briefing and to help ask consumers to be mindful of electricity use.</i> • <i>11 May Grid emergency notice (GEN) was issued for a G5 geomagnetic storm and a System Operator Industry Briefing was held to inform stakeholders of the situation. We also used the Major Power System Event Contact List to communicate widely across industry and invited NEMA to our industry briefing.</i> • <i>20 June during the Northland Loss of Supply event a conference call with EDB operations managers was organised to align on status and any required actions as part of the event.</i>

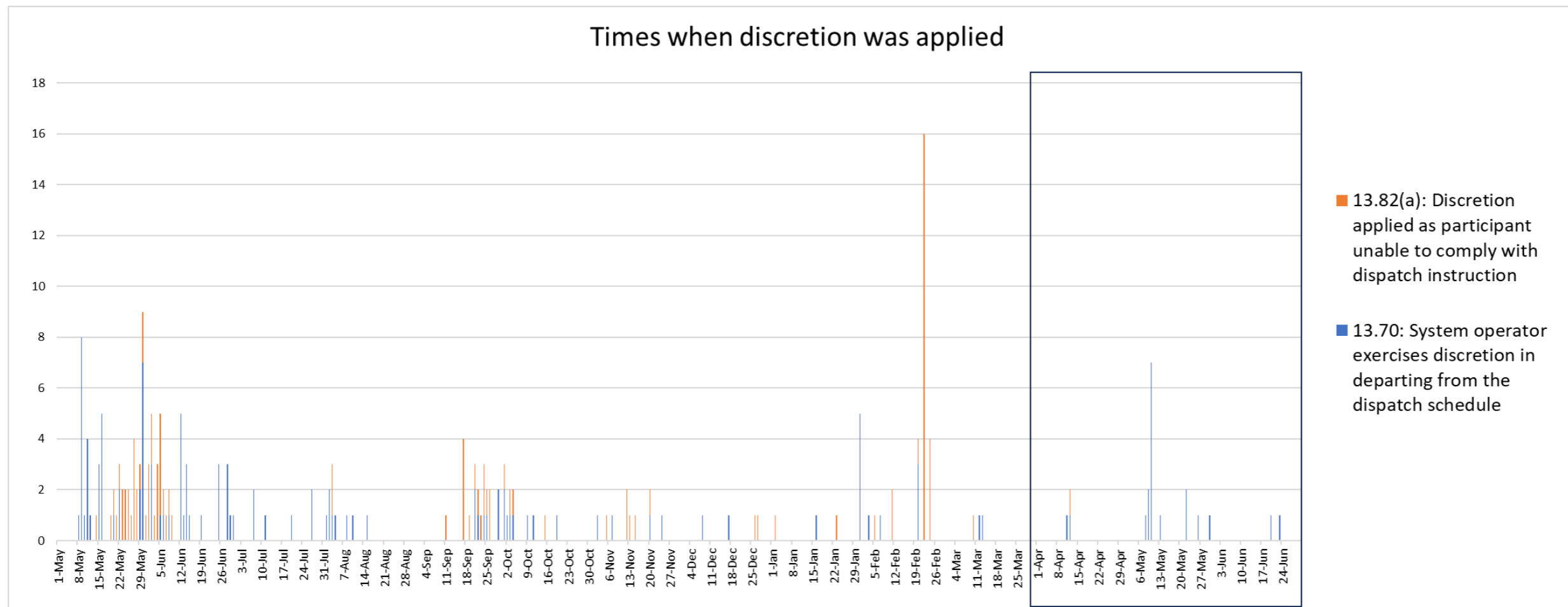
Item of interest	Actions taken
(iv) To comply with any remedial plan agreed by the parties under SOSPA 14.1	N/A – No remedial plan in place.

Appendices



Appendix A: Discretion

The graph below shows all instances of discretion application with a summary beneath of the individual instances of application.



