TRANSPOWER

MONTHLY SYSTEM OPERATOR AND SYSTEM PERFORMANCE REPORT

FOR THE ELECTRICITY AUTHORITY

Transpower New Zealand Limited

August 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 August 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).

Table of Contents

This page is intentionally blank.

System operator performance

1 Highlights this month

- We published our system operator self-review for 2018/19 that sets out the actions we've taken to meet our strategic goals.
- The initial business case for Real Time Pricing was approved by the Authority Board.
- New dispatch interfaces were successfully commissioned into the market system. The first participant is likely to transition to the new interfaces in September.
- We are continuing engagement with the gas industry and generators regarding the planning of the HVDC 2020 outages. This engagement enables us to maintain coordination and confirm scenarios for on-going analysis of the New Zealand Generation Balance.
- We issued our first two customer advice notices on low residual situations; these notifications are to improve market information from our experiences during the November 2018 HVDC outages.
- We worked with Meridian to successfully complete the Aviemore black start test.

2 Customer

Annual self-review

We provided our annual self-review of the system operator service for 2018/19 to the Electricity Authority on 30 August. The review sets out how we performed, including the actions we took to meet our strategic goals, our response to the Authority's recommendations from last year's review and our progress against our business plan initiatives.

System Security Forecast (SSF) minor update

The 6-monthly review of the SSF was completed with revised documents being published on the website. These revisions include the impact of committed projects such as the Ngawha Geothermal expansion, New Plymouth substation exit, the Junction Road generator, Ohinewai capacitors, Turitea Wind Farm, Te Awamutu capacitors, Otahuhu T4 replacement, Otahuhu T2 decommissioning and Penrose T10 decommissioning, and the Kikiwa Reactor.

Report on an independent system operator service

We provided a report, written by the Sapere Research Group, to the Electricity Authority and the System Operations Committee on the likely added costs to New Zealand if the system operator service was delivered independently of Transpower. This report was built on a previous 2015 report. On average, a separate system operator would increase industry costs by over $26 million each year than the status quo, driven by costs associated by duplicated IT systems, facilities and corporate services and higher operating costs.

3 Risk & Assurance

We have started the first of our planned audits for this year – an audit of the Test Plan process. This will involve interviews with both internal staff and external participants.

The audit of Reserve Management Tool change processes was completed as an identified action for the breach in January 2019. There are four recommendations which have been assigned and are underway. Three are due for completion in December and one by July 2020.

Actions from the 2017 South Island AUFLS event

The action requiring an audit of our risk and assurance activities to High Impact Low Impact (HILP) events has made good progress towards being closed. Of the subsequent actions identified by the Advisian report, the four remaining actions are all underway. We are on track to deliver before the planned audit in Q4 this financial year.

4 Compliance

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

We have four outstanding breaches with the Authority Compliance Team. For one of these, the Reserve Management Tool corrupt file input breach, a settlement meeting was held this month with Meridian and the grid owner. All parties agreed there was no need for a formal settlement as all parties agreed that the actions being taken by the system operator in response to the breach satisfied their concerns.

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 (COI) register. These issues are being handled in accordance with our policy for managing conflicts of interest.

There were no new COI issues recorded in August.

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

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
The initial business case was approved by the Authority Board on 8 August. Work continues on defining requirements for the dispatch notified (DNX) products for inclusion in delivery business case next year. An independent quality assurance (IQANZ) health check was commissioned in August with results expected by October 2019.

Dispatch Service Enhancements
On 8 August, the Authority Board approved requests for additional budget and time to deliver the original scope of the business case, as well as additional scope to deliver control tag functionality and capitalisation of costs to transition individual participants onto new platforms. Also, on 8 August, new dispatch interfaces were successfully commissioned into the market system. The transition team is now engaging with participants to plan transition from Genco to the new dispatch platform of their choice. The first participant is likely to transition to the new interfaces in September.

Wind Offers
New wind offer arrangements will take effect from 19 September enabling wind generation to be offered in the same way as other generation is offered into the market (through multiple tranches and unrestricted offer prices). This follows Code changes which were gazetted at the end of July and IST changes which were deployed into the market system on 5 September.

