SO MONTHLY OPERATIONAL AND SYSTEM PERFORMANCE REPORT

FOR THE ELECTRICITY AUTHORITY

Transpower New Zealand Limited
January 2017

Keeping the energy flowing




TRANSPOWER

Transpower New Zealand Limited The National Grid

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Report Purpose

This report is Transpower's review of its performance as system operator for January 2017, in accordance with clause 3.14 of the Electricity Industry Participation Code 2010 (the Code).

Operational issues and a detailed system performance report (Code-obligated) are provided for the information of the Electricity Authority (Authority).

1 Operational and system performance update

HVDC

Special operational arrangements were put in place in December to manage risk associated with an earthquake-damaged HVDC tower in the Marlborough region. The HVDC was reclassified as a CE risk for periods when winds were forecast above 80 km/h. For Transpower, the impacts of this were significant, requiring special wind forecasts for affected areas, devising and monitoring a new operational procedure at both asset and system management control rooms, planning for and carrying out the construction of the temporary towers, and managing a bi-pole outage to allow the work to be undertaken.

These operational arrangements continued through January until construction of two temporary towers was complete. The permanent replacement tower will be built and brought into service later in 2017.

Fires

A number of fires close to transmission assets occurred during January affecting Ohaaki and Nga Awa Purua substations and a tower on the OTA_WKM (Otahuhu-Whakamaru) 1 and 2 circuits.

Maraetai risk reclassification

'Bird activity' resulted in a trip of the Maraetai (MTI) bus on 8 January, removing 90MW of generation at MTI and 20MW at Waipapa. MTI has a history of bus trippings – many related to bird activity and vegetation issues. Transpower has undertaken a number of measures to mitigate these issues and additionally, has a project underway to install a bus coupler to sectionalise the bus and therefore limit future impacts.

In the meantime the risk of bus trip remains elevated, principally between September and February when bird activity is higher during the nesting season. A reclassification of the MTI bus risk during these periods (from ECE risk to a CE risk) was notified to industry. Transpower will reclassify the bus to normal status at the end of February 2017.

Opunake loss of supply

On 25 January, Opunake T5 tripped while Opunake T4 was on outage. This resulted in a loss of supply, potentially affecting Maui gas supply security. Service was restored after approximately 1 hour 20 minutes.

HVDC transfer post NMIR

Since launch there have been 400 trading periods (about 10% of the time) where price separation has been greater than 10%. The three types of causation are reserve sharing limits, round power, and the HVDC setting the binding risk. Price separation (above 10%) was not normally evident indicating that market participants have adapted to manage the risk of price separation with the tools available to them.

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 – The project completed consultation on the technical requirements schedule with industry. Comments have been considered and the technical requirements schedule is planned to be published on 14 February.

Gate Closure – This project will reduce gate closure time from 2 hours to 1 hour in the market system. The Gate Closure solution requirements gathering and high level solution design are progressing – solution requirements were approved and the high level design was reviewed and updated. Development, business process documentation review, and training development is progressing well. The project is on time and budget.

Real Time Pricing – Work continues on development of the market and systems changes associated with Real Time Pricing (RTP). Stakeholder requirements are complete and will now proceed to SLT approval. A second change request has been raised to extend the cost (hours) due to greater effort required to complete the technical review and the report review. The delivery date of the draft report remains at 15 February and the final report on 27 February.

National Market for Instantaneous Reserves – The project commissioned on schedule on 20 October with post go-live deployments completed by 8 December. Project close is underway.

EDF Phase III – This project will refresh the dispatch functionality within the market system to reduce barriers to entry and enable future dispatch products to be implemented. The investigation project was completed with an initial business case and associated consultation paper delivered to the Authority. The appropriation approval process is now underway. The capital phase of the project is planned to commence in 2017/18.

3 Security of Supply update

Inflows have been above average for January and storage levels were close to maximum at the end of the month. The hydro risk meter is set to normal.

For the month of January:

- North Island inflows were 98% of average[1]
- South Island inflows were 123% of average[2]
- hydro generation met 67% of demand.