April – 3 instances

2 were applied in response to discretion clause 13.70

- 11 April – Discretion at Huntly was applied but not sent as electronic bona fide change came through in time for next 5 minute dispatch.
- 12 April – Discretionary constraint 311 MW max applied to Manapouri to provide capacity for reduction line restoration.

1 was applied in response to discretion clause 13.82(a)

- 12 April – Nga Awa Purua (NAP) scheduled below minimum of 143MW. Least cost solution was to keep NAP on.

May – 15 instances

15 were applied in response to discretion clause 13.70

- 9 & 10 May – At Whirinaki there were 9 instances where discretion was applied, when the units were dispatched above their minimum MW generation requirement. This ensures the units remained on and generated over in the evening peak when their generation was required for security of supply purposes due to low residual generation.
- 10 May – Huntly unit 6 was dispatched above its minimum MW generation requirement to ensure it remained on and generated over in the evening peak when its generation was required for security of supply purposes.
- May – Argyle generation was discretioned down to 0 MW to enable the start of an outage that required the Argyle to Blenheim outage.
- 22, 26 & 30 May – Manapouri was discretioned down to allow for an extended potline outage due to low residual generation.

June – 2 instances

2 were applied in response to discretion clause 13.70

- 20 June – Discretion was applied in response to the loss of power in Northland.
- 23 June - Discretion was applied in response for the restoration of Bream Bay to Huapai.

Appendix B: Performance Metrics

Scoring

Q4 scores are shown as shaded cells in the figure below.