Situational Intelligence
The final sprints of the investigation phase are underway, and the project is tracking to meet its investigation phase targets. The focus in September will shift to the preparation of the delivery business case.

6.2 Other projects

Operations "Big 4"
One of the work streams is to update Industry Reports and Interfaces. The Electricity Authority supports our intention to carry out a review of POCP (Planned Outage Coordination Process). The last review was carried out in 2013 and feedback from industry supports another review. We are inviting industry representatives to an initial working group session. We are also continuing to validate and update our New Zealand Generation Balance tool.

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

There were two significant, successful, Manapouri bus outages over the last 6 weeks both of which required agreements with Meridian to remove a unit prior to the outage due to potential lack of AUFLS overnight. There were also outages of the Kawerau bus which required significant planning effort and generation constraints. For the Kawerau outages we published a customer advice notice to provide information ahead of the outages, in line with our Outage Planning Policy.

HVDC 2020 outages

A Pohokura gas outage has been scheduled for 11–24 March 2020; this is during the January–April window for the planned HVDC 2020 outages. Regular discussions with generators and the gas industry have helped us to test generation assumptions during the HVDC outages. We continue to analyse several generation scenarios during this time (including reduced gas and no wind) and provide this additional analysis in our NZGB monthly reports.

9 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.

10 Cost-of-services reporting

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

11 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

12 Security of supply

National storage steadily decreased during August, which is normal for this time of year. At the end of August, North Island storage, which was at very low levels in May, was at 112% of average for this time of year. South Island storage was average for this time of year.

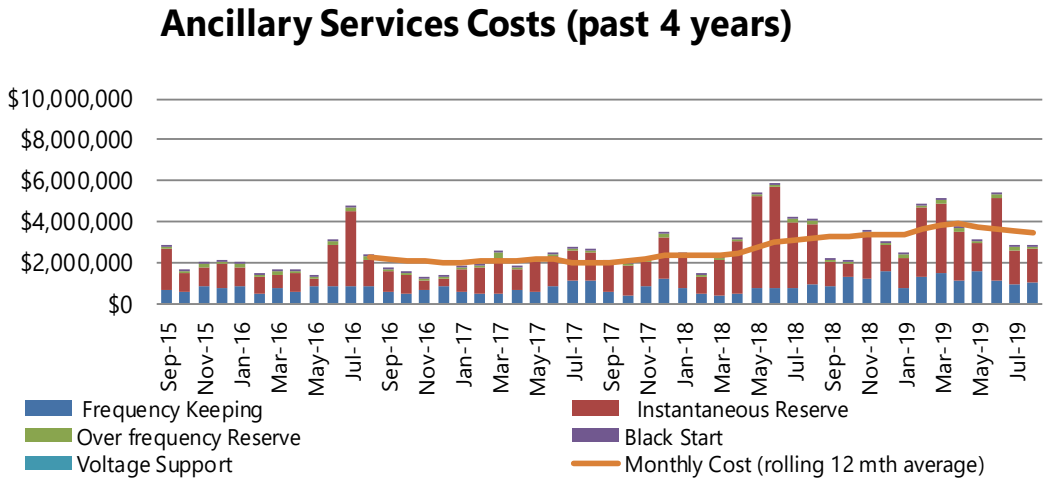
Thermal fuel supply disruptions

In September, we will be publishing updated 'thermal fuel supply disruptions' scenarios, as Electricity Risk Curves (ERCs) and Simulated Storage Trajectory (SST) scenarios. These assess the impact of thermal fuel limitations on security of supply. The scenarios, that include both short-term high impact restrictions (such as a gas pipeline outage) and a longer more sustained restriction, show the system can manage thermal fuel limitations. The risk increases in these scenarios, but there are no near-term (2019/20 year) concerns for security of supply.

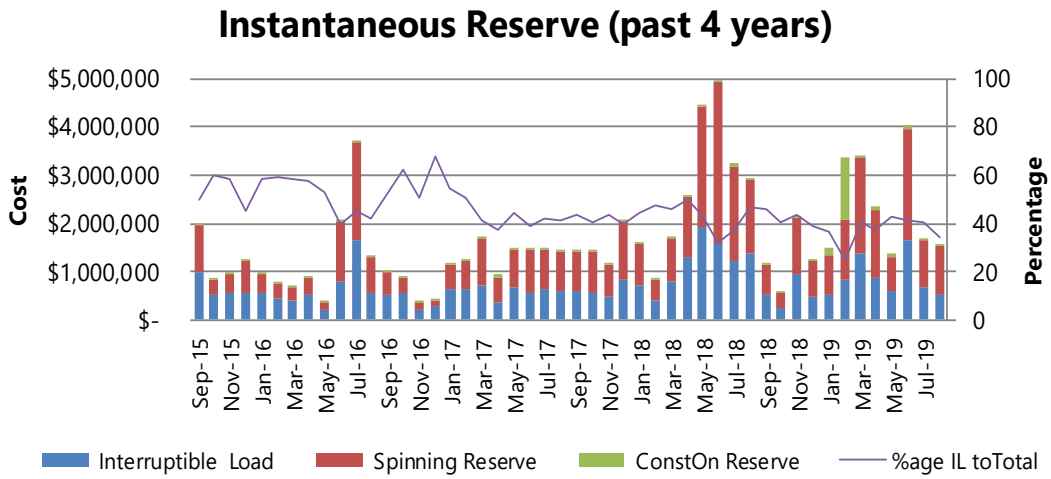
Security of Supply strategy

We are making good progress on the actions in our security of supply strategy – this includes improvements to the security of supply webpages and our weekly reporting and a review of our rolling outage procedures in an emergency supply situation.

