MONTHLY SYSTEM OPERATOR AND SYSTEM PERFORMANCE REPORT

FOR THE ELECTRICITY AUTHORITY

Transpower New Zealand Limited

July 2020

Keeping the energy flowing

Transpower New Zealand Limited The National Grid

Report Purpose

This report is Transpower's review of its performance as system operator for July 2020, in accordance with clause 3.14 of the Electricity Industry Participation Code 2010 (the Code).

A detailed system performance report (Code obligated) is provided for the information of the Electricity Authority (Authority).

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System operator performance

1 Highlights this month

- We held a workshop on Security of Supply on 28 July. It was well received; we obtained some good feedback and were provided with some useful insights into gas supply considerations.
- Real Time Pricing (RTP) has now completed the capital investigation phase with the Delivery business case submitted to the Authority on July 10 as planned.
- The Market System (MS) Simplification project successfully commissioned non-functional changes into Market System in late July upgrading base code from Sequel to Java.
- We gave a presentation on the sensitivities schedule tool to the Authority in July and it was launched on Transpower's website in early August.
- A TAS statement of work is now underway to modify of a copy of vSPD to reflect the changes to be implemented under the RTP project, specifically the functionality required for scarcity pricing and outage infeasibilities.
- The system operator response to the Planned Outage Co-ordination Process (POCP) review has been published on our website, along with additional user information for POCP users.
- Analysis work for the major two-yearly System Security Forecast (SSF) commenced this month.
- Following the announcement by NZAS of the plan to not renew the supply contract with Meridian and to exit Tiwai, we have set up a working group to undertake a preliminary assessment of the potential impacts on the power system and market.
- We reinitiated the system operator incident management team in response to the elevated COVID-19 alert levels announced on 11 August.

2 Customers and other relationships

SOSPA 2 reset

We continue to work with the Authority on the proposal and have already reached agreement on a number of non-financial matters. We have scheduled weekly meetings until the end of September, but at this stage expect the negotiations may be completed earlier.

Security of supply workshop

We held a workshop on Security of Supply on 28 July. We received some useful insights into gas supply considerations, especially if Methanex were to shut as its impact on gas infrastructure could be as large as the impact of Tiwai closure on the electricity system.

3 Risk & Assurance

COVID-19 response

A workshop was held with the Operations COVID-19 incident management team to capture lessons from the pandemic experience so far. These will go towards improving our business continuity planning preparedness and coordination between Enterprise and divisional responses.

We reinitiated the system operator incident management team in response to the elevated COVID-19 alert levels announced on 11 August. We implemented our control room lockdown protocols across all our control rooms, including restricted entry to the control rooms and surrounding areas. Our Transpower Auckland office is closed and staff are working from home; all other Transpower offices are open.

Tiwai exit announcement

Following the announcement by NZAS of the plan to not renew the supply contract with Meridian and to exit Tiwai, we have set up a working group to undertake a preliminary assessment of the potential impacts on the power system and market. We are developing a list of considerations and reviews that will be prioritised and worked through as more information becomes known.

Business process audits

The scope for the first of the 2020/21 SOSPA Business Assurance Audits is being developed. This audit will be on managing insufficient generation offers and reserve deficits.

4 Compliance

We did not report any system operator breaches to the Authority in July.

We have six outstanding breaches with the Authority compliance team.

Appendix A shows instances where the system operator has applied discretion under 13.70 of the Code.

5 Separation of Transpower roles

The entries below are the open issues in the conflict of interest register. These issues are being handled in accordance with our policy for managing conflicts of interest.

No items were opened in the register during July.

Four entries were closed.

- 21 - Staff interest in generator commissioning
- 22 - Security classifications for PI Vision database access
- 26 - Response to 14 December UFE recommendation
- 32 - Use of the same legal advisor

We have 8 open items in the register.

System Operator Open Conflict of Interest Issues		
ID	Title	Managed by
18	Recommendations from Conflict of Interest Review	Compliance and Risk Manager
27	System operator employee partner to work for grid owner	SO Power Systems Group Manager
29	Preparing the Net Benefit test – SO involvement	Operations Planning Manager
31	Discussions concerning Demand Response	SO Market and Business Manager
33	Sharing working space during lockdown	Grid and Systems Operations Manager
34	Impartial response to COVID-19 pandemic	General Manager Operations
37	Participant request for system operator information via the wrong process	SO Power Systems Group Manager
39	New SO Compliance & Impartiality Manager	General Manager Operations

Greater detail on each of the open conflict of interest issues is provided in the next quarterly report.

