TRANSPOWER

MONTHLY SYSTEM OPERATOR AND SYSTEM PERFORMANCE REPORT

FOR THE ELECTRICITY AUTHORITY

Transpower New Zealand Limited

May 2019

Keeping the energy flowing




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Transpower New Zealand Limited The National Grid

Report Purpose

This report is Transpower's review of its performance as system operator for May 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

Key highlights this month include:

- We received excellent feedback from MEUG on our management of the May HVDC outage. We are continuing to work on coordinating the system operator aspects of the HVDC 2020 outages.
- We are working with the Authority to investigate a review of Planned Outage Coordination Process (POCP) to consider whether it can have broader application.
- Black start capability testing was successfully completed at Maraetai (MTI) on Saturday 4th May.
- Security of supply is in good shape with both hydrology and gas in healthy supply.
- Monthly ancillary service costs decreased by 18% in May, mainly due to a decrease in Instantaneous Reserve costs, reflecting continued decline in the cost of fuel.

2 Compliance

We reported one breach during May. This related to a delay in publishing the forward-looking schedules during the daylight-saving switch-over in April. A timestamp clash along with challenging system conditions meant a re-run of the long schedule did not complete in the time-frame required by the Code.

Six reported breaches are still being considered by the Authority's Compliance committee. 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.

3 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 project is preparing for Authority Board approval following the conclusion of the consultation period on 30 April. Transpower has now completed a refresh of the initial business case. The first consideration of the outcome of consultation will go to the Authority board on 6 June. Further Board meetings in late June and August are planned to seek approval of the project.

Dispatch Service Enhancements

Transpower has advised the Authority that the project is experiencing delays due to extended testing period. The project team is due to report back to the Authority on 19 June with a revised plan. In parallel, Transpower has been working with the Authority to prepare advice to the Authority Board regarding a decision on how participant transition costs will be managed during implementation of the project. Joint Transpower-Authority communications are planned to follow the decision, including publication of a transition planning document and draft dispatch agreement and policy that will underpin implementation

Wind Offers

The project is on track for delivery of changes by September. However, the commissioning date has been moved from 1 September because of changes to Dispatch Service Enhancement timelines. A revised commissioning date of 19 September has been submitted for approval by the Authority.

Situational Intelligence

A phase 2 business case to prove components of the situational intelligence platform was approved in late April. Work commenced with the preferred vendor, who has been working with the business to build platform for the first user case – around the Roxburgh special protection scheme. The team is ahead of schedule to complete the investigation scope by the end of July 2019.

Credible Event Review

We carried out analysis of the reserves impact of considering generator busbar risks (i.e. multiple unit losses) as contingent event or extended contingent events on both islands. This has identified that a tool change would be required to reflect the risk correctly for the market system. North Island results show a small number of scenarios where a reduction in the expected amount of AUFLS tripping could be achieved at a low cost, however, the event risk factors are very low. The project team are aiming to socialise trial busbar results and the methodology with industry by the end of June.

Other projects

During the last period approval was obtained to commence the Operational Planning Enhancement, Tactical Alarms Review, Telemetry Change Release and the second stage of the National Co-ordination Centre (NCC) Voltage Automation project. Both the Digital Switch Management and Modelling Explorer Tool (MET) project are well advanced, with 3 releases already been delivered for MET.

4 Outage planning and coordination

HVDC 2020 Outages

We are continuing to work on coordinating the system operator aspects of the HVDC 2020 outages. This includes continued monitoring of scenarios to estimate the

generation balance margins during the outages. These scenarios include a gas shortage and minimal wind generation – particularly during the four bipole outages. We are meeting regularly with the HVDC team to discuss associated risks. We will be providing further information and the opportunity for participants to discuss the outages at a briefing in the last week of July.

5 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.

6 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.

7 Cost-of-services reporting

The feasibility study into implementing annual cost-of-services reporting to the Authority is required in financial year 2 (SOSPA 12.6). This was completed in September 2017. Reporting will start in the 2019/20 year.

8 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.

9 Separation of Transpower roles

Since the creation of the Operations division and implementation of Transpower-wide training on role impartiality and conflict of interest, we have had a number of issues raised on the conflict of interest register. These issues are being handled in accordance with Transpower's policy for managing conflicts of interest.

Two new issues were raised in the conflict of interest register in May: -

- As system operator we provided a view on the need for Waikato and Upper North Island Voltage Management investment to resolve forecast transient overvoltage risk. This has been closed now that the view has been shared with the grid owner;
- The Authority raised a concern regarding perceived favourable treatment of the grid owner in the system operator's recommendation of causer for the under-frequency event of 14 December 2018.

A full list of reported issues, including closed actions, will be provided in the next quarterly report.

10 Customer

Planned Outage Coordination Process review

We provided a draft recommendation to the Authority regarding coordinate of a review of Planned Outage Coordination Process (POCP). The last review was carried out in 2013 and feedback from industry at our annual outage forum was supportive of a further review. The review will cover the functionality of the system, but we expect discussions around the mandatory use of POCP to disclose outages and inclusion of gas outages into POCP will be hot topics.

System performance

11 Commissioning and Testing

Blackstart Testing – Maraetai Power Station

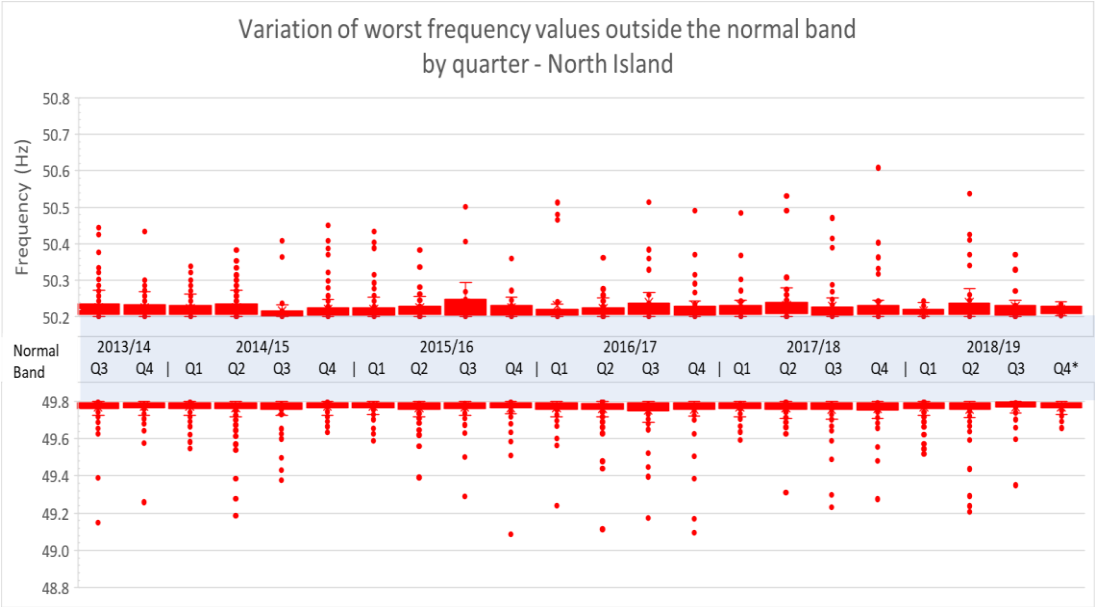
Black start capability testing was successfully completed at Maraetai (MTI) on Saturday 4th May. The last black start test of MTI was completed in 2015, and this was the first black start test since the installation of a bus coupler at MTI.

