MONTHLY SYSTEM OPERATOR AND SYSTEM PERFORMANCE REPORT

FOR THE ELECTRICITY AUTHORITY

Transpower New Zealand Limited
July 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 July 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.

Te Mauri Hiko (Energy Futures) - We completed our draft technical report for the Energy Storage investigation this month. Some initial insights will be shared by John Clarke at the EV world NZ expo being held in Auckland on 9 August.

Senior Leadership - Sally Holloway has accepted our offer for the Grid and System Operations Manager role. She has a strong background in both internal and customer facing operational technology driven roles with Telecom, Auckland Airport and joins us from Sitel, where she led transformation projects on behalf of a variety of enterprise clients. This means our Senior leadership team is now at full strength.

Conflict of Interest – We have received a draft report from Advisian following their review of our role impartiality policies and procedures. The report is supportive of the current arