

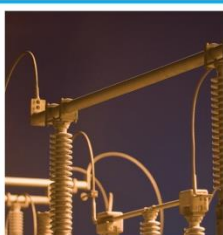
MONTHLY SYSTEM OPERATOR AND SYSTEM PERFORMANCE REPORT

FOR THE ELECTRICITY AUTHORITY

Transpower New Zealand Limited

May 2018

Keeping the energy flowing



TRANSPOWER



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Report Purpose

This report is Transpower's review of its performance as system operator for May 2018, 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).

Commentary

This section highlights successful management of significant events and operational issues by the system operator. It provides additional commentary (not Code or SOSPA required) relating to aspects of system operator performance or system performance. The remainder of the report provides supporting detail (which is Code or SOSPA required) in two sections:

- System operator performance, and
- System performance.

Organisational changes – May was the first month of the new organisational structure where much of the System Operator role is delivered as part of a new wider Operations division within Transpower. Recruitment for key roles continues and revised processes for role impartiality are being addressed.

SI AUFLS - Work with the Authority on the March 2017 Transpower South Island AUFLS report focuses on development of a set of actions. It is intended that the Transpower report on this event will be provided to a special SOC meeting and then released publicly in July.

Energy Futures - Transpower launched its Energy Futures document with scenarios based on significant electrification supplied from renewable sources. System operator resources will assist with future workstreams to better understand the security of supply implications and the dynamic performance of an evolving power system with a greater proportion of variable and intermittent generation.

Security of Supply - We are currently consulting on the issue of thermal fuel limitations affecting security of supply risk. We are proposing to make no changes to the standard assumptions regarding thermal fuels but will monitor thermal fuel supply more closely.

SSF Review - A review of the grid and system changes since the last System Security Forecast (SSF) was completed has been undertaken. Changes identified are minor and as such the System Operator has concluded that a minor update to the SSF is not warranted. A major SSF review will commence in July and is scheduled for delivery by December 2018.

Planned Grid Outages - The current high workload in May and June in assessing and planning for grid maintenance outages is requiring considerable planning and collaboration to ensure we can facilitate outages while achieving system security requirements with the higher winter time loads.

Commissioning - There is also a significant commissioning workload in the coming months both in the testing of generation plant and commissioning of a significant grid upgrade project at Gore which resolves grid constraints in the Southland region.

System operator performance

1 Compliance

Two breaches were reported in May by the system operator. The first relates to a change to offer which was not acknowledged correctly and was not then used in the forward looking schedules, this error reached real time causing a market impact of less than \$500. The second relates to a modelling error that removed a generators offers from the forward looking schedules, this was identified before real time and corrected before dispatch..

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

2 Market design and system enhancement project updates

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

Efficient Procurement of Extended Reserves

Industry stocktake is underway and planned for completion in early June. This involves interviews with all the north island distributors to determine their capability to transition to the 4 block scheme. A transition risk assessment is also underway and looks to be much simpler than originally planned. Outside of these Authority funded activities, a review of the Technical Requirements Schedule (TRS) is making good progress with the analysis to date showing the 4 block scheme performs well.

The approved capital project associated with this work is complete.

Real Time Pricing (RTP)

With delivery phase funding for RTP not being approved, focus has been on closing out the current phase of the project and working with the Authority on the scope of RTP related work that is to continue. A brief change request will be submitted to amend the scope accordingly. The final Capex Plan commencing 2018/19 to be delivered to the Authority this month will be revised to amend timing of the RTP project.

Dispatch Service Enhancement

The Delivery Business Case was developed and internally endorsed by Transpower. Transpower is currently awaiting the Authority's funding approval to commence the delivery phase. The EA, in collaboration with the project team, completed the Code consultation on 22 May. Transpower has provided their response summary report, which the EA will use for the August Board meeting to approve the Code changes. Time and cost of this work aligns with the current Capex Plan.

3 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.

4 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.

5 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 refers). This was completed in September last year and a proposed approach submitted to the Authority for their feedback.

6 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.

7 Impartiality of Transpower roles

As system operator, Transpower has not been materially affected by any other role or capacity Transpower has under the Code or under any agreement.

Updated training module development has been completed for conflict of interest across Transpower and will be released to staff late June. The Transpower procedure for conflict of interest has also been updated. A review is being planned by and external provider to consider training, process, procedures and to assess effectiveness of our measures around impartiality of roles. This review is expected to commence in June.

System performance

8 Operational and system events

On 14th May the Otahuhu_Roskill_1 & 2 circuits were removed from service because of a climber on one of the towers. The person was talked down and taken to hospital and there were no supply impacts. Following this event, the tower climber procedure has been finalised and formally introduced to clearly guide our grid owner control room staff on the initial response to a call advising of a climbing event.

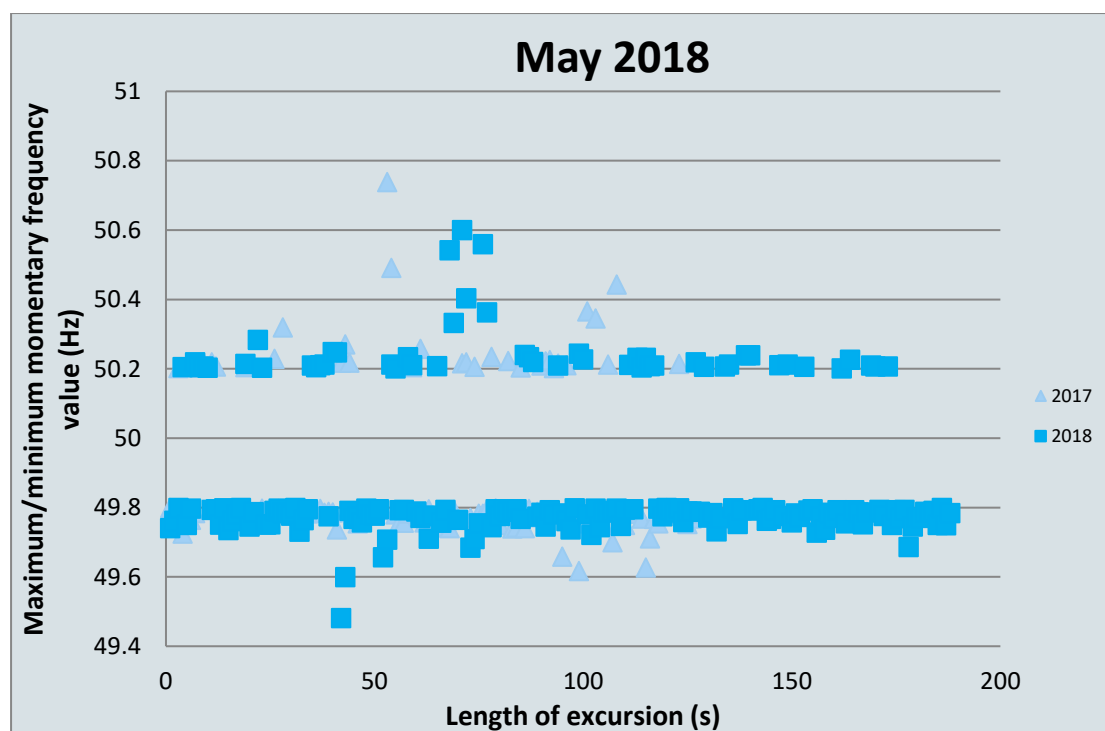
A widespread, extensive series of storms with significant lightning during the week commencing 18th May resulted in a substantial number of circuit trippings – one of which involved a loss of supply of 35MW to Powerco customers.

9 Frequency fluctuations

Please note that refinements to the frequency reporting are underway in conjunction with the Authority.

9.1 Maintain frequency in normal band and recover quickly from a fluctuation

The chart below shows the maximum or minimum frequency reached and length of each frequency excursion outside the normal band (49.8 to 50.2 Hz) during the reporting period.



9.2 Maintain frequency and limit rate occurrences during momentary fluctuations

The tables below show the total number of momentary fluctuations outside the frequency normal band, recorded in each island, for each month over the last 12 months and the 12 month cumulative totals, grouped by frequency band.

North Island:

Frequency Band	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Annual rate
55.00 > Freq >= 53.75													
53.75 > Freq >= 52.00													
52.00 > Freq >= 51.25													
51.25 > Freq >= 50.50							1				1		2
50.50 > Freq >= 50.20	22	6	22	31	41	85	5	23	19	30	20	30	334
50.20 > Freq > 49.80													
49.80 >= Freq > 49.50	42	52	92	89	91	135	27	53	57	62	71	87	858
49.50 >= Freq > 48.75	3						1		2	1		1	8
48.75 >= Freq > 48.00													
48.00 >= Freq > 47.00													
47.00 >= Freq > 45.00													

South Island:

Frequency Band	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Annual rate
55.00 > Freq >= 53.75													
53.75 > Freq >= 52.00													
52.00 > Freq >= 51.25													
51.25 > Freq >= 50.50	1		2	1	1		1			2	1	3	12
50.50 > Freq >= 50.20	28	11	17	28	29	47	8	13	12	16	14	18	241
50.20 > Freq > 49.80													
49.80 >= Freq > 49.50	45	36	50	58	46	42	13	32	24	29	38	49	462
49.50 >= Freq > 48.75	2						1		2	1			6
48.75 >= Freq > 48.00													
48.00 >= Freq > 47.00													
47.00 >= Freq > 45.00													

9.3 Manage time error and eliminate time error once per day

There were no time error violations in the reporting period.

10 Voltage management

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

11 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-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18
Demand Allocation Notice	-	-	-	-	-	-	-	-	-	-	-	-
Grid Emergency Notice	-	-	1	-	-	1	-	3	1	-	1	1
Warning Notice	-	-	-	2	-	-	1	-	-	-	-	-
Customer Advice Notice	23	2	6	6	1	8	1	3	6	4	10	12

12 Grid emergencies

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

Date	Time	Summary Details	Island
2-May-18	16:33	A grid emergency was declared at Rotorua to assist with restoration of supply following a fault.	N

13 Security of supply

During May, North Island inflows were 142% of average and South Island inflows were 103% of average.

National hydro storage increased from 122% to 129% of average for the time of year over the month. The hydro risk status remains at 'Normal'.

14 Ancillary services

There has been some interest from ancillary services participants on battery energy storage systems (BESS) announcement from the Authority. We expect this announcement would encourage increased battery developments in the market.

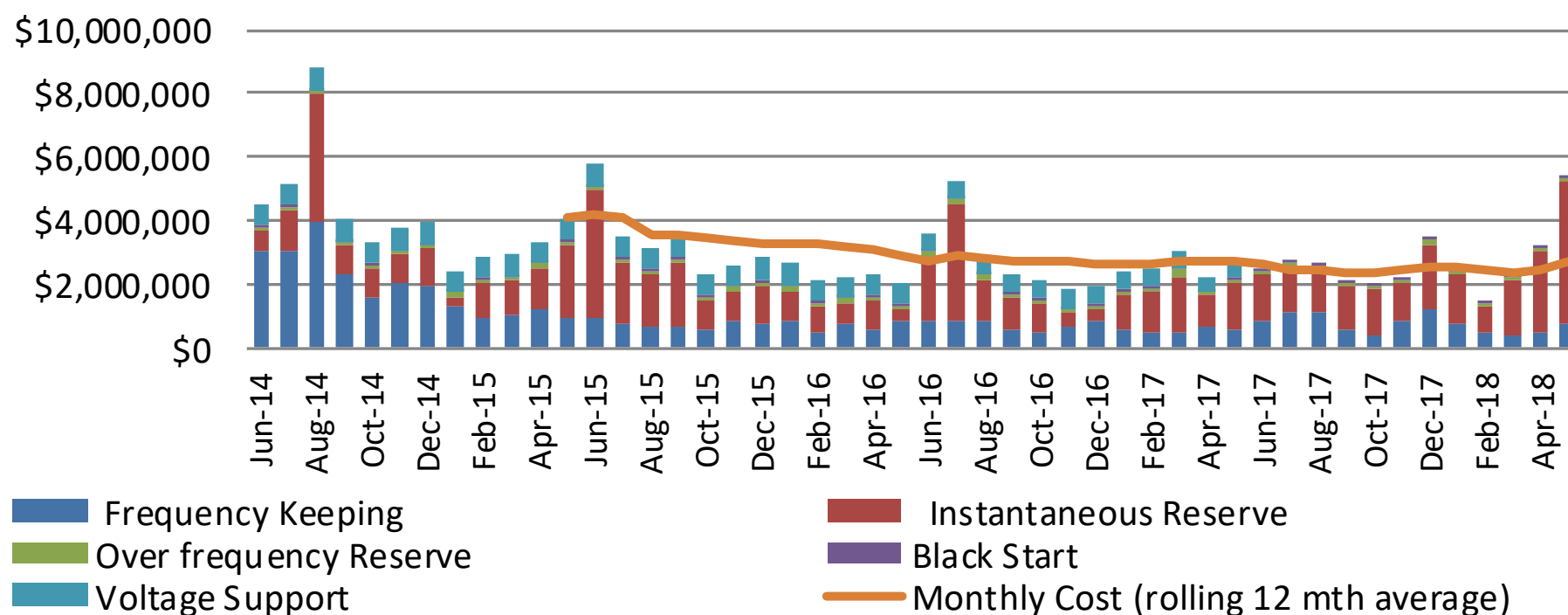
Refer Appendix B for Ancillary Services Graphs.