As at 1 February, aggregate primary New Zealand storage was 127% of average.

4 Compliance update

Transpower as system operator reported three breaches of the Code in January. Two reports were delayed beyond usual timeframes by internal communication errors and resourcing difficulties, which have now been resolved.

In late April 2016 a block security constraint dispatch instruction was mistakenly sent to wind and thermal generating stations, but was resolved quickly resulting in no market impact. In May 2016 the HVDC link was modelled as being in reduced voltage mode incorrectly for ten hours, again resulting in no market impact. More recently, in December 2016 a non-response schedule failed to complete within the required time (due to an internal software error with a security application).

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

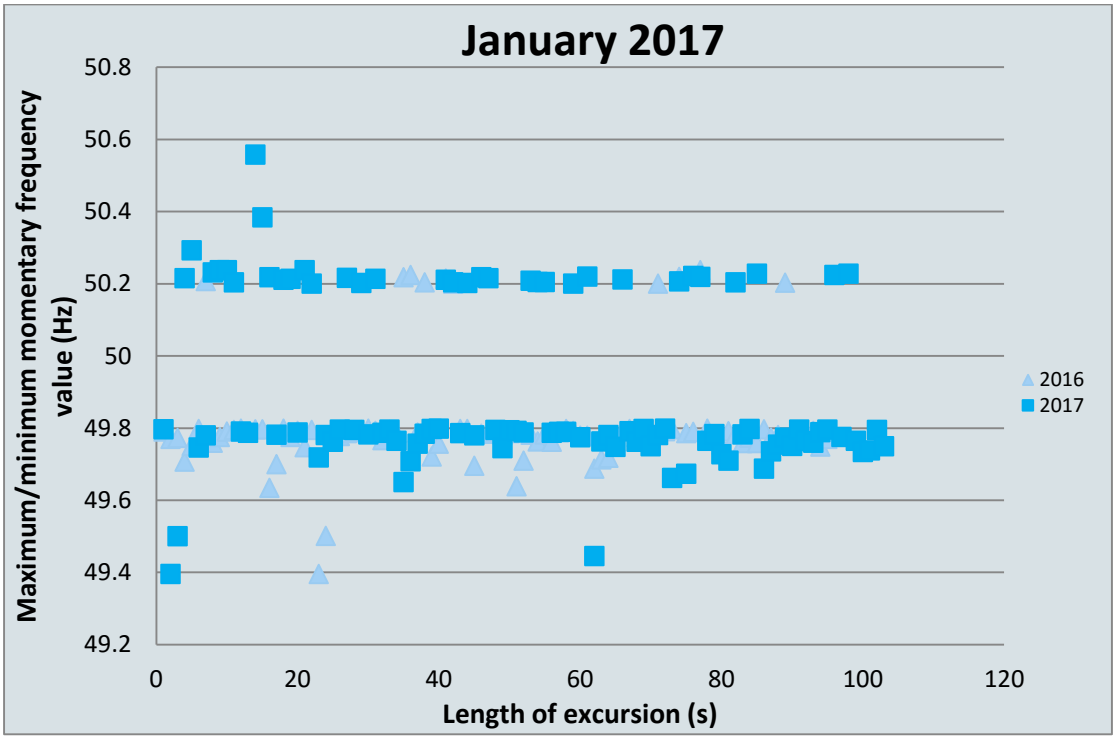
[1] Measurements are based on daily inflow values.
[2] Measurements are based on daily inflow values.

5 Operational management

5.1 Frequency fluctuations

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.



Maintain frequency and limit rate occurrences during momentary fluctuations

The table below shows the total number of momentary fluctuations outside the frequency normal band, recorded in both islands, over the last 12 months. The 12 month cumulative totals, grouped by frequency band, are compared to the frequency performance objective (PPO).