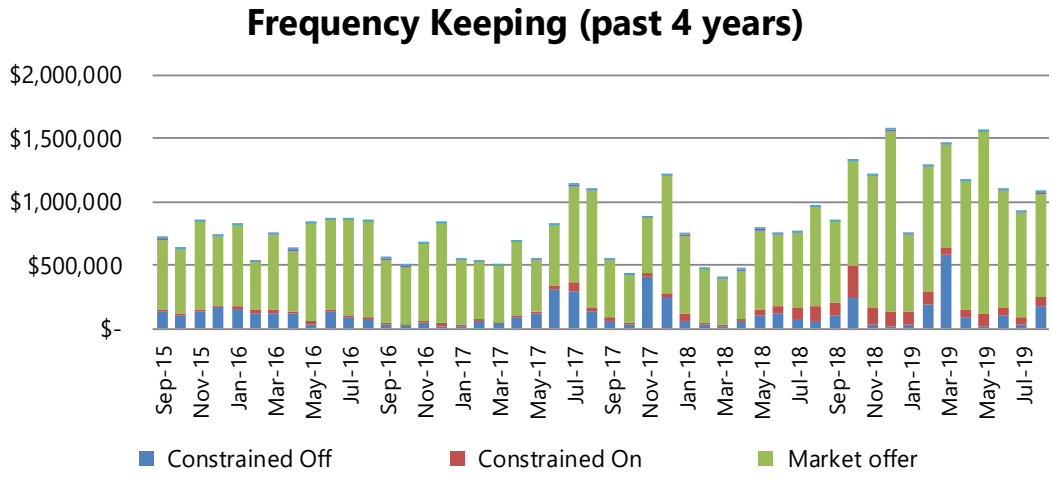
13 Ancillary services



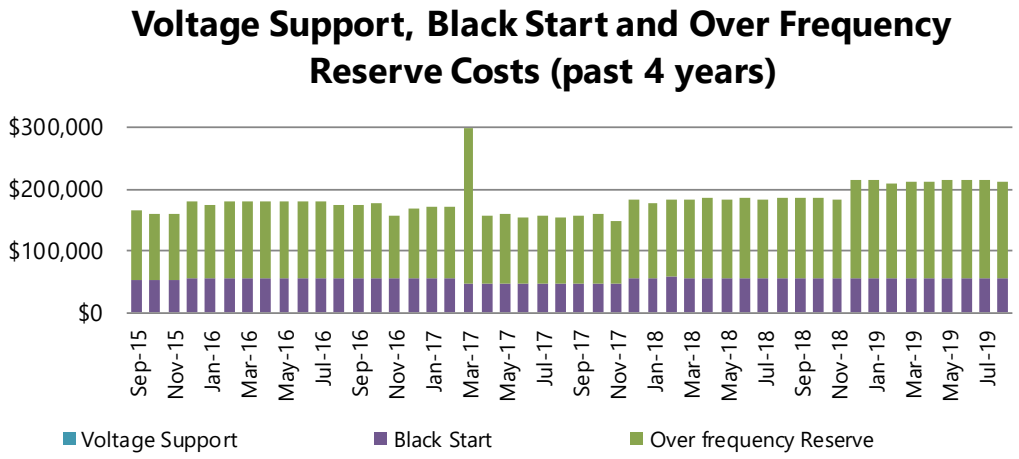
The overall ancillary service costs in August are of the same magnitude as in July. In August the costs were $2.86 million, compared to $2.81 million in July, both a significant decrease from June when there were high instantaneous reserves costs.



Instantaneous Reserve costs decreased this month by $112.4 k (7%) to $1.57 million. This is primarily due to a reduction in interruptible load, as the spinning reserve costs increased. On 5 August, the price of instantaneous reserves (both fast and sustained) rose above $200/MWh compared to the more typical prices of less than $10/MWh. This situation was driven by the highest peak load of the year pushing energy and reserve prices up; at 10am when the reserve supply was tight, coupled with high energy prices ($545/MWh), the SIR price cleared at $348/MWh.



This month's frequency keeping costs have increased by $156k to $1.076M. The majority of this change was due to a change in North Island constrained off costs which increased by $145k.



This month the availability fee paid for Over Frequency Reserves was lower than the contracted value of $159k as one of the contracted units was unavailable.

14 Commissioning and Testing

We are in discussions with Tilt (Waverley) and Mercury (Turitea) on generation asset information for their new windfarms.

The Junction Road gas turbine generating station, being commissioned near Carrington Street substation in New Plymouth (NPL), cannot begin generation until NPL T8 is decommissioned as part of the Taranaki project works needed to exit NPL substation. Any delays could impact on generator commissioning.

Black start testing

We worked with Meridian to successfully complete the Aviemore black start test. This included successful demonstration of the remote synchronisation functionality.

15 Operational and system events

There was a short HVDC Pole 2 outage during the early hours of 2 August due to an issue with the water cooling system. We issued a customer advice notice (CAN).

A grid emergency notice (GEN) was issued on 5 August to enable a Silverdale transformer (T1) to be removed from service due to loading issues (particularly cold weather coupled with a load shift from Albany). Silverdale load was initially picked up by a second Silverdale transformer (T2) until a temporary replacement was installed while the normal transformer undergoes repair.