Appendix A: Discretion

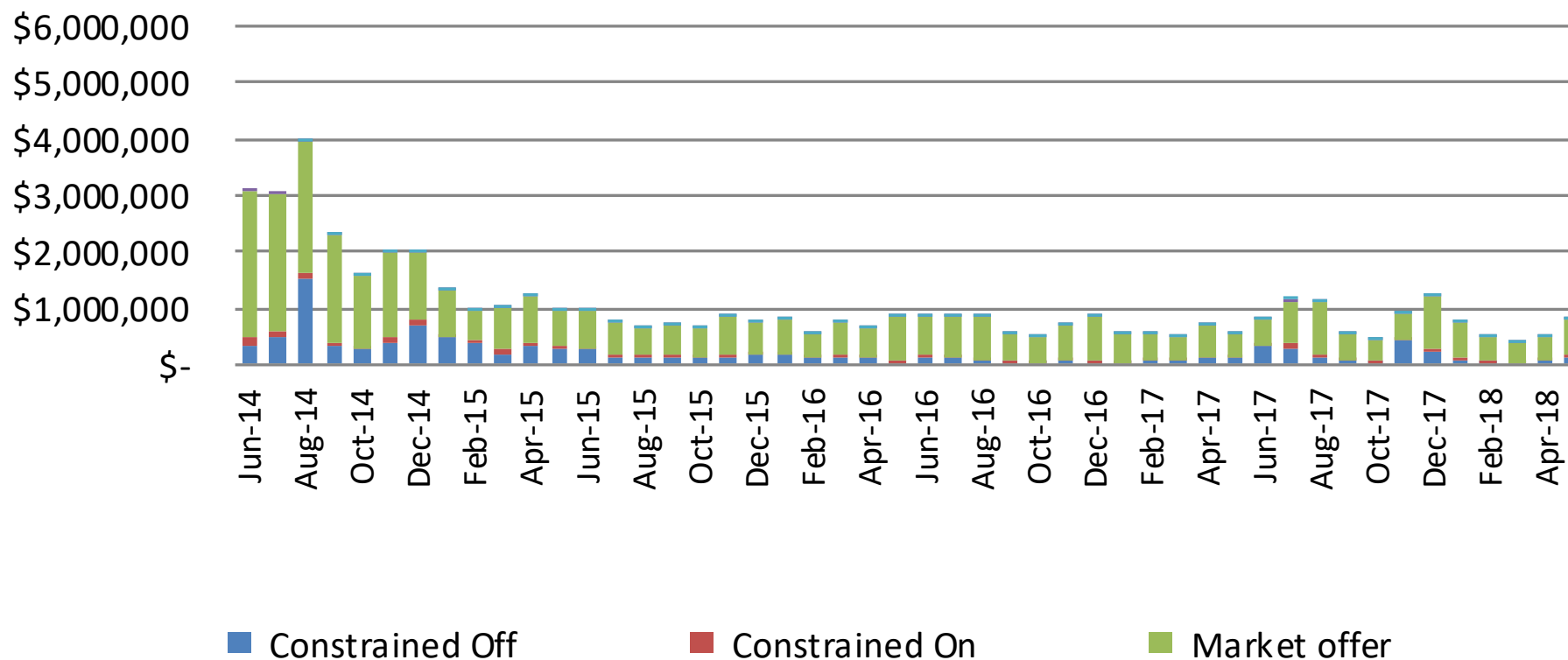
Event Date and Time	Event Description
05-Apr-2018 11:42:41	MAN2201 MAN0 Tiwai Aluminium Smelter line 2 extended offload.
09-Apr-2018 11:56:33	MAN2201 MAN0 Restoration of extended potline
09-Apr-2018 12:02:05	MAN2201 MAN0 Restoration of extended potline.
10-Apr-2018 07:19:52	KPA1101 KPI1 OPK_KPI_SFD tripping
10-Apr-2018 07:50:38	HWA1101 PTA1 HAW bus islanded.
10-Apr-2018 07:50:54	HWA1101 PTA2 HAW bus islanded.
10-Apr-2018 07:51:12	HWA1101 PTA3 HAW bus islanded
10-Apr-2018 12:53:15	HLV2201 HLY2 HLY 2 tripping.
12-Apr-2018 07:38:33	WHI2201 WHI0 : Required for System Security
12-Apr-2018 07:46:00	WHI2201 WHI0 : Required for System Security
12-Apr-2018 18:06:39	WHI2201 WHI0 : End of Discretion
12-Apr-2018 18:08:01	WHI2201 WHI0 : End of Discretion
16-Apr-2018 15:30:28	MAN2201 MAN0 To provide capacity for reduction line restoration
19-Apr-2018 11:37:39	MAN2201 MAN0 Extended potline line 2
19-Apr-2018 15:43:33	HLV2201 HLY6 Huntly 6 tripped.

Appendix B: Ancillary Services Graphs

Ancillary Services Costs (past 4 years)



Frequency Keeping (past 4 years)



Instantaneous Reserve (past 4 years)

