TRANSPOWER

MONTHLY SYSTEM OPERATOR AND SYSTEM PERFORMANCE REPORT

FOR THE ELECTRICITY AUTHORITY

Transpower New Zealand Limited
July 2019

Keeping the energy flowing




TRANSPOWER

Transpower New Zealand Limited The National Grid

Report Purpose

This report is Transpower's review of its performance as system operator for July 2019, 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 joint industry briefing with Transpower's grid owner on the 2020 HVDC outages and continue to work with grid owner representatives and industry. We have engaged a consultant to provide an independent review of our testing plan.
- We have started work with First Gas on business continuity planning.
- The Real Time Pricing project capital phase is well underway.
- The Dispatch Service Enhancements project was deployed into production on 8 August 2019. We are accelerating communications with participants regarding their plans to migrate from GENCO.
- We have created the Operations "Big 4" programme of work to meet the needs of future industry changes, as well as supporting our commitment to review external deliverables with customers.
- The new version of the Security of Supply Forecasting and Information Policy (SoSFIP) came into effect on 1 August 2019.
- The trial classification of busbar frequency risk, based on the agreed methodology, has been completed.

2 Customer

HVDC 2020 outages

We held a joint industry briefing with Transpower's grid owner on the HVDC 2020 outages. Grid owner representatives set out the outage programme work during the 13-week period. System operator representatives provided advice on generation margins during the outages, the treatment of frequency keeping during the outages and the system operator review of the testing plan. We have engaged an independent consultant from Canada to review testing requirements and reinforce impartiality. The briefing was well attended by traders, generators, retailers, large users and the Electricity Authority. We are continuing to work with grid owner representatives and industry.

3 Risk & Assurance

We received the final report for the audit of our Real Time Risk Adjustments process and are now agreeing and finalising actions. This was one of our business assurance audits for the 2018/19 year. A draft of the management review of the Reserve Management Tool (RMT) change management process has also been received.

We started work with First Gas on business continuity planning to ensure that we are aware of the interactions and impacts for each organisation during a major event.

4 Compliance

We reported one new system operator breach to the Authority in July. This related to the recent upgrades to the SCADA hardware which impeded an automated update process. The issue degraded information used in the load forecast which is an input

into the published forward-looking schedules. There was no market or operational impact from the error.

We have a total of six breaches with the Authority Compliance team. Two of these breaches are still going through the Authority Compliance investigation process. None of these breaches are significant in market or system impact.

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.

There were no new COI issues recorded this month.

System Operator Open Conflict of Interest Issues		
ID	Title	Managed by
9	HVDC Outages 2019/20	Operations Planning Manager
18	Recommendations from Conflict of Interest Review	Compliance and Risk Manager
21	Staff interest in generator commissioning	GM Operations
22	Security classifications for PI Vision database access	SO Power Systems Group Manager
26	Response to 14 December UFE recommendation	SO Power Systems Group Manager

6 Project updates

6.1 Market design and system enhancement project updates

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

Real Time Pricing
The capital phase is well underway. We are working with the Authority to finalise plans, including project assurance. Internally, focus is on the business analysis required to inform the IST project deliverables from October 2019.

Dispatch Service Enhancements
We completed the papers required for the 8 August Electricity Authority Board to approve additional budget for the project. John Clarke attended the Board meeting to answer any questions the Board raised.

Following a revision of the delivery timeline, the project delivered the original business case scope by 8 August. The project budget is being closely monitored, and although we overspent the original budget, our forecasts remain within the re-baselined estimates to complete the original scope of the project.

The project was deployed into production on 8 August 2019. This has been a challenging project and we will be conducting a review.

We are also near to completing the planning required to mobilise the team that will manage the transition of participants to new dispatch products. Communications continue with participants regarding their plans to migrate from GENCO. We will be working with participants to refresh the implementation plan during August/September.

Wind Offers
The project is on schedule to commission on 19 September 2019. This project is forecasting to deliver under budget.

Situational Intelligence
The scope of the investigation was extended to enable additional technical concepts to be proven. Work to complete additional scope is underway and on track for completion in early September.