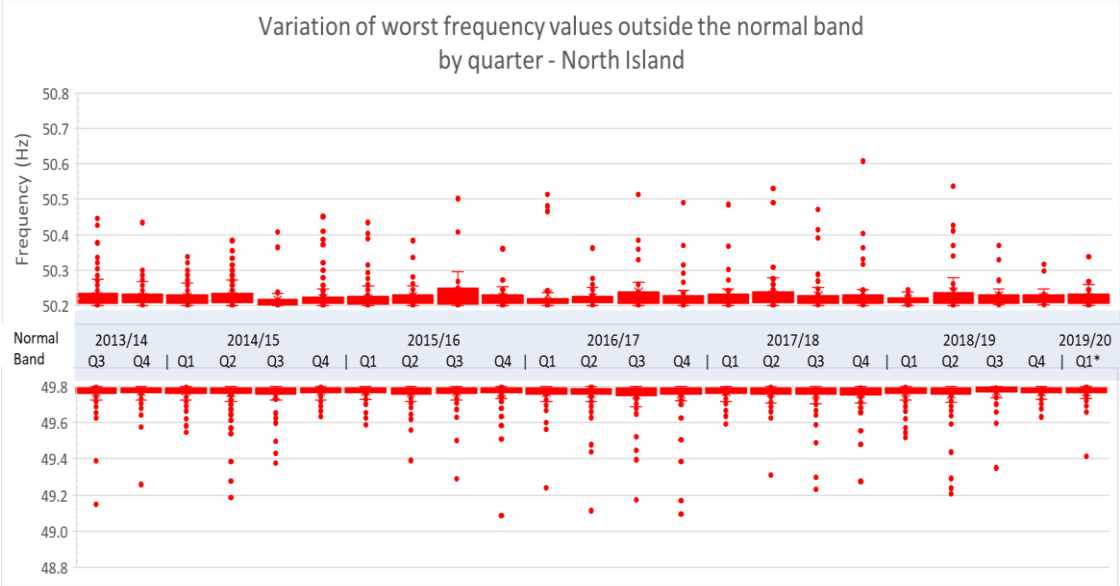
We issued our first two CANs on low residual situations in August, both for Monday morning peaks. We introduced these notifications to improve information to the market following our experiences during the November 2018 HVDC outages. We closely monitored actual loads and intermittent generation (particularly wind). Whilst prices were high (around $650/MWh at peak for the first instance), in real time normal reserve requirements were able to be met, due in part to participant response to the CAN.

16 Frequency fluctuations

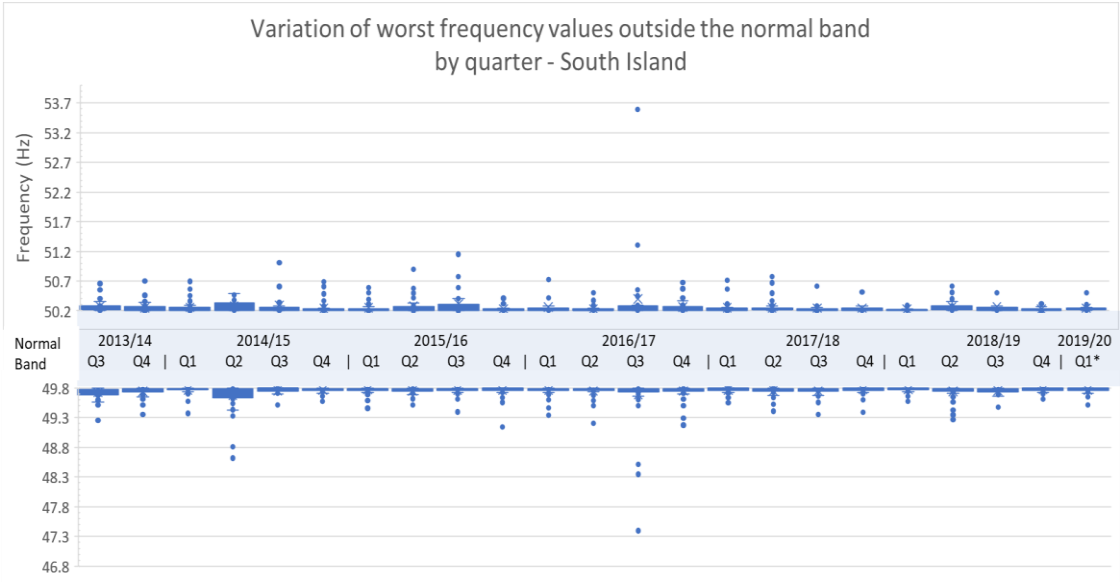
16.1 Maintain frequency in normal band (Frequency value)