6 Project updates

6.1 Market design and system enhancement project updates

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

Real Time Pricing (RTP)
RTP has now completed the capital investigation phase with the Delivery business case submitted to the Authority on July 10 as planned. Solution Requirements and High-level design have also been completed and provided to the Authority. The business change planning is nearing completion and internal and external project update communications were published in July. Work with the Authority on the industry engagement plan will now recommence.

The final forecast cost for the project has increased from the initial business case forecast. This consists of an increase of $1.8m for new scope items introduced by the Authority and an additional $4m of costs in the areas of project risk and contingency, business change management, data warehouse costs and additional senior and lead roles to manage project complexity. These additions have in part been informed by lessons learned in recent high complexity development projects.

Delivery business case approval is expected from the Authority in August.

The Authority has previously approved pre-funding of the delivery phase sufficient to keep the project active to the end of August when the full approval is expected. Delivery phase project activity for July and August includes holding a project team kick-off session for the delivery phase, progressing the detailed design and development of

the first of the solution elements, initiating the system operator Policy Statement review and commencing work on the business change activities.

Dispatch Service Enhancements (DSE)
Testing is underway with Vector and Meridian and they are scheduled to cut over to new ICCP dispatch platform in August/September. Contact has now confirmed they would like to proceed with an ICCP block 2 and web services solution.

Situational Intelligence
Real-time data feeds from fields in the market system and SCADA have been established and the team has concluded the fifth sprint – which enables the rules to query data to be built. Sprint six has now started and will focus on improving performance and completing the functionality developed in first five sprints.

Extended Reserves (AUFLS)
The Authority is engaging with us to complete solution options for a portal to collect Automatic Under Frequency Load Shedding (AUFLS) data from North Island distributors. The TAS statement of work is due to start in August and the delivery business case for capital phase due to complete by Christmas.

Sensitivity Schedules
The project team has developed a proof-of-concept tool to show price sensitivities across trading periods based on demand changes. The team gave a presentation on the tool to the Authority in July and it was launched on Transpower's website in early August.

Market System (MS) Simplification
The project successfully commissioned non-functional changes into the market system in late July to upgrade base code from MS Sequel to Java code. Work is now underway on planning for the next phase of the project, MS Simplification 2, which will continue with the change to the software (re-factor) some of the market system code to improve the design and structure while preserving its functionality.

6.2 Other projects and initiatives

Modifying vSPD for Real Time Pricing stakeholder engagement work
A TAS statement of work is now underway to modify a copy of vSPD. The work will reflect the changes to be implemented under the RTP project, specifically the functionality required for scarcity pricing and outage infeasibilities. This piece of work will enable the proposed changes to be shared, part of the plan to communicate and engage with industry. Modifications are due for completion at the of end September.

Customer Portal project team
The Customer Portal project team has developed an alternative solution to the original proposal that better meets business case objectives and budget. A delivery business case is now being prepared to enable the next phase of the project – to build a new Asset Capability System (ACS).

Inertia monitoring pilot
The trial period concluded on the 24 July. Reactive Technologies will provide us a report during August comparing inertia measurements from their system against our real-time tool calculations. They will also comment on any other challenges of the trials or improvements should future deployment of the system be considered.

Energy Futures: Requirements for inverter connected resources (TAS91)
The Authority requested that our TAS work on changes to Parts 8 and 13 of the Code to adapt to the expected change in power system security resulting from an uptake of inverter-based generating technologies be placed on hold as of 30 June.

7 Technical advisory hours and services.

Technical advisory hours and a summary of technical advisory services to which those hours related (SOSPA 12.3 (d) refers) will be provided in the next quarterly report.

8 Outage planning and coordination

Outage Planning – near real time
Overall outage numbers in July were lower than in June. This was also the case for the number of very short notice outage changes.

July was the first month that Transpower grid owner 'tentative' outages were published to the industry in POCP. These are outages which are unconfirmed or have not been through internal approval processes. This is already proving useful to us in the system operator approval process and to industry as it provides transparency to all interested parties, where we might otherwise have been discussing a potential outage with just one or two connected customers. This change enabled us to signal, for instance, a tentative outage for the recommissioning of the Islington-Livingstone line.

We held a joint system operator and grid owner teleconference on the outage times for the permanent replacement Islington-Livingstone line; this is on track to be put into service on 28 August 2020.

