MONTHLY SYSTEM OPERATOR AND SYSTEM PERFORMANCE REPORT

FOR THE ELECTRICITY AUTHORITY

Transpower New Zealand Limited

November 2017

Keeping the energy flowing




TRANSPOWER

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Report Purpose

This report is Transpower's review of its performance as system operator for November 2017, 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.

NCCW evacuation

At the early morning of Sunday 12th operation of the building sprinkler system in Waikoukou resulted in evacuation of NCC Wellington following water ingress. Full system management was taken up from NCC Hamilton, with additional resource called to the Hamilton site for the balance of the day and for the evening shift. Wellington co-ordinator resource was provided into Hamilton for two days following the evacuation. While NCC Wellington was out of service, a temporary dispatch facility was established on Waikoukou level 5 and was operational on the 14th. NCC Wellington service resumed on the 20th (pm shift).

Over-Frequency Reserve

Additional over-frequency reserve (OFR) was purchased during the reporting period for the North Island to ensure sufficient reverses to manage over frequency in the island in the event of an HVDC trip. This need was identified from our operational tools. It is expected in the future with the proposed shift to 4 block North Island AUFLS as part of the Efficient Procurement of Extended Reserves project, the need for additional OFR would be reduced. A Customer Advice Notice (CAN) was sent to industry on the 14th of November on this topic.

System operator performance

1 Compliance

One Code breach was reported. This related to the pricing error mentioned last month, concerning acceptance of dispatchable demand bids from WITS into the market system. Several complex circumstances came together at the same time, allowing the error to occur. The breach had a minor market impact.

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

The majority of the project is on hold pending the recommendation on options from the Authority Board, now due in February. In the meantime, Transpower continues to support the Authority with input and options assessment. Transpower continues to work on the capital component of this work, to both make changes to the Reserve Management Tool (RMT) and develop a tool to support extended reserves block data collection. Testing is now complete for this tool change with RMT audit to commence in early December and deployment planned for the end of January.

The approved capital project underway deviates from the current Capex Plan with an increased approved capital cost (approved $525k against Capex Plan of $195k). Although the approved completion date currently aligns with the Capex Plan, this is now at risk given the delays in confirming direction and options.

Real Time Pricing

Support to the Authority for the consultation period for real time pricing continues. Transpower's focus is currently on the issues raised during submissions to understand design implications. The Authority is planning for an early December Board meeting to provide an update and confirm a decision to proceed. Planning commenced for the next phase which will refine the requirements, confirm the solution and develop the capital business case. Time and cost of this work aligns with the current Capex Plan.

Dispatch Service Enhancement (EDF Phase III)

This project will replace the aging inter-party dispatch interfaces. New interfaces will be able to be supported and enable new dispatch products in the future. Solution requirements are complete and now under review. The proof of concept of the design has been completed with high level design progressing well. Preparation for an industry workshop mid-February is under way. 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). An update will be provided in the next quarterly report.

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 Separation 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.

System performance

8 Operational and system events

Loss of supply events

At 02:43 on 8th November there was a simultaneous tripping of the two in-service Upper South Island (USI) 220kV circuits. Shortly thereafter the 66kV/110 kV West Coast network tripped as it could not support the total USI load. Approximately 80MW of load was lost in North Canterbury, Nelson, Marlborough and the West Coast. A grid emergency was declared to reconfigure the grid for restoration using existing contingency plans.

Additional co-ordinator resource was called to NCCW at around 3:30, to assist managing workloads. Final restoration instructions were issued at 05:19. The efficient restoration was aided by the availability of the 220kV circuits, restoration plan and added resource.