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



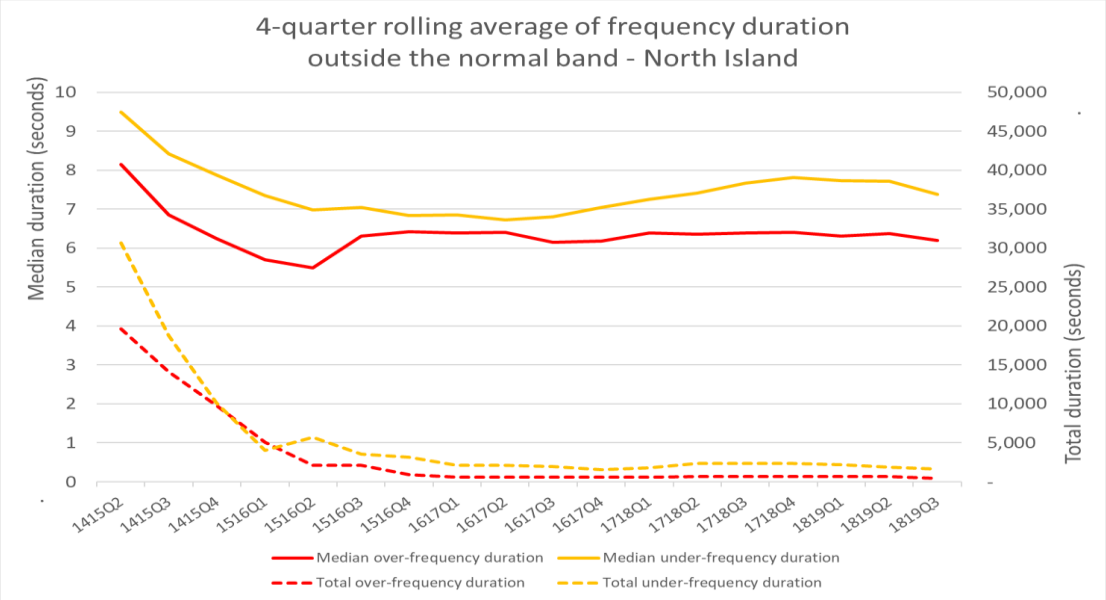
* 2019/20 Q1 contains data for July and August only

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.

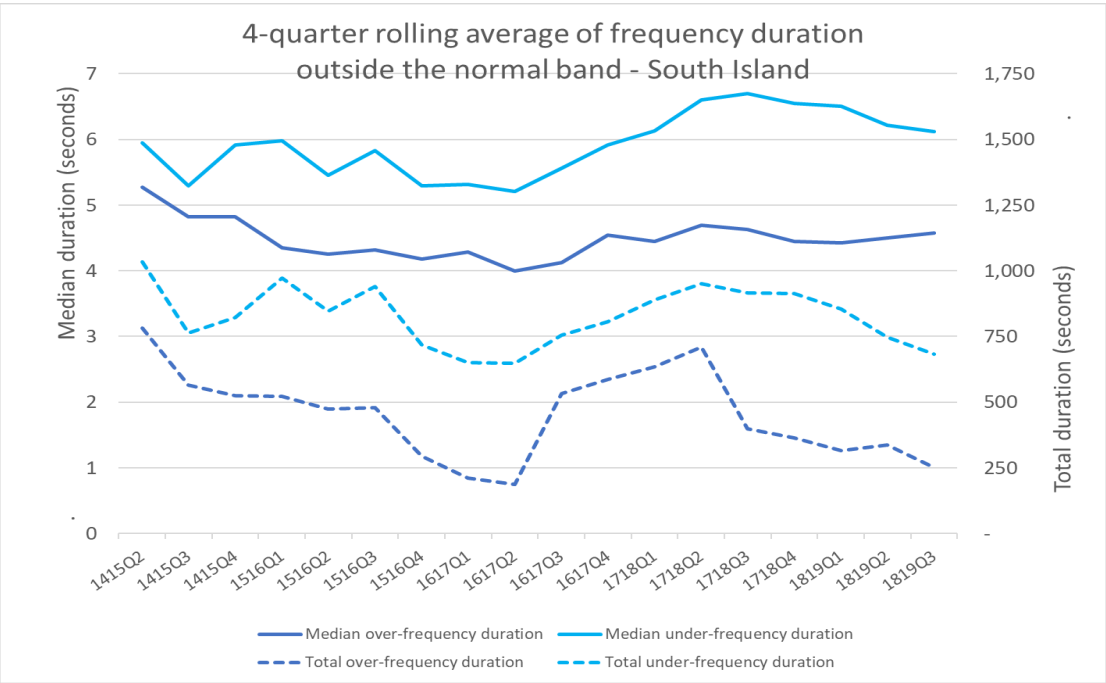
16.2 Recover quickly from a fluctuation (Time)