12 Frequency fluctuations

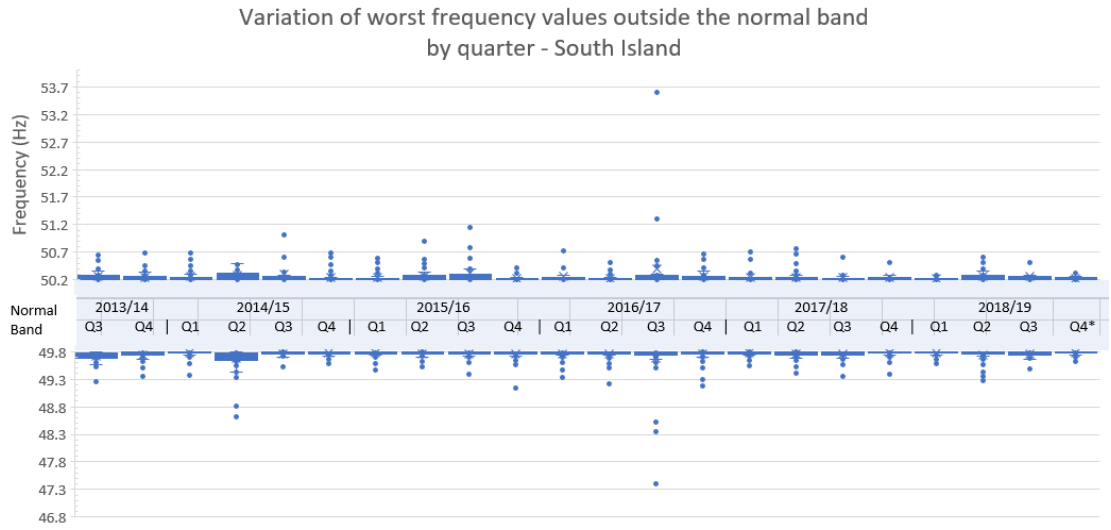
12.1 Maintain frequency in normal band (Frequency value)

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



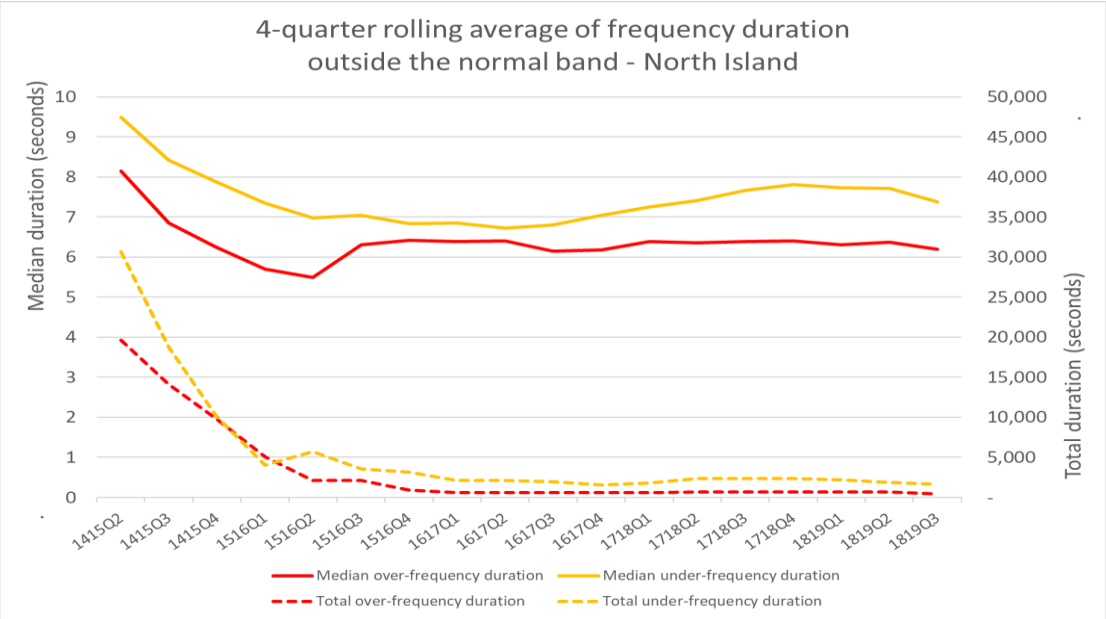
* 2018/19 Q4 contains data for April and May only

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.