Extended Reserves
We sent a letter to the Authority confirming the system is secure for identified extended contingent event (ECE) risks with the existing 2-block AUFLS scheme. This letter also confirmed that Transpower in its role as system operator sees benefit to New Zealand in moving to a simple 4-block AUFLS scheme, as less load may be shed responding to an ECE.

We received a technical advisory service statement of work from the Authority, which engages the system operator to support the Authority develop a paper on how to reset the project (scheduled for October 2019).

6.2 Other projects

Credible Event Review
The trial classification of busbar frequency risk, based on the agreed methodology, has been completed and a report drafted. The recommendation from the trial is to classify Huntly and all other North Island busbars as ‘other’ risks. The recommendation for Manapouri is to classify it as an ECE risk. These classifications result in no change to how these risks are managed.

Energy Futures
A teleconference was held with Reactive Technologies to understand the service they offer in monitoring system inertia. At this stage we are engaging with them to understand the likely costs and benefits of such a system. The aim is to determine if and when New Zealand would want to invest in a system of this nature. Reactive Technologies has just signed a six-year service deal with National Grid UK, however their inertia context is significantly different to that of New Zealand’s.

Operations "Big 4"

This programme of work focuses on enhancing our operational services to meet the needs of future industry changes, as well as supporting our commitment to review external deliverables with customers. Over the next month governance will be established, and management of this work will start across the programme.

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 Investigations

Argentina, Uruguay and Paraguay blackout

We have been following the investigation and findings from the 16 June 2019 Argentina, Uruguay and Paraguay blackout, with an aim of identifying any lessons for New Zealand. We joined a webex this month hosted by the Electric Power Research Institute (EPRI) on what they have determined so far, and a broader discussion on equipment and system failures leading to blackouts. As with the Australian National Electricity Market separation, we will be preparing an overview report to share with industry.

9 Outage planning and coordination

Outage Planning

There were short notice HVDC outages this month to remedy the HVDC oscillation fault. The long-term solution is now in place.

Low Lake Waikaremoana storage led to us having discussions with Genesis so we can learn how the river is being managed and can best assist with fuel conservation, particularly when it impacts outages and pricing in the region.

HVDC 2020 outages

Transpower's grid owner has rescheduled the HVDC 2020 bipole outages during the January-April period to weekend dates. We analysed generation scenarios during this time (including reduced gas and no wind). Adequate margins are seen in NZGB for all these scenarios, which confirms a lower risk of generation shortfalls during the bipole outages, compared to the original weekday dates. Our latest analysis of generation margins again includes a low gas, low wind scenario which was showing low margins during concurrent Huntly 1, Pohokura and HVDC outages. However, Genesis has since rescheduled its Huntly 1 outage.

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

Cost-of-services reporting (SOSPA 12.3 (c)) will be provided in the next quarterly report.

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

National storage has decreased during July despite two large inflow events. North Island storage, which was at very low levels in May, has recovered and is now at 97% of average. Conversely, South Island storage has dropped during the month but remains at healthy levels – 118% of average for this time of year. This has underpinned the high levels of hydro generation seen throughout July.

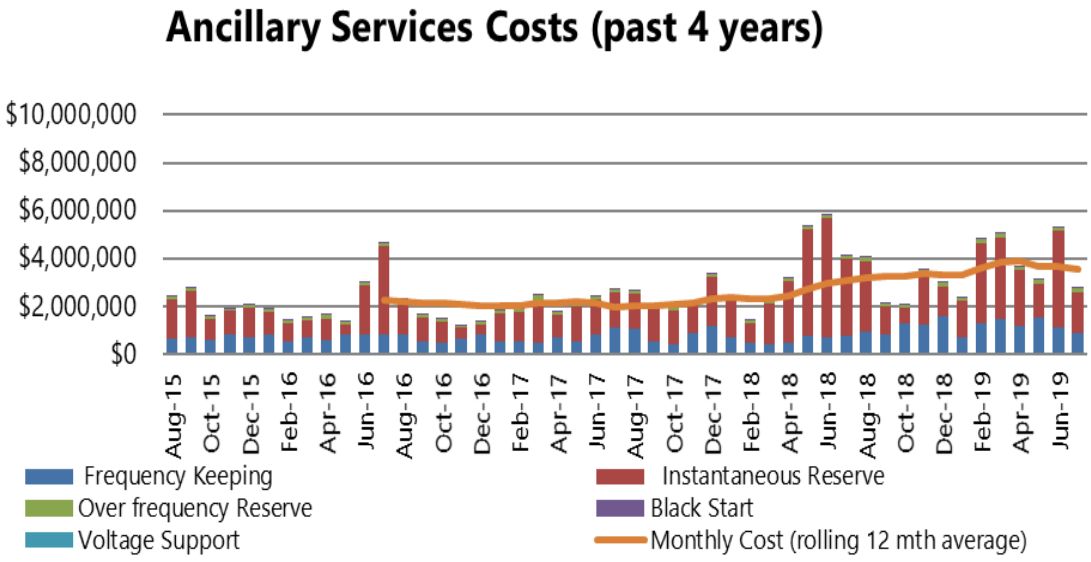
Security of Supply Forecasting and Information Policy