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

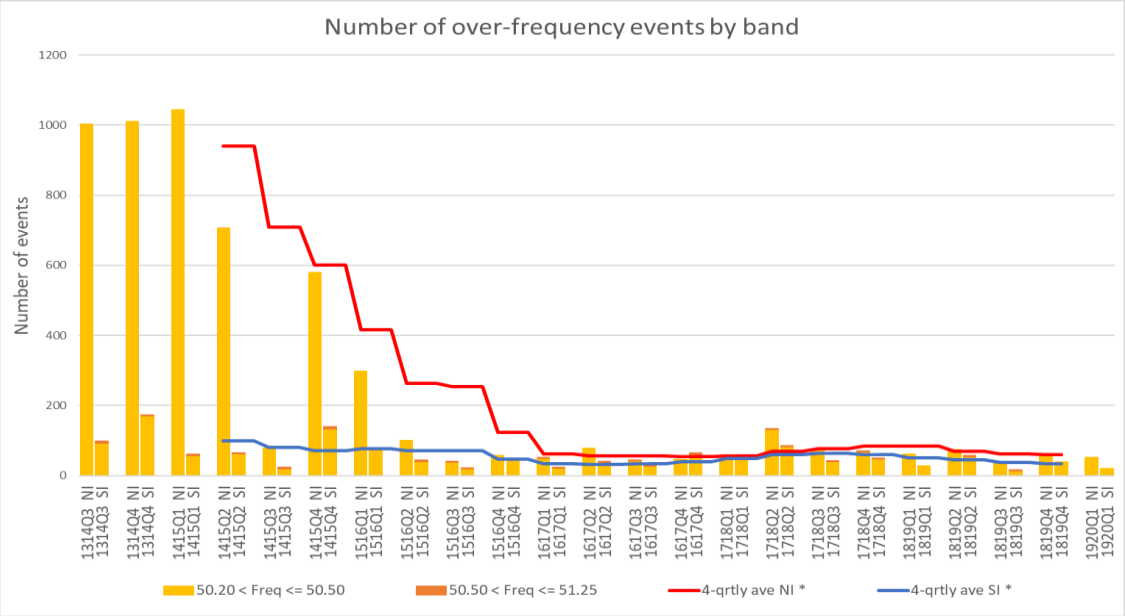


* These graphs have not been updated since 2018/19 Q4; they will only be updated at the end of each quarter

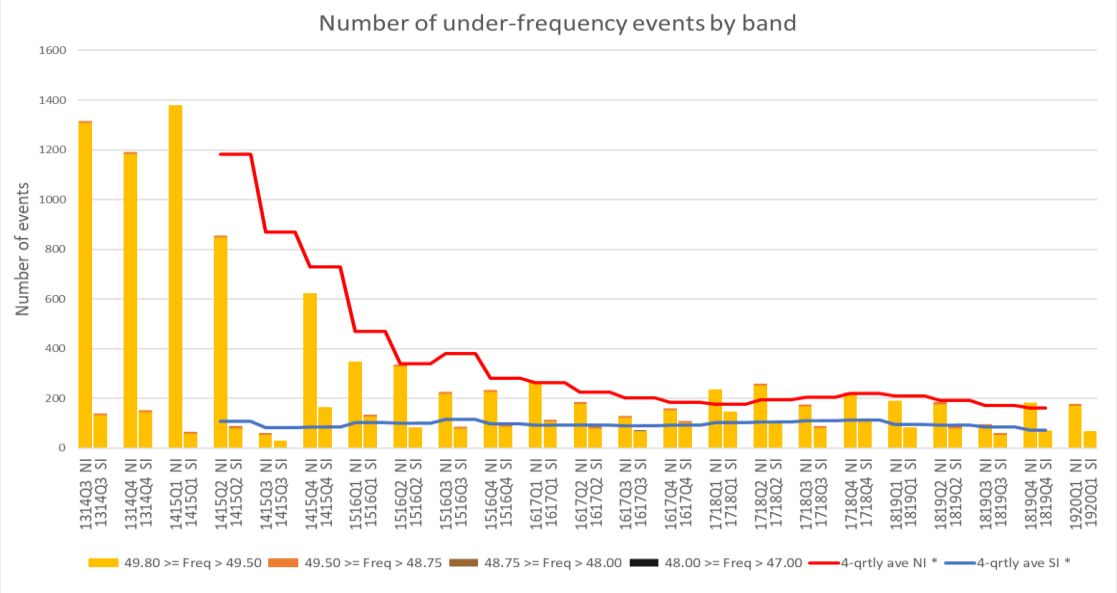
16.3 Manage frequency and limit rate of occurrences during momentary fluctuations (Number)