Frequency Band	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Annual rate	PPO target
55.00 > Freq >= 53.75														**0.2***
53.75 > Freq >= 52.00														**2***
52.00 > Freq >= 51.25														**7**
51.25 > Freq >= 50.50	1	3						2			1	1	**8**	**50**
50.50 > Freq >= 50.20	18	31	30	42	29	25	13	32	39	45	32	34	**370**	
50.20 > Freq > 49.80														
49.80 >= Freq > 49.50	101	118	125	106	89	128	102	153	101	101	59	67	**1250**	
49.50 >= Freq > 48.75		1		2		1		2	2	3	1	2	**14**	**60**
48.75 >= Freq > 48.00														**6**
48.00 >= Freq > 47.00														**0.2**
47.00 >= Freq > 45.00														**0.2**

***** South Island

Manage time error and eliminate time error once per day

There were no time error violations in the reporting period.

5.2 Voltage management

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

5.3 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	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17
Demand Allocation Notice	-	-	-	-	-	-	-	-	-	-	-	-
Grid Emergency Notice	2	2	2	5	2	3	2	1	2	-	-	-
Warning Notice	-	-	-	3	2	2	5	1	-	-	-	-
Customer Advice Notice	7	19	11	12	3	8	7	5	12	26	7	11

5.4 Grid emergencies

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

Date	Time	Summary Details	Island
		None.	

6 Ancillary services

As part of our ongoing system restoration planning, we are undertaking a simulation of our South Island black start contingency plans at the end of February. The exercise will use the Transpower training simulator and will involve both South Island black start providers as well as New Zealand's Aluminium Smelter. The information gained in this simulation will be used for a wider industry exercise planned for later this year.

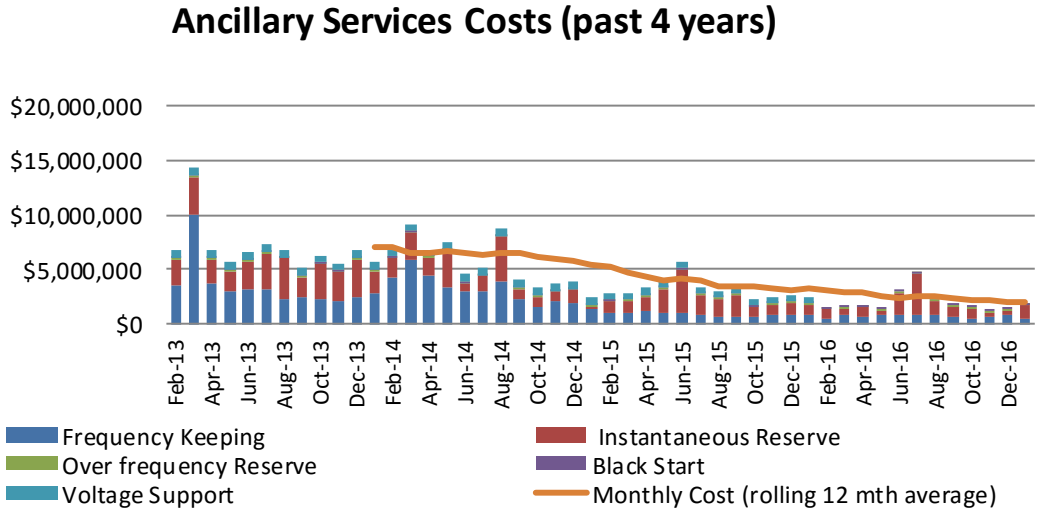
One interruptible load provider had a minor non-compliance in the October 2016 under frequency event. The provider quickly identified and resolved the issue and in December Transpower processed a refund of $7,157.08 reflecting the under delivery.