The new version of the SoSFIP came into effect on 1 August 2019. The policy relates to the operational management of Security of Supply and the key change is the inclusion of contingent storage for risk analysis. We hosted an industry workshop on 4 July to discuss and explain the changes to the SoSFIP which was well received by industry participants.

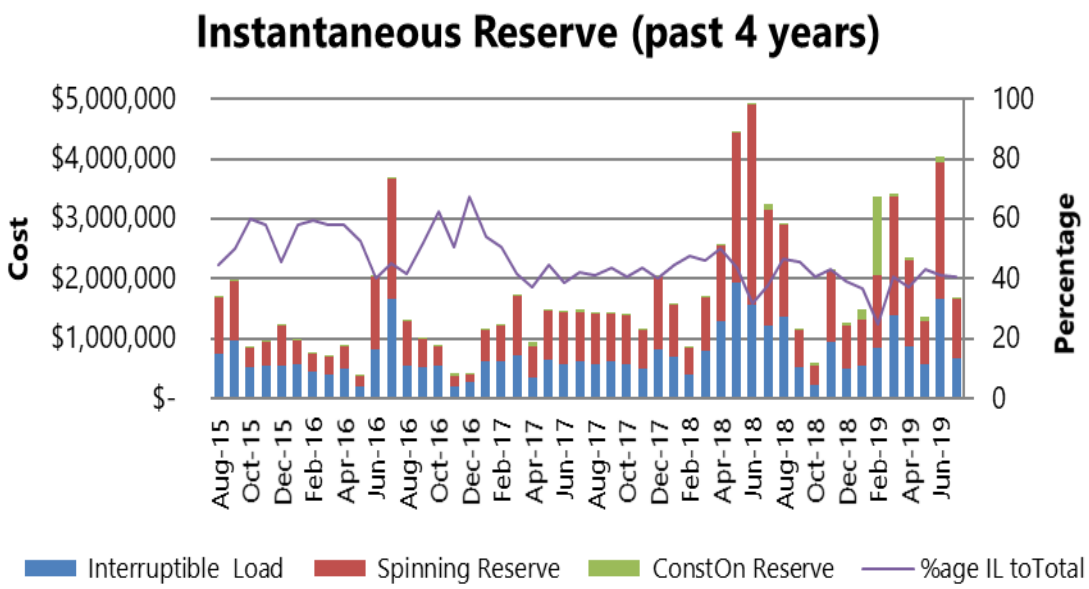
Security of Supply strategy

We have delivered the final version of our Security of Supply strategy to the Electricity Authority; this is part of our Joint Work Plan objectives.