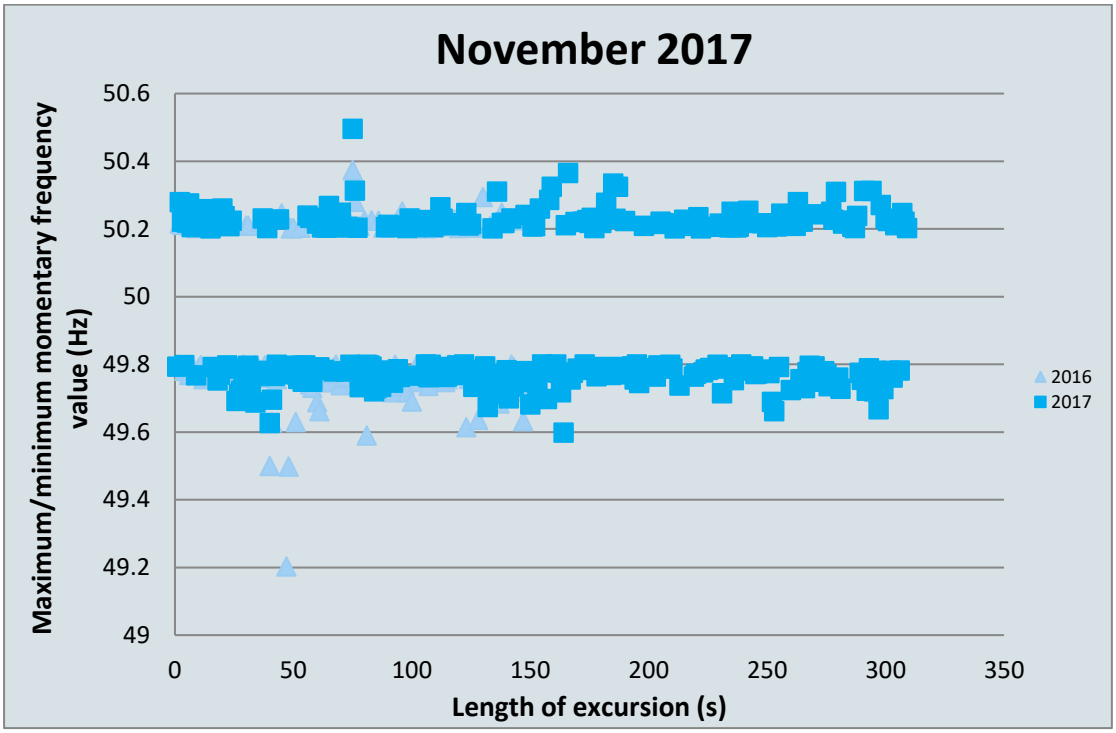
HLY5 outage

The planned two week Huntly U5 outage (ended 18th) saw several evenings where residual generation was low. No actual shortages arose and no warning notices were issued. On U5's return to service a faulty Point of Wave relay at Huntly (Genesis Energy equipment) presented a raised risk of trip concern at reconnection. It was resolved by a collaborative effort across System Operations, Grid Performance, Grid Development and Genesis. A lengthy delay in U5's return to service could have negatively impacted the HVDC outage scheduled in the following week.

9 Frequency fluctuations

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	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Annual rate
55.00 > Freq >= 53.75													
53.75 > Freq >= 52.00													
52.00 > Freq >= 51.25													
51.25 > Freq >= 50.50													
50.50 > Freq >= 50.20	24	22	11	10	8	16	22	6	22	31	41	85	**298**
50.20 > Freq > 49.80													
49.80 >= Freq > 49.50	42	45	30	52	55	59	42	52	92	89	91	135	**784**
49.50 >= Freq > 48.75	1	2		1			3						**7**
48.75 >= Freq > 48.00													
48.00 >= Freq > 47.00													
47.00 >= Freq > 45.00													

South Island

Frequency Band	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Annual rate
55.00 > Freq >= 53.75													
53.75 > Freq >= 52.00				1									**1**
52.00 > Freq >= 51.25													
51.25 > Freq >= 50.50	1	1	1	1	1	1	1		2	1	1		**11**
50.50 > Freq >= 50.20	8	12	9	7	16	18	28	11	17	28	29	47	**230**
50.20 > Freq > 49.80													
49.80 >= Freq > 49.50	17	22	19	27	29	33	45	36	50	58	46	42	**424**
49.50 >= Freq > 48.75							2						**2**
48.75 >= Freq > 48.00				1									**1**
48.00 >= Freq > 47.00				1									**1**
47.00 >= Freq > 45.00													

Note: The frequency excursions for March include simultaneous over-frequencies and under-frequencies that occurred when the South Island was split into two electrical islands on 2 March.

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	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17
Demand Allocation Notice	-	-	-	-	-	-	-	-	-	-	-	-
Grid Emergency Notice	-	-	4	1	1	1	-	-	1	-	-	1
Warning Notice	-	-	-	-	-	-	-	-	-	2	-	-
Customer Advice Notice	7	11	7	24	10	16	23	2	6	6	1	8

12 Grid emergencies

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

Date	Time	Summary Details	Island
08-Nov-17	02:44	A grid emergency was declared to assist with restoration following the tripping of the two 220 kV circuits feeding the top of the South Island and subsequent loss of supply to the Nelson, Marlborough, and Buller regions and part of North Canterbury.	S

13 Security of supply

Like October, November was a dry month. North Island inflows were 103% of average and South Island inflows were 76% of average.

National hydro storage decreased from 101% to 94% of average for the time of year over the month. The hydro risk status remains at ‘Normal’.

14 Ancillary services

New contracts for Ancillary Services have been issued and this includes the two new stations offering instantaneous reserve.

Additional over-frequency reserve has been purchased for the North Island, which would be used to manage frequency in the island in the event of an HVDC trip.