POCP review
The system operator response to the POCP review has been published, along with additional user information for POCP users. This is available on our webpage. Next steps are to progress the suggested tool enhancements and discuss our recommendations with the Authority.

New Zealand Generation Balance
The NZGB July report forecasted no N-1 or N-1-G shortfalls for the next six months under normal conditions. Under the sensitivity and low gas scenarios, several N-1-G shortfalls were forecasted from July through to November. These are primarily due to increasing loads over winter, transmission outages and several generator outages. The shortfalls have reduced since the forecast in June, with the additional Huntly Rankine unit available until the end of August.

The NZGB assessments now include grid owner tentative transmission outages, as these are now reported in POCP.

The format of the monthly NZGB report is currently under review. Our intention is to publish a simpler, easier to understand report in August.

9 Power systems investigations and reporting

System Security Forecast (SSF)

Analysis work for the major two-yearly SSF commenced this month. With the proposed Tiwai exit, this December's publication of the SSF will be important to industry, as it will outline the constraints the system operator will be operating to post-Tiwai exit.

10 Performance metrics

System operator performance against the performance metrics for the financial year as required by SOSPA 12.3 (a) will be provided in the next quarterly report.

11 Cost-of-services reporting

This will be provided to the Authority at the same time as the publicly disclosed financial information under the Transpower Information Disclosure Determination [2014] NZCC 5, in late October.

12 Actions taken

A full list of actions taken regarding the system operator business plan, statutory objective work plan, participant survey responses and any remedial plan, as required by SOSPA 12.3 (b) will be provided in the next quarterly report.

System performance

13 Security of supply

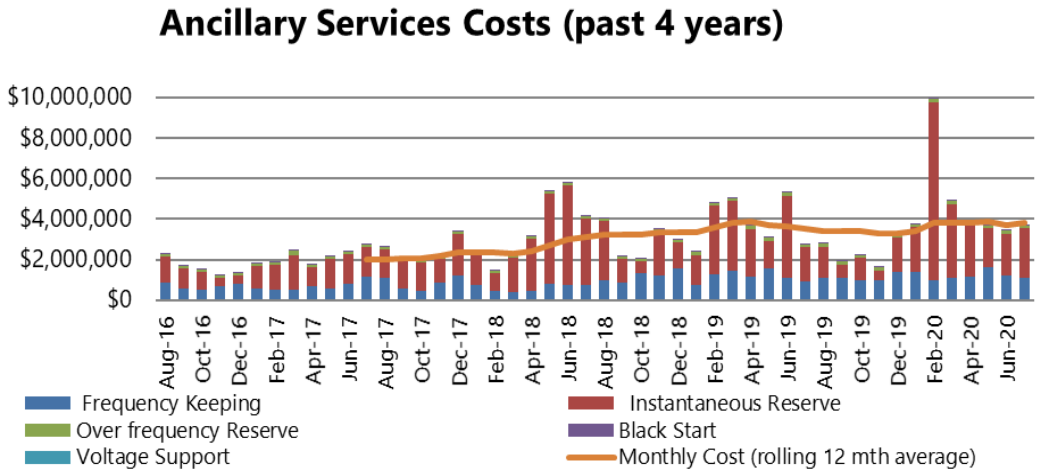
Hydro levels are below average which has created high prices throughout the month. Because the risk, as shown in the Electricity Risk Curves, is now past the peak and declining through to summer, low storage levels are not a risk to security of supply in the short-term. This situation is also supported by Genesis announcing an additional 160 MW of generation via a third Rankine unit should market conditions require it. All thermal plant is running and appears free from gas availability constraints, underpinned by soft methanol prices. Towards the end of June, Methanex was operating at 60 per cent of capacity.

Pohokura output is in faster decline than expected. It is currently down 50 to 40 TJs since April. The cause is not yet determined but a compressor is due to be installed in late August which should help arrest the decline.