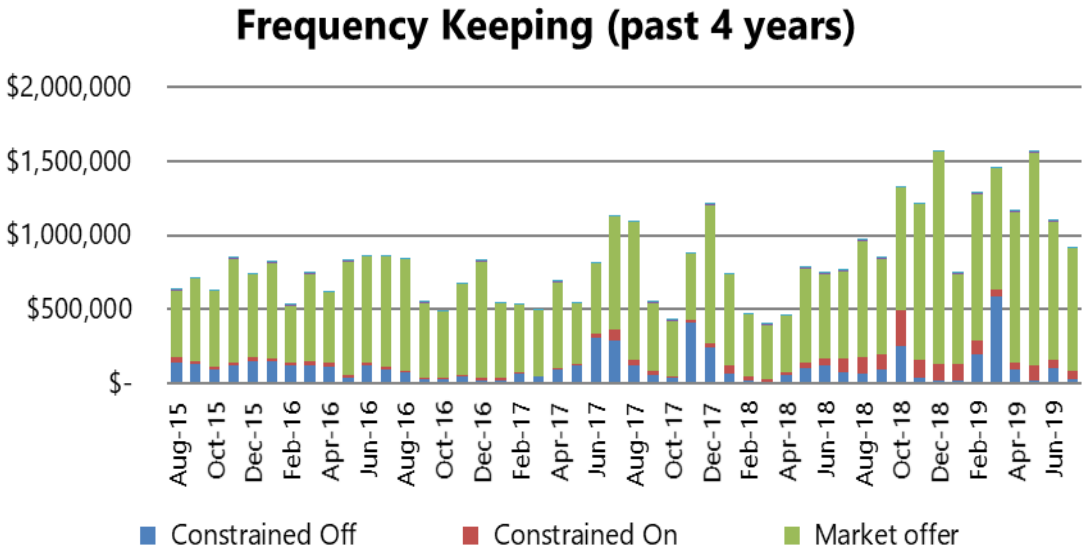
14 Ancillary services



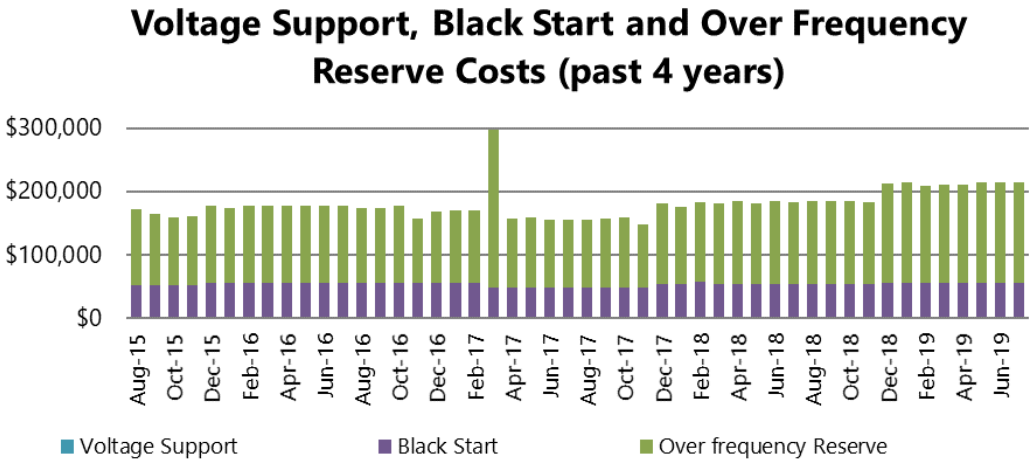
The overall ancillary service costs reduced in July to almost half of what they were in June. They were $2.81 million this month, compared to $5.36 million in June, a decrease of $2.55 million.



The bulk of this decrease came from a reduction in Instantaneous Reserve costs which decreased by $2.36 million (58%) to $1.68 million. This is more of a reflection of the higher reserve costs for June. In June the seven highest daily loads were higher than any of the daily loads for July. In June, half of the reserve costs were attributable to those seven days.



This month's frequency keeping costs decreased by $182k (17%) to $920k. The largest proportional change was the constrained off costs which reduced by $78k (76%) to $27k, though the greatest absolute change was the market offer which reduced by $108k (12%) to $829k. This decrease is a further reflection of the high load periods in June compared to July.



The Black Start costs and Over Frequency Reserve costs remain fixed at the contracted value of $56k and $159k respectively. There are currently no Voltage Support costs.

15 Commissioning and Testing

We are working on a register which shows all our active commissioning and testing work.

Windfarm connection activity increase

We are actively dealing with connection applications for multiple windfarms.