Performance metric scores as at June		Score out of 5					N/A	Comment
Metric	Definition	1	2	3	4	5		
PM1	Risk register has been updated and tested externally with the Authority and widely among industry participants	Internal Risk Register has not been updated in the last 12 months, no engagements have been held to identify new threats or assess current threats	Internal Risk Register has been reviewed and updated internally in the last 12 months	Internal Risk Register has been reviewed and updated internally in the last 6 months	An annual workshop is held with the Authority, OR representatives from a diverse range of stakeholders, to review threats and identify and assess new security and reliability threats	An annual workshop is held with each of the Authority, AND representatives from a diverse range of stakeholders, to review threats and identify and assess new security and reliability threats		Risk register reviewed in November 2023 and June 2024
PM2	% of SMART actions from the control self-assessment with maturity ratings of 1 or 2 will be addressed by the planned due date	< 50% of SMART actions with a maturity rating of 1 and 2 are completed by due date	≥ 50% of SMART actions with a maturity rating of 1 and 2 are completed by due date	≥ 75% of SMART actions with a maturity rating of 1 and 2 are completed by due date	100% of SMART actions with a maturity rating of 1 and ≥ 75% of SMART actions with a maturity rating of 2 are completed by due date	100% of SMART actions with a maturity rating of 1 and 2 are completed by due date		This score is impacted by two actions allocated prior to staff change. We have resolved both actions and will discuss the impact of the scoring at the end-of-year review conversation There are 7 actions due at the end of the financial year - 2 have been moved into the next financial year, 2 are likely to be completed in time and the remaining 3 require an update
PM3	At least one pan-industry event exercise held to test existing controls	-	-	0 pan-industry event exercises	1 pan-industry event exercise	2 event exercises (1 of which must be a pan-industry exercise) – includes smaller event exercises with industry involvement		The pan-industry exercise which we are leading took place on 1 May (and we contributed to the Authority-led exercise on 8 May) The Black Start simulation exercise is an example of a smaller event exercise with industry involvement
PM4	% of actions from industry exercises which were completed on time	< 50 %	≥ 50 % and < 65 %	≥ 65 % and < 75 %	≥ 75 % and < 100 %	100%		There are currently no actions
PM5	Average score of internal process assessments arising from significant events	Poor	Below Expectations	Acceptable	Good	Excellent		There are no internal process assessments
PM6	Percentage of actions from significant events which are closed on time	< 50 %	≥ 50 % and < 65 %	≥ 65 % and < 75 %	≥ 75 % and < 100 %	100%		2 of the 4 actions due at the end of 2023 were not completed to schedule. And the 4 scheduled for completion at the end of June are unlikely to all be completed in time.
PM7	On time delivery of significant event reports	Less than 100% of major preliminary reports delivered on time	All major preliminary reports and 60% of other reports delivered on time	All major preliminary reports and 80% of other reports delivered on time	100% of all reports delivered on time	Score not available		There are no significant event reports
PM8	Average satisfaction score from stakeholders, as per responses received to transactional surveys taken at forums and asked for in correspondence	< 35 %	≥ 35 % and < 50 %	≥ 50 % and < 70 %	≥ 70 % and < 85 %	≥ 85 %		The responses to the Market Matters weekly update have been very positive and provided good feedback. Getting good feedback from Industry forum - but enthusiasm has dulled a bit since the beginning
PM9	All categories of stakeholders are actively engaged by the system operator throughout the year	SO Annual Participant Survey is not sent to a diverse range of stakeholders	SO Annual Participant Survey sent to a diverse range of stakeholders to request their feedback on how well they believe market information has been made accessible to them	Responses are received from a diverse range of stakeholders and are considered by the SO for improvement of engagement activities	Specific action is taken to build engagement from a diverse range of stakeholders	More than one action is taken as a result of feedback received from the Annual Participant Survey or other industry mechanisms and forums, with the aims of improving engagement with stakeholders		The annual participant survey sent to a wide-variety of organisations with 20 responses Deadline for completion is now end of May
PM10	% of industry submissions, made in response to system operator consultations, which are responded to	Not all submissions acknowledged	All submissions acknowledged and < 50% responded to	All submissions acknowledged and ≥ 50 % responded to	All submissions acknowledged and ≥ 75 % responded to	All submissions acknowledged and ≥ 90 % responded to		We have acknowledged and responded to 4 earlier consultations. We have answered questions arising from the submissions and cross-submissions on the proposed SOROP changes consultation - a final response requires feedback from the Authority
PM11	Stakeholder engagement in project delivery	The stakeholder engagement planning process is not undertaken during the year – ie no list of suitable projects and target list of stakeholder engagement is created	A list of suitable projects and target list of stakeholder engagement is created	The consultation process for the projects is carried out	Stakeholder engagement is actively monitored and managed throughout the year	Stakeholder input is incorporated into the process		The list of projects has been provided to the Authority and of the 6 identified only two have reached the stage for stakeholder input, which has been provided in each of these.
PM12	Average satisfaction score from stakeholders from Annual Survey	< 73 %	≥ 73 % and < 76 %	≥ 76 % and < 80 %	≥ 80 % and < 83 %	≥ 83 %		Received 100%
PM13	Average score from stakeholders on their perception of SO impartiality	< 60 %	≥ 60 % and < 65 %	≥ 65 % and < 75 %	≥ 75 % and < 80 %	≥ 80 %		Received 84%
PM14	Number of thought leadership publications on specific areas of system operator work that affect and/or are of interest to the industry	Score not available	No thought leadership publications in the financial year	1-2 thought leadership publications in the financial year	3-4 thought leadership publications in the financial year	>4 thought leadership publications in the financial year		3 thought pieces were delivered
PM15	Active contribution by the SO to Authority led-forums and consultations; and industry-led consultations	SO does not respond to any consultations and forums advised by the Authority as requiring system operator response	SO does not respond to all consultations and forums advised by the Authority as requiring system response	All Authority consultations and forums advised as requiring SO response are responded to	And some industry-led consultations responded to	And some industry-led forums contributed to		We have responded to 7 Authority consultations (inc all 4 on the list of required responses) and 5 industry consultations. Several Authority projects have been pushed into the next financial year
PM16	# of SO Industry Forums held	Score not available	1-10 forums	11-19 forums	20 or more forums	20 or more forums, plus 1 longer format forum		These are being held every fortnight and we have reached the 20 or more forums target as well as holding a longer industry forum on winter preparedness
PM17	% of key SOSPA documents delivered on time to the Authority	< 70%	≥ 70 % and < 100%	100%	Score not available	Score not available		All documents delivered as agreed, with any changes to the current SOSPA targets agreed by the parties ahead of time
PM18	Quarterly update/challenge/brainstorm sessions	0 sessions	1-2 quarterly sessions	3 quarterly sessions	4 quarterly sessions	Score not available		All 4 sessions have taken place