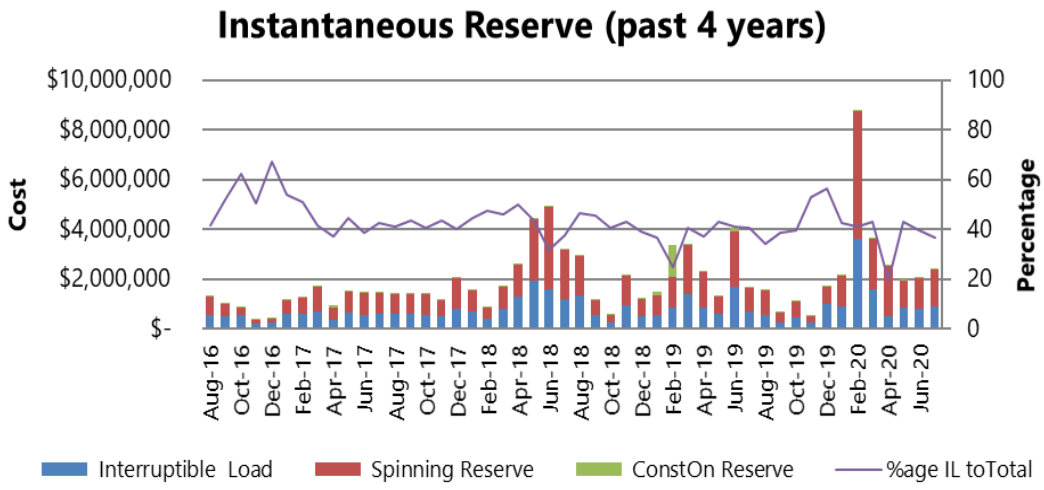
From a security of supply perspective, the pending closure of Tiwai releases more energy improving our security margins. However, there is an increased risk to the North Island capacity margins should North Island thermal units close before transmission upgrades which enable South Island surplus to reach the north across the winter peaks. The financial viability of the North Island thermal stations could also be affected by changes to existing contractual agreements between the generators.

Given the technology of the larger thermal generating plant is favoured towards operating as baseload due to high start-up costs, the short periods of high spot prices over demand peaks are unlikely to create an incentive for them to remain in the market.

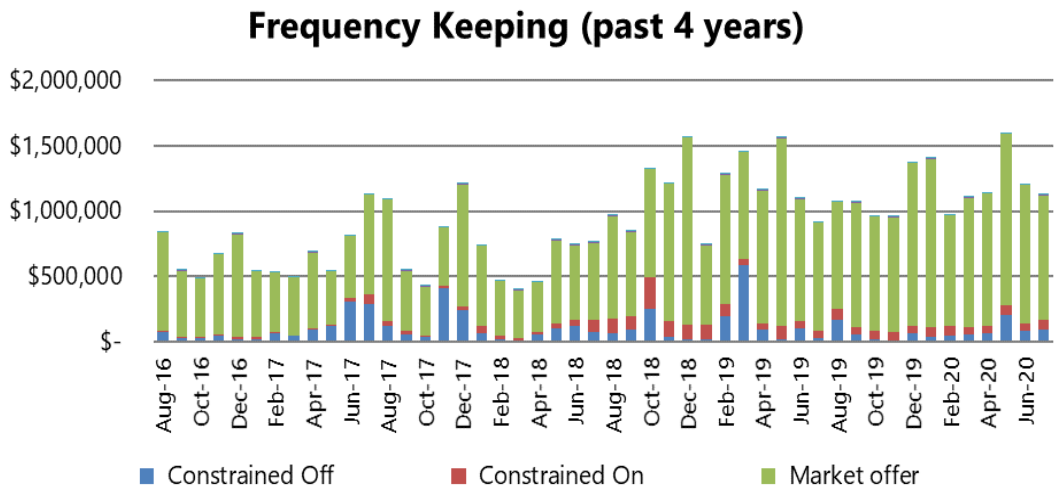
14 Ancillary services



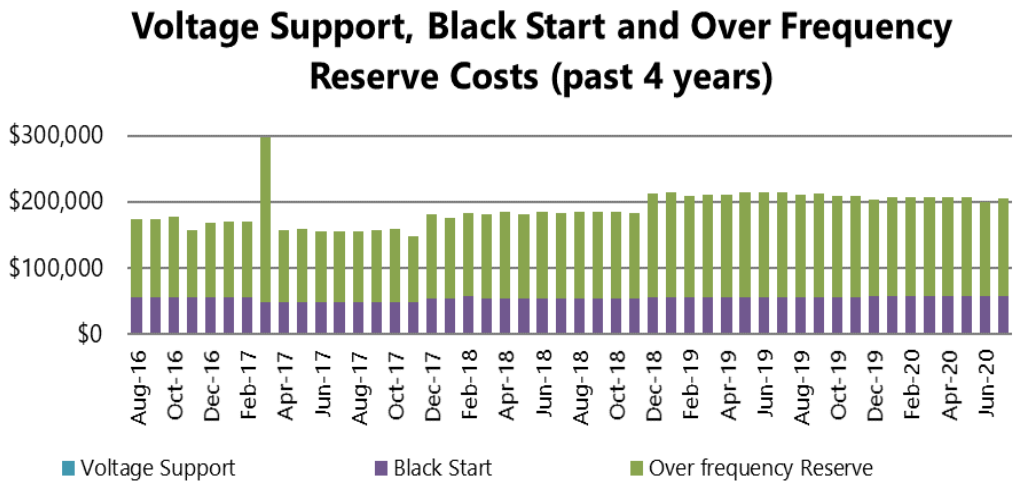
This month's ancillary services costs were $3.7 million, similar to the costs in the last few months. There was an increase of $267k (7.7 per cent increase) from last month. The increase is a result of an increase in instantaneous reserve costs (see below).