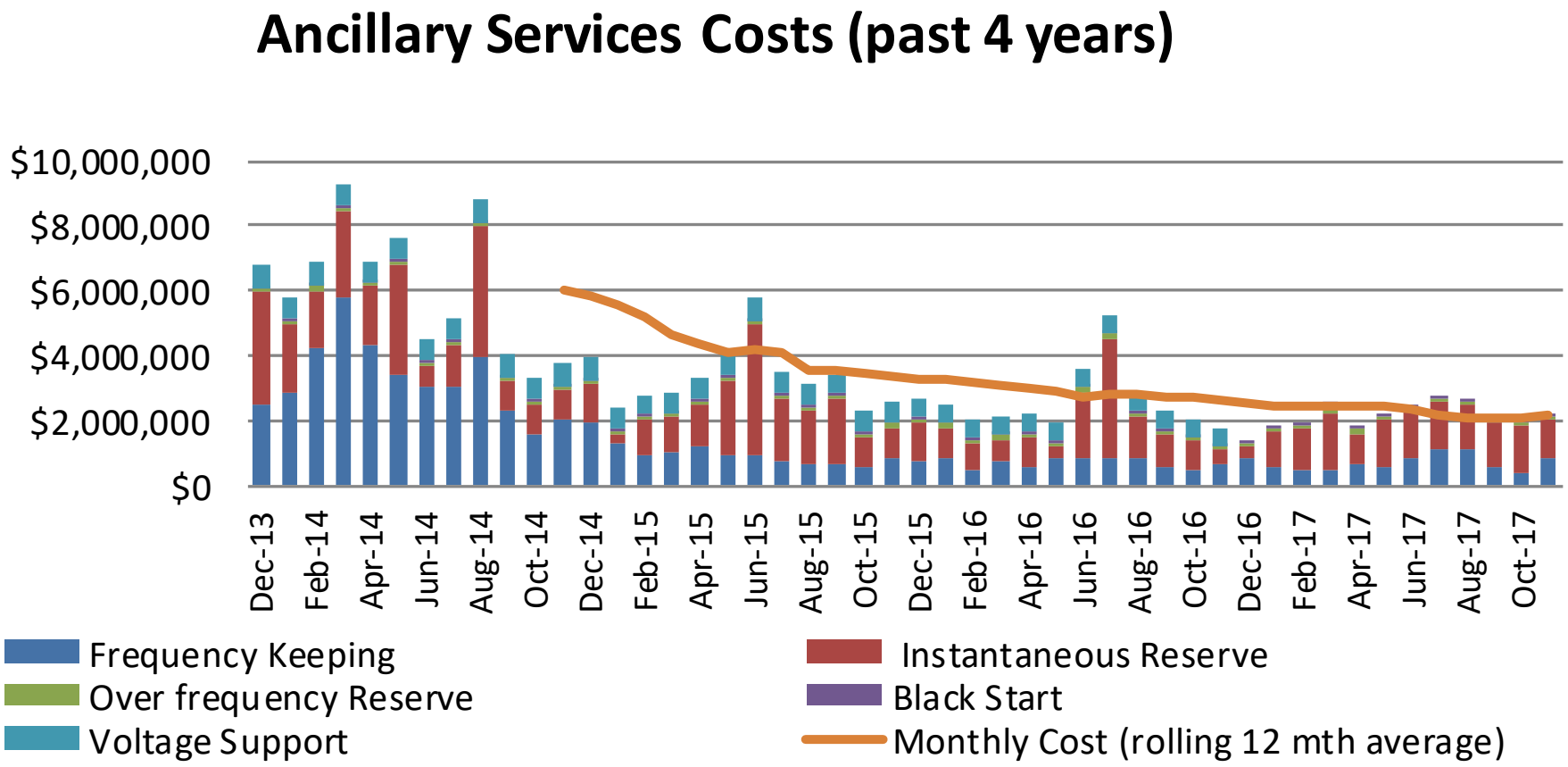
One instantaneous reserve station was briefly suspended from offering reserve until we received confirmation of their reserve response capability. The station was retested and their ability to offer reserves has been reinstated.

Refer Appendix B for Ancillary Services Graphs.

Appendix A: Discretion

Event Date & Time	Event Description
8/11/2017 1:47:09 AM	COL0661 COL0. Clear COL-HOR violations Last Dispatched Mw: 39
8/11/2017 4:14:17 AM	COL0661 COL0. To resolve COL_HOR violations <8 mins. Last Dispatched Mw: 39
8/11/2017 4:43:26 AM	COL0661 COL0. To resolve COL_HOR violations <8 mins. Last Dispatched Mw: 35
9/11/2017 12:00:24 PM	MAN2201 MAN0. Return of Extended Potline 2. Last Dispatched Mw: 555
14/11/2017 12:02:33 PM	MAN2201 MAN0. To provide room for Extended Potline Line 2 restoration now. Last Dispatched Mw: 738
14/11/2017 12:10:14 PM	MAN2201 MAN0. To provide room for Extended Potline Line 2 restoration now. Last Dispatched Mw: 555
14/11/2017 12:13:48 PM	MAN2201 MAN0. To provide room for Extended Potline Line 2 restoration now. Last Dispatched Mw: 625
20/11/2017 1:41:46 PM	MAN2201 MAN0. To allow restoration of TWI potline Last Dispatched Mw: 555
23/11/2017 11:58:09 AM	MAN2201 MAN0. Manage TWI reduction line 2 restoration Last Dispatched Mw: 333
23/11/2017 1:44:34 PM	WRK0331 TAA0. To manage dispatch following WRK T30 tripping.
27/11/2017 2:02:01 PM	MAN2201 MAN0. To allow restoration of TWI potline. Last Dispatched Mw: 444
30/11/2017 12:02:37 PM	MAN2201 MAN0. TWI extended reduction line offload, Line 2 Last Dispatched Mw: 333

Appendix B: Ancillary Services Graphs



Frequency Keeping (past 4 years)