Appendix B (cont): Performance Metrics

Relationship between performance metrics and outcomes

These relationships explain why some performance metrics have a greater influence on the outcomes than others.

Note: Where the score of the performance metric is currently N/A, that performance metric does not contribute to the outcome or overall score

Performance metric ref	Metric	O 1: New security and reliability risks are identified and appropriately managed	O 2: Significant events are appropriately scoped, understood, prepared for and managed	O 3: The Authority is supported to evolve and develop the electricity market and power systems	O 4: Relevant market information is made accessible to stakeholders	O 5: Stakeholders are effectively informed on and included in decisions where relevant	O 6: Stakeholders are satisfied with our service	O 7: SOSPA delivery provides value	PM contribution to overall outcome score
PM 1	Risk register has been updated and tested externally with the Authority and widely among industry participants	22%	15%	8%	7%	8%	0%	0%	11%
PM 2	% of SMART actions from the control self-assessment with maturity ratings of 1 or 2 will be addressed by the planned due date	22%	15%	0%	0%	0%	0%	0%	8%
PM 3	At least one pan-industry event exercise held to test existing controls	11%	28%	8%	7%	0%	0%	10%	12%
PM 4	% of actions from industry exercises which were completed on time	0%	0%	0%	0%	0%	0%	0%	0%
PM 5	Average score of internal process assessments arising from significant events	0%	0%	0%	0%	0%	0%	0%	0%
PM 6	Percentage of actions from significant events which are closed on time	11%	28%	8%	0%	0%	0%	0%	11%
PM 7	On time delivery of significant event reports	0%	0%	0%	0%	0%	0%	0%	0%
PM 8	Average satisfaction score from stakeholders, as per responses received to transactional surveys taken at forums and asked for in correspondence	0%	0%	0%	14%	8%	67%	10%	9%
PM 9	All categories of stakeholders are actively engaged by the system operator throughout the year	11%	0%	8%	14%	17%	33%	10%	11%
PM 10	% of industry submissions, made in response to system operator consultations, which are responded to	0%	0%	8%	14%	17%	0%	20%	6%
PM 11	Stakeholder engagement in project delivery	0%	0%	8%	7%	17%	0%	0%	4%
PM 12	Average satisfaction score from stakeholders from Annual Survey	0%	0%	0%	0%	0%	0%	0%	0%
PM 13	Average score from stakeholders on their perception of SO impartiality	0%	0%	0%	0%	0%	0%	0%	0%
PM 14	Number of thought leadership publications on specific areas of system operator work that affect and/or are of interest to the industry	11%	0%	15%	14%	8%	0%	0%	7%
PM 15	Active contribution by the SO to Authority led-forums and consultations; and industry-led consultations	0%	0%	15%	7%	0%	0%	0%	4%
PM 16	# of SO Industry Forums held	0%	15%	8%	14%	17%	0%	20%	9%
PM 17	% of key SOSPA documents delivered on time to the Authority	0%	0%	0%	0%	8%	0%	20%	2%
PM 18	Quarterly update/challenge/brainstorm sessions	11%	0%	15%	0%	0%	0%	10%	6%
TOTAL		100%	100%	100%	100%	100%	100%	100%	100%
Outcome weighting to overall outcome score		20%	25%	20%	10%	10%	10%	5%	