This month's instantaneous reserve costs were $2.4 million, an increase of $342k (16 per cent increase) from the previous month. Over a third of the costs arose from four days of cold weather and subsequent high demand on 1-2 and 27-28 July. Of the instantaneous reserve total, the spinning reserves costs for the month were $1.5 million, an increase of $279k (23 per cent increase); the interruptible load costs during the month increased by $66k (8 per cent increase).



This month's frequency keeping costs were $1.1 million, a small decrease of $80k to the previous month (7 per cent decrease). There were small increases in both constrained on and constrained off costs this month.



The over frequency costs increased slightly and black start costs did not vary this month; these were $147k and $58k respectively. There are currently no voltage support costs.

15 Commissioning and Testing

Generation testing and commissioning

Ngawha (32 MW geothermal) is currently due to connect in October 2020, Turitea (119 MW wind) and Waipipi (133 MW wind) are due to connect later this year and finish commissioning in the first quarter of 2021. The security and market impacts of having the two wind farms commissioning concurrently are being worked through.

16 Operational and system events

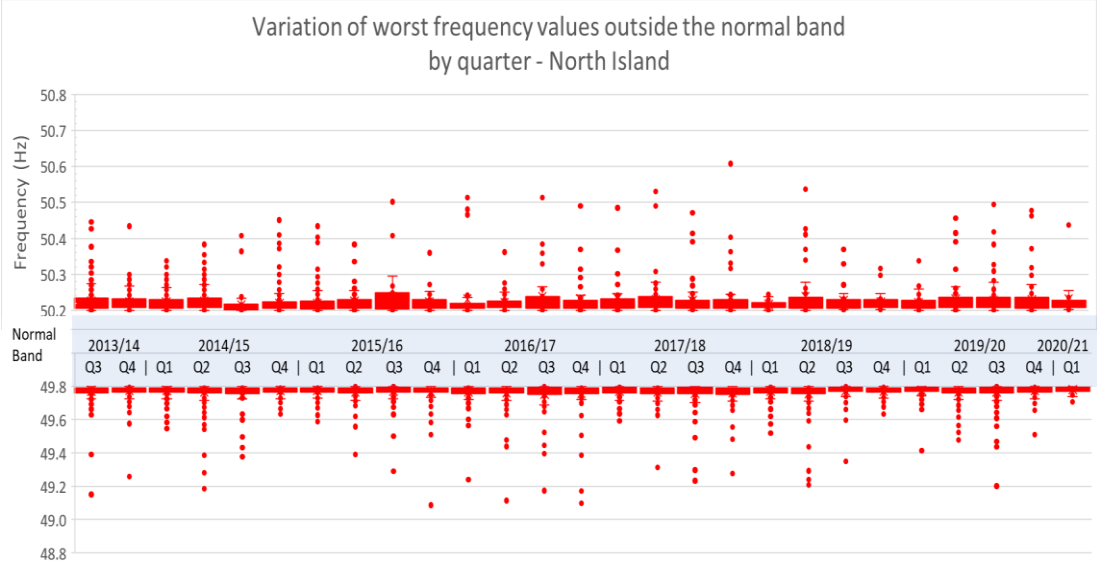
There was nothing material to report in July.