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 and August only.

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

16.4 Manage time error and eliminate time error once per day

There were no time error violations in the reporting period.

17 Voltage management

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

18 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	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19
Demand Allocation Notice	-	-	-	-	-	-	-	-	-	-	-	-
Grid Emergency Notice	-	-	-	-	-	-	1	-	-	-	-	1
Warning Notice	-	-	1	-	-	-	-	-	-	1	-	-
Customer Advice Notice	9	6	20	20	16	6	7	4	8	17	9	14

19 Grid emergencies

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

Date	Time	Summary Details	Island
05/08/19	18:05	A grid emergency was declared to reconfigure the grid to allow Silverdale Supply Transformer T1 and 220 kV Albany-Silverdale Circuit 1 to be removed from service. This was done in order to manage the potential for Silverdale T1 to be overloaded following a tripping of 220 kV Albany-Silverdale Circuit 2.	N

Appendix A: Discretion

Event Date and Time	Description
07-Aug-2019 10:07:28	HWA1101 PTA3: Required for HWA_WVY split closed for voltage support Last Dispatched MW: 0
08-Aug-2019 09:44:42	HWA1101 PTA1: Required for HWA_WVY split closed for voltage support Last Dispatched MW: 0
08-Aug-2019 09:44:51	HWA1101 PTA2: Required for HWA_WVY split closed for voltage support Last Dispatched MW: 0
08-Aug-2019 09:44:58	HWA1101 PTA3: Required for HWA_WVY split closed for voltage support Last Dispatched MW: 0
08-Aug-2019 10:01:39	HWA1101 PTA1: Required for HWA_WVY split closed for voltage support Last Dispatched MW: 0
08-Aug-2019 10:01:50	HWA1101 PTA2: Required for HWA_WVY split closed for voltage support Last Dispatched MW: 0
08-Aug-2019 10:01:59	HWA1101 PTA3: Required for HWA_WVY split closed for voltage support Last Dispatched MW: 0
08-Aug-2019 10:43:17	HWA1101 PTA1: Required for HWA_WVY split closed for voltage support Last Dispatched MW: 11
08-Aug-2019 10:43:23	HWA1101 PTA2: Required for HWA_WVY split closed for voltage support Last Dispatched MW: 11
08-Aug-2019 10:43:27	HWA1101 PTA3: Required for HWA_WVY split closed for voltage support Last Dispatched MW: 11
27-Aug-2019 06:57:47	WHI2201 WHI0: Morning ramp up, keep unit sync'd. Last Dispatched Mw: 25
27-Aug-2019 07:02:42	WHI2201 WHI0: Morning ramp up, keeping unit sync'd Last Dispatched Mw: 25. Constrained on for 1 dispatch only at 07:04, after which it was assessed WHI was not required after all, Discretion ended at 07:06, WHI dispatched off at 07:08.

Event Date and Time	Description
28-Aug-2019 06:58:04	ARG1101 BRR0: To allow switching of ARG_BLN_1 Last Dispatched MW: 11
28-Aug-2019 12:56:14	ARG1101 BRR0: To allow for the return switching of ARG-BLN-1 Last Dispatched MW: 11