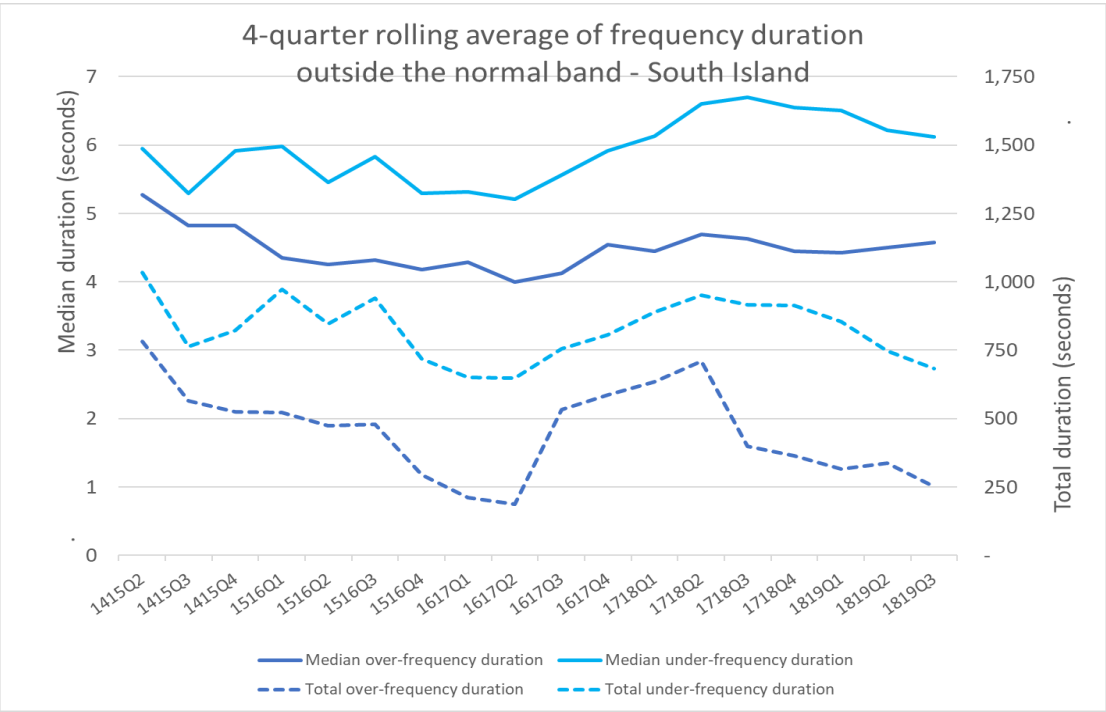
12.2 Recover quickly from a fluctuation (Time)