17 Frequency fluctuations

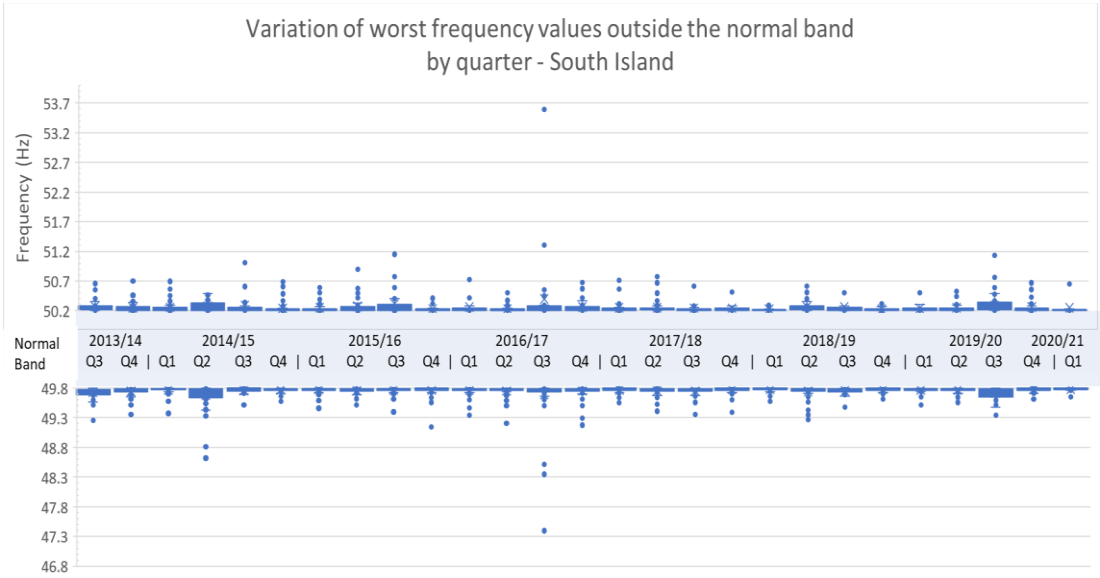
17.1 Maintain frequency in normal band (Frequency value)

The following charts show the distribution of the worst frequency excursion outside the normal band (49.8 to 50.2 Hz) during the reporting period.

North Island



South Island



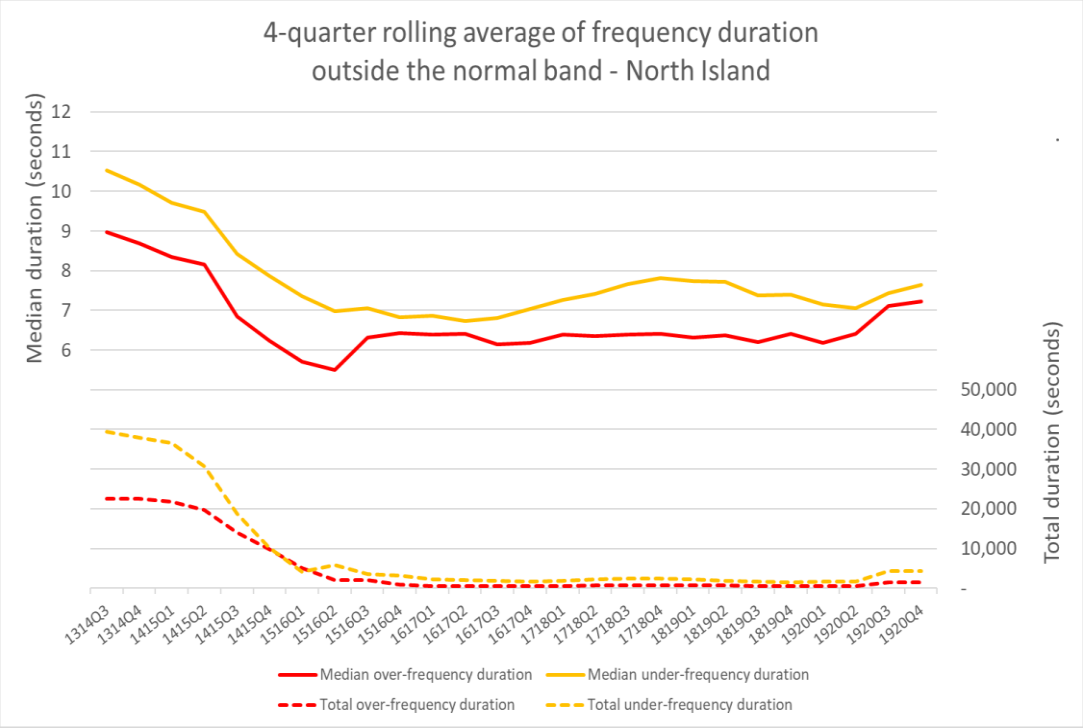
* 2020/21 Q1 contains data for July only

Note: These box and whisker charts show the distribution of data. The “box” represents the distribution of the middle 50% of the data, the “whiskers” indicate variability, and outliers are shown as single data points.