Solar farm connection

We are engaging with the designer for the Maranga Ra Solar Farm to work through compliance with the Code asset owner performance obligations (AOPOs).

Other commissioning

We are continuing to work on commissioning activities for the gas turbines at Junction Road, and the expansion of the geothermal station at Ngawha.

16 Operational and system events

HVDC Oscillations

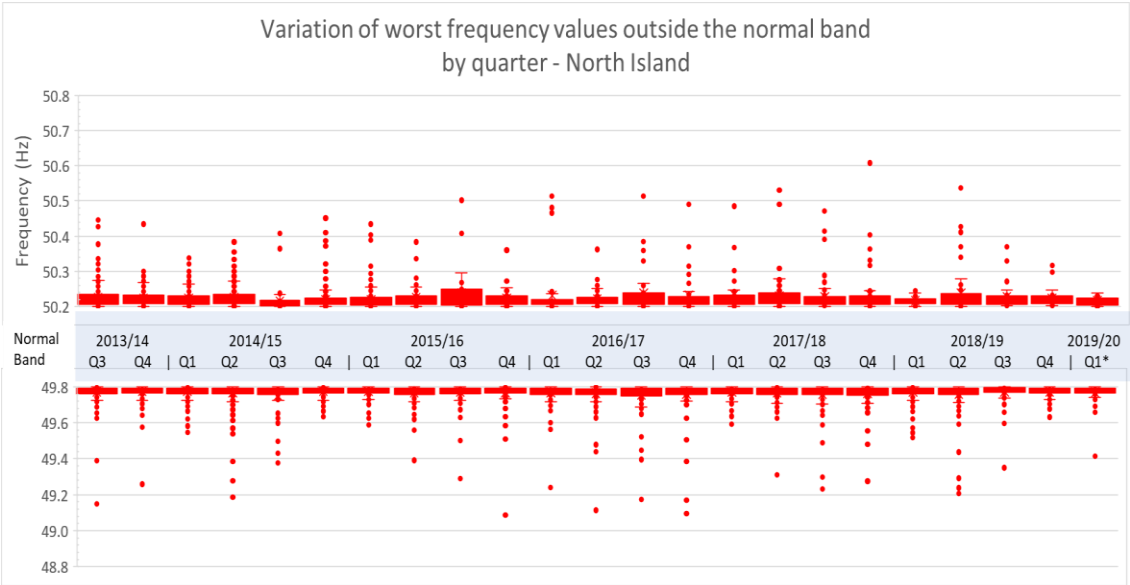
There was a 3-hour outage on 1 July to replace secondary systems associated with Pole 2 voltage measuring equipment. This was a response to an issue identified in May causing oscillations on the grid. Further oscillations were detected following this initial outage and a second outage of 12-hours occurred on 27 July to replace the entire voltage measurement device which has appeared to resolve the issue. As system operator, we will monitor this situation for three months. If nothing further is observed, we will close this issue and write a summary report.