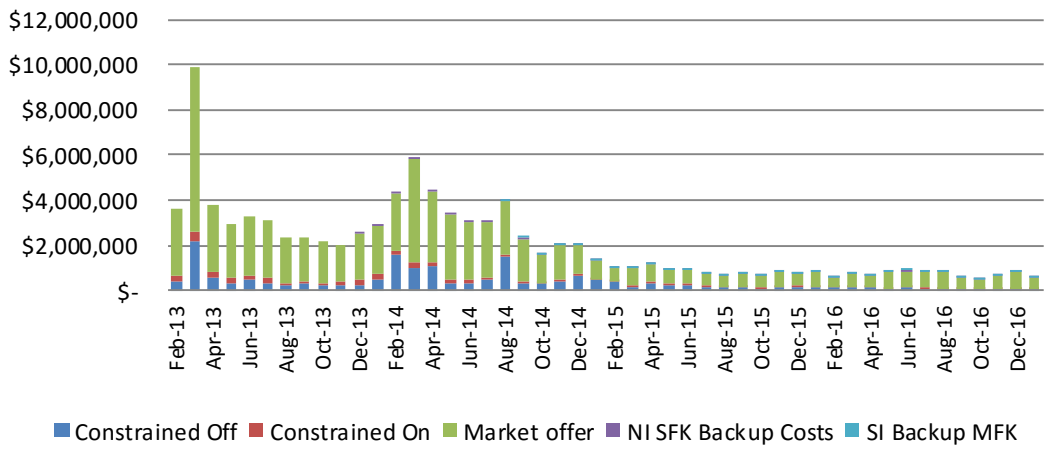
Refer Appendix A for Ancillary Services Graphs.

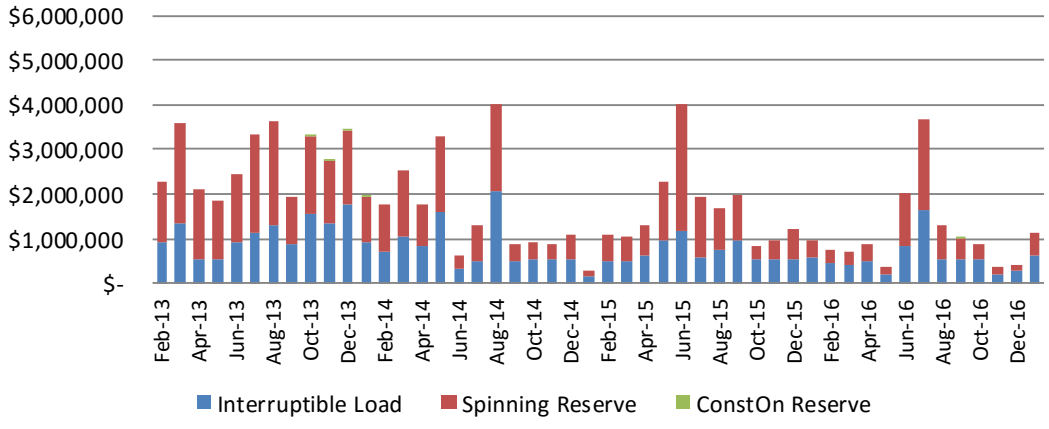
7 Separation of Transpower roles

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

Appendix A: Ancillary Services Graphs







Note: IR Cost May 2012 = 14.129M, IR Cost Jun 2012 = 8.164M

Appendix B: Discretion

Event Date & Time	Subject	Event Description
21/1/2017 2:31:15 PM	DISCRETION	SFD2201 SFD22 Discretion Clause 13.70, Part 13 ENR Max : 0 Start: 21-Jan-2017 14:31 End: 21-Jan-2017 15:00 Notes: SFD22 ramped to zero MW unexpectedly. Unit still connected. Discretion applied to account for loss of generation until SFD can meet station dispatch. Last Dispatched Mw: 68.
25/1/2017 4:58:48 PM	DISCRETION	KPA1101 KPI1 Discretion Clause 13.70, Part 13 ENR Max : 0 Start: 25-Jan-2017 16:58 End: 25-Jan-2017 17:30 Notes: KPI Transformer tripping. Circuit not available. Last Dispatched Mw: 0
31/1/2017 9:15:36 AM	DISCRETION	KAW0113 Discretion Clause 13.70, Part 13 SIR Max : 0 Start: 31-Jan-2017 09:15 End: 31-Jan-2017 09:30 Notes: Last Dispatched: IntF: 29 IntS: 29