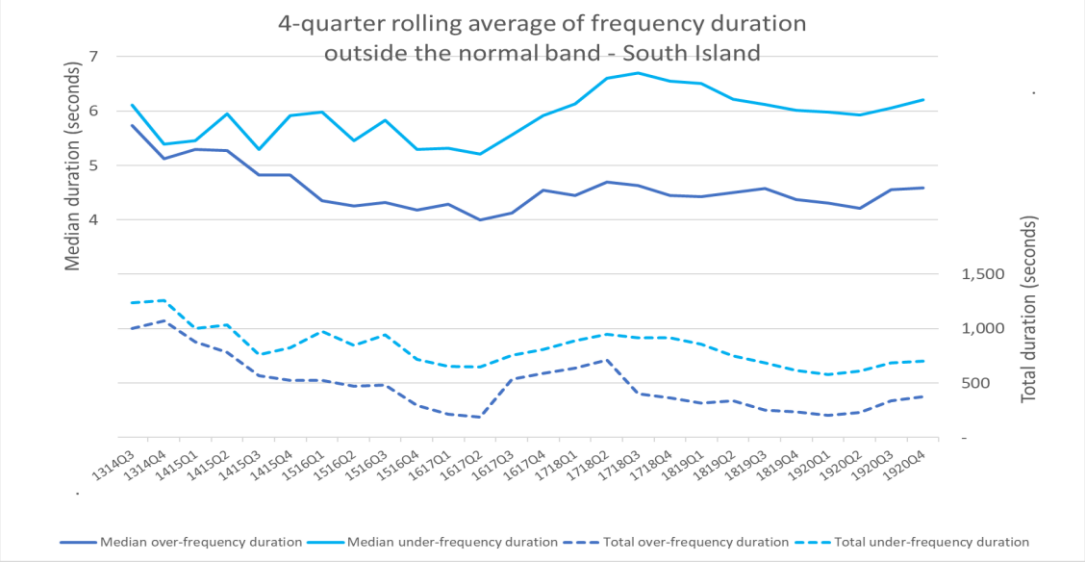
17.2 Recover quickly from a fluctuation (Time)

The following charts* show the median and total duration of all the momentary fluctuations above and below the normal band for each island. The information is shown as a 4-quarter rolling average to illustrate trends in the data