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

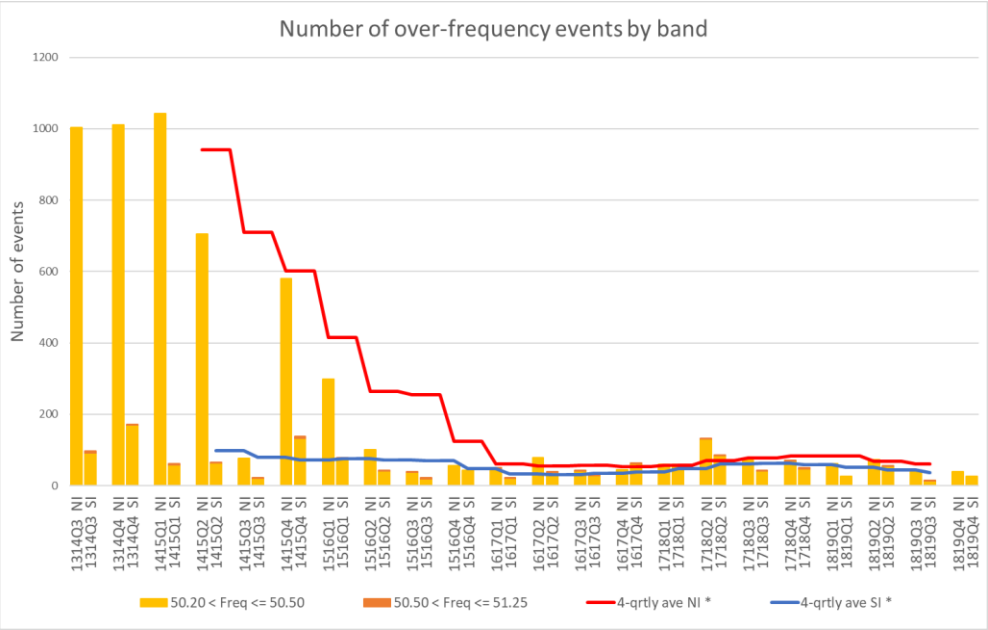


* These graphs have not been updated since 2018/19 Q3; they will only be updated at the end of each quarter

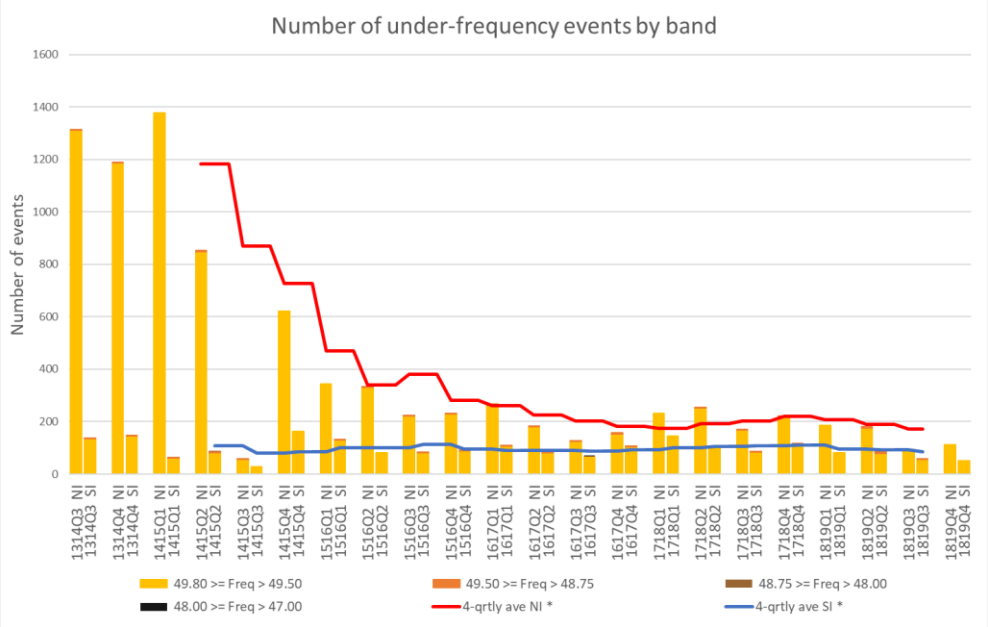
12.3 Manage frequency and limit rate of occurrences during momentary fluctuations (Number)

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 2018/19 Q4 contains data for April and May only.

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

12.4 Manage time error and eliminate time error once per day

There were no time error violations in the reporting period.

13 Voltage management

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

14 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	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19
Demand Allocation Notice	-	-	-	-	-	-	-	-	-	-	-	-
Grid Emergency Notice	-	-	1	-	-	-	-	-	-	1	-	-
Warning Notice	1	1	-	-	-	1	-	-	-	-	-	-
Customer Advice Notice	4	2	9	9	6	20	20	16	6	7	4	8

15 Grid emergencies

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

Date	Time	Summary Details	Island
		None this month.	