17 Frequency fluctuations

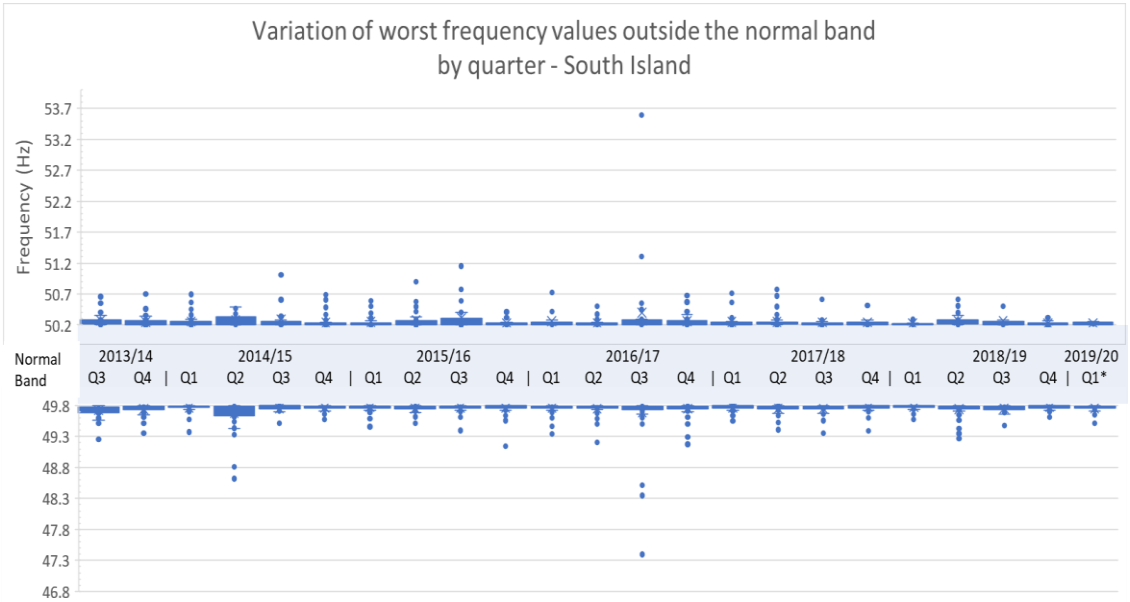
17.1 Maintain frequency in normal band (Frequency value)

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



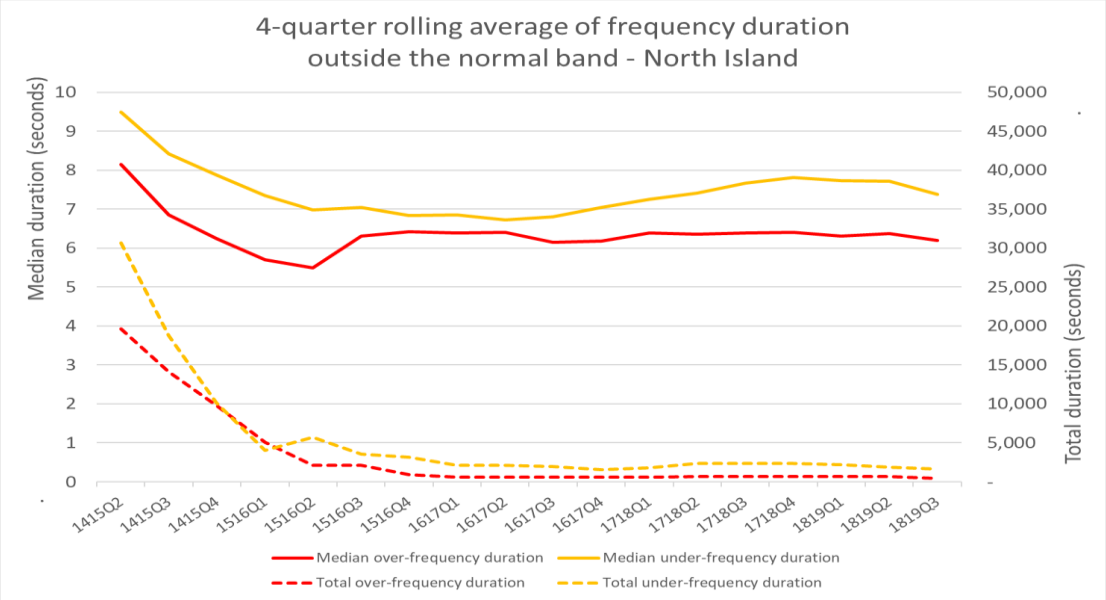
* 2019/20 Q1 contains data for July only

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.