North Island



South Island

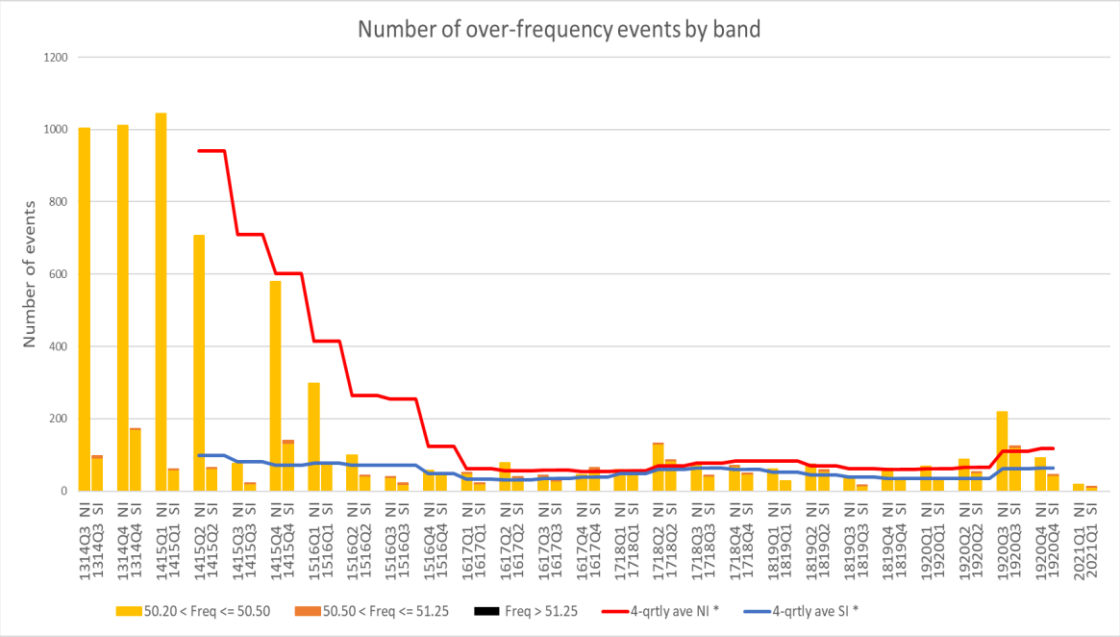


* These graphs have not been updated since 2019/20 Q4; they will only be updated at the end of each quarter

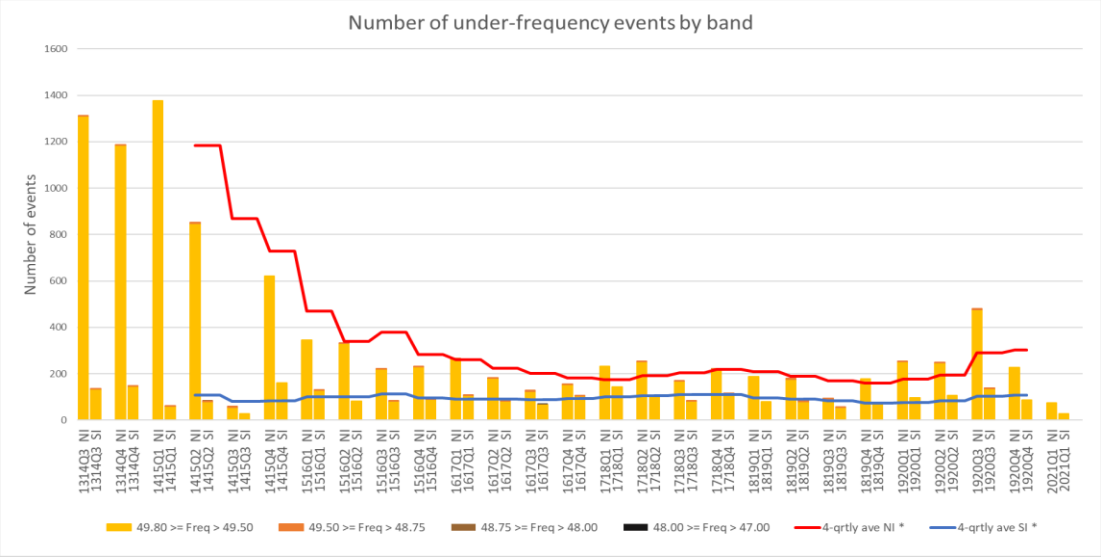
17.3 Manage frequency and limit rate of occurrences during momentary fluctuations (Number)

The following charts show the number of momentary fluctuations outside the frequency normal band, grouped by frequency band, for each quarter since 2014. The information is shown by island, including a 4-quarter rolling average to show the prevailing trend.

Over-frequency events



Under-frequency events



Note: The 2020/21 Q1 contains data for July only.

* 4-qtrly averages for NI and SI will only be updated at the end of each quarter

17.4 Manage time error and eliminate time error once per day

There were no time error violations in the reporting period.

18 Voltage management

Grid voltages did not exceed the Code voltage ranges during the reporting period.

19 Security notices

The following table shows the number of Warning Notices, Grid Emergency Notices and Customer Advice Notices issued over the last 12 months.

Notices issued	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Demand Allocation Notice	-	-	-	-	-	-	-	-	-	-	-	-
Grid Emergency Notice	1	-	1	3	-	-	-	1	-	-	1	-
Warning Notice	-	-	-	-	-	1	-	2	-	-	-	-
Customer Advice Notice	14	6	15	15	14	6	21	14	13	10	13	11

20 Grid emergencies

The following table shows grid emergencies declared by the system operator.

Date	Time	Summary Details	Island
		None	

Appendix A: Discretion

Event Date and Time	Description
1/07/2020 21:05	MKE1101 MKE1 discretion: Test after TGTL tag changed, not dispatched: Last Dispatched MW: 92.5
1/07/2020 22:15	JRD1101 JRD0 discretion: Test solve for TGTL trader change. RTD not dispatched. Last Dispatched MW: 49.2
21/07/2020 19:50	ROT1101 WHE0 discretion: Suspect protection fault on CB312. Last Dispatched MW: 16