16 Security of supply

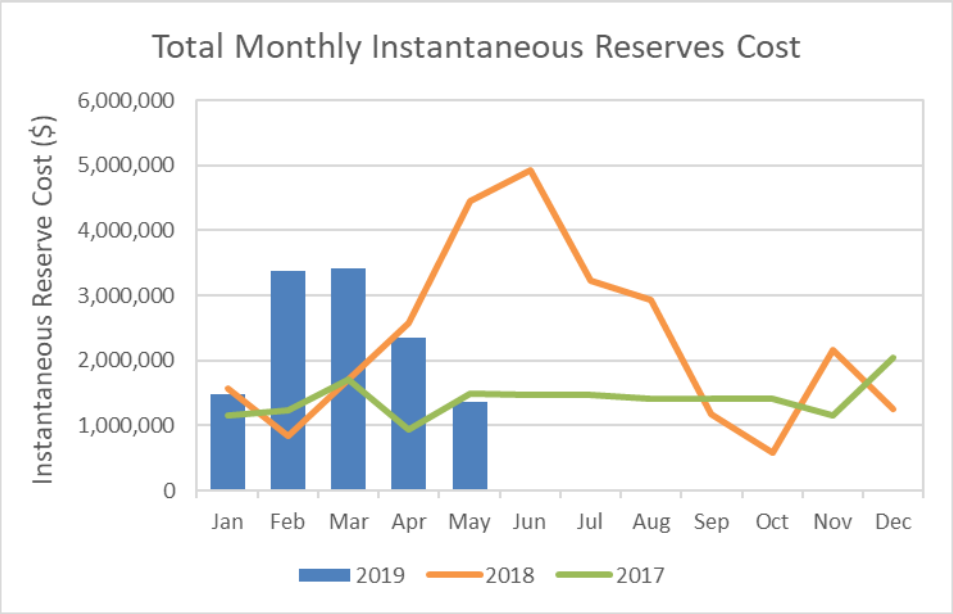
National storage remained steady throughout most of May, and North Island storage continued to decline, until a major rainfall event occurred across the country at the end of May. This caused even further increase to the already high South Island storage levels (at 127% of average), while North Island storage received a much-needed boost (now at 81% of average).

With the return to service of the Kupe and Pohokura gas fields at the end of May, the amount of gas available for electricity generation was restored to normal. This is the first time since September that both hydrology and gas have been in healthy supply at the same time.

17 Ancillary services

Monthly ancillary service costs decreased by 18% in May. This month they were $3.15 million, a decrease of $577k from last month.

The largest decrease was for Instantaneous Reserve costs which decreased by $981k (72%) to $1.37 million, reflecting continued decline in the cost of fuel following the increase in hydro storage and resolution of the gas supply issues in February through April.