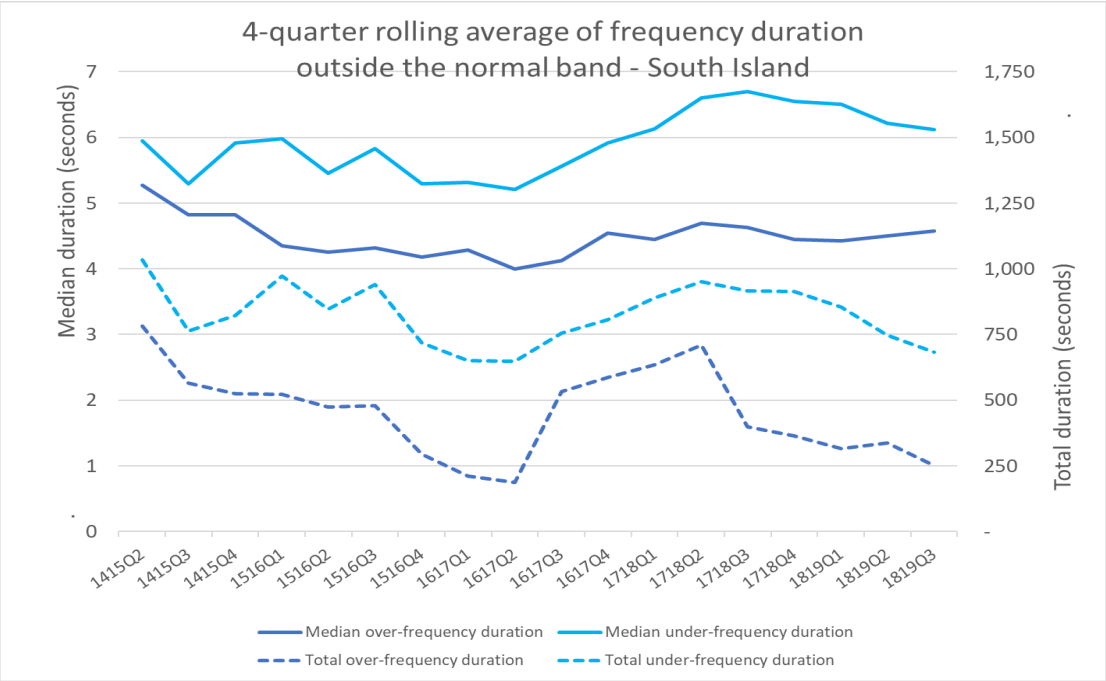
17.2 Recover quickly from a fluctuation (Time)

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

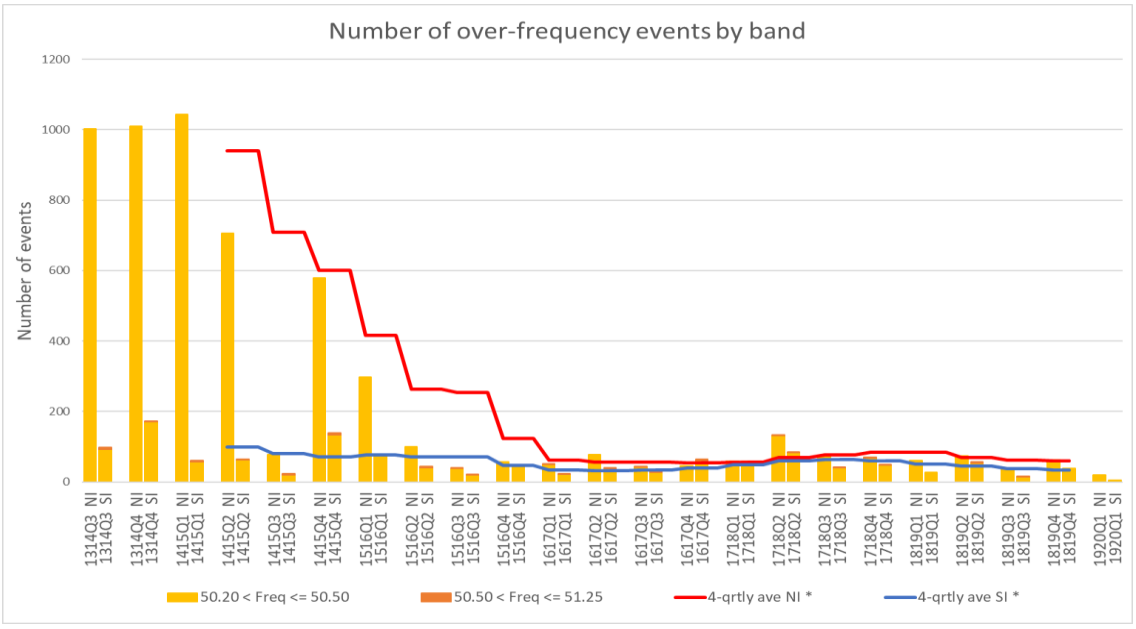


* These graphs have not been updated since 2018/19 Q4; they will only be updated at the end of each quarter

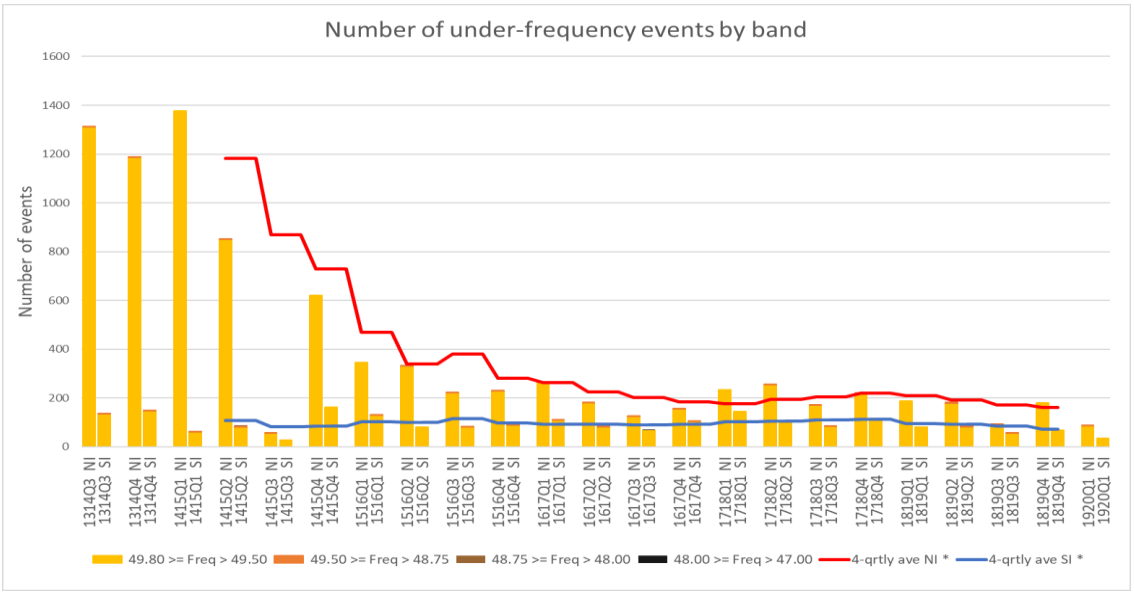
17.3 Manage frequency and limit rate of occurrences during momentary fluctuations (Number)

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 2019/20 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-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19
Demand Allocation Notice	-	-	-	-	-	-	-	-	-	-	-	-
Grid Emergency Notice	1	-	-	-	-	-	-	1	-	-	-	-
Warning Notice	-	-	-	1	-	-	-	-	-	-	1	-
Customer Advice Notice	9	9	6	20	20	16	6	7	4	8	17	9

20 Grid emergencies

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

Date	Time	Summary Details	Island
		None this month.	

Appendix A: Discretion

Event Date and Time	Description
18-Jul-2019 02:30:53	NAP2201 NAP0: Due to a tripping of NAP. Last Dispatched MW: 134
18-Jul-2019 10:38:06	MAN2201 MAN0: Return of an extended potline 1. Last Dispatched MW: 666
22-Jul-2019 14:30:38	MAN2201 MAN0: Extended potline process. Last Dispatched MW: 738
30-Jul-2019 08:13:12	ARG1101 BRR0: Due to a tripping of BLN_KIK_1. Last Dispatched MW: 11.5
30-Jul-2019 08:29:04	ARG1101 BRR0: Due to a tripping of BLN_KIK_1; an offer change was received. Last Dispatched MW: 0
30-Jul-2019 10:52:36	MAN2201 MAN0: Extended potline Line 2 restoration. Last Dispatched MW: 666
31-Jul-2019 07:26:00	COL0661 COL0: Limited generation due to West Coast tripping. Last Dispatched MW: 12