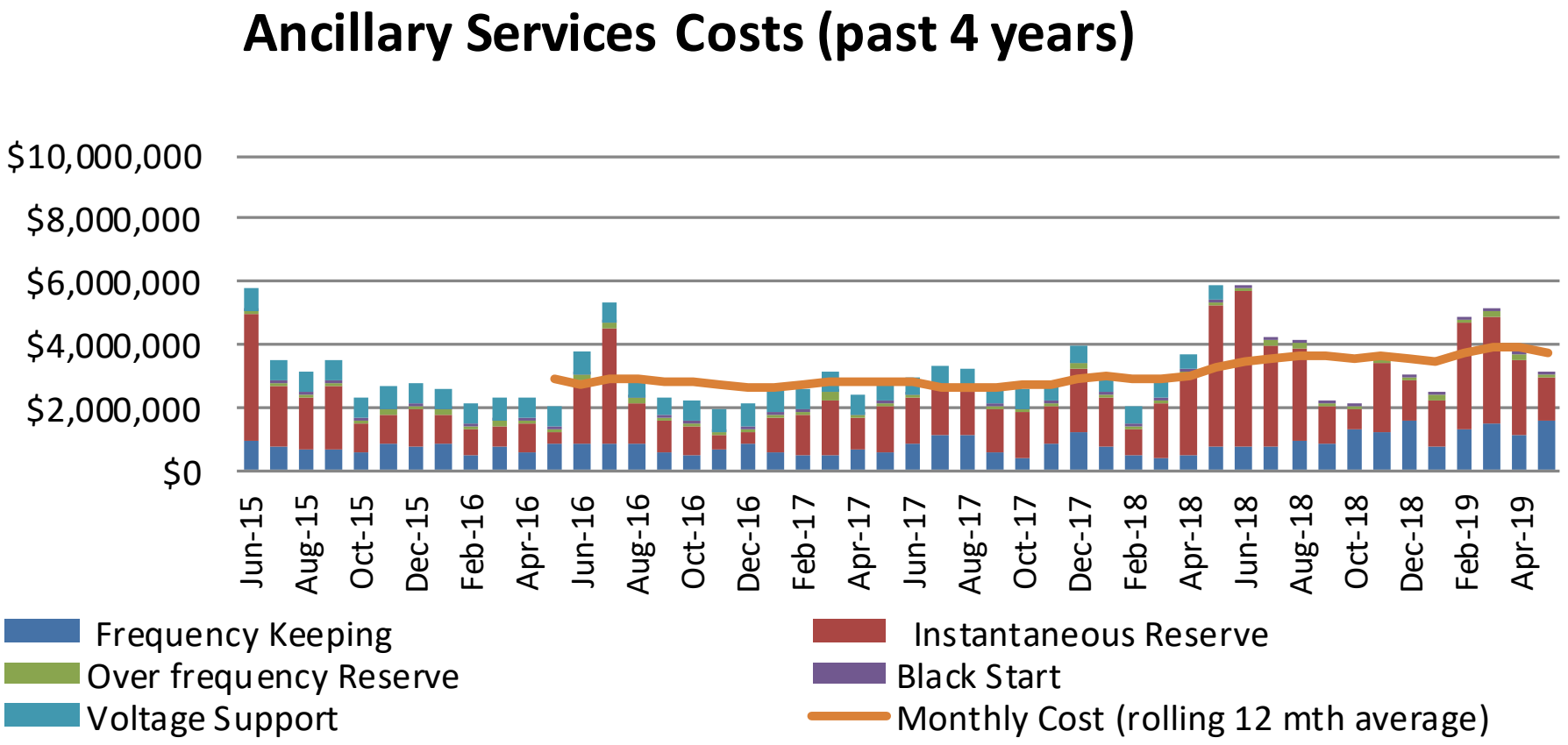
This month's frequency keeping costs increased by $401k (26%) to $1.568 million. This includes an increase in the procurement of Frequency Keeping (+$421k), as well as a small increase for constrained on (+52k), offset by a decrease in constrained off (-$72k) costs.

Refer to Appendix B for more detailed Ancillary Services graphs.

Appendix A: Discretion

Event Date and Time	Description
01-May-2019 18:00:57	HLY2201 HLY5 : Required for offload violations due to TKU_WKM_1 outage and slow ramping plant.
01-May-2019 18:27:20	HLY2201 HLY5 : Required for offload violations due to TKU_WKM_1 outage and slow ramping plant
01-May-2019 18:52:33	HLY2201 HLY5 : Required for offload violations due to TKU_WKM_1 outage and slow ramping plant
03-May-2019 14:00:08	ARG1101 BRR0 : Return to Service ARG_KIK_1
20-May-2019 06:28:05	ARG1101 BRR0 : Power System Operation on BLN_KIK cct
24-May-2019 15:29:28	ARG1101 BRR0 : To allow return of ARG_BLN circuit.
31-May-2019 13:01:59	ARG1101 BRR0 : Discretion to allow ARG_BLN cct return.

Appendix B: Ancillary Services Graphs



Frequency Keeping (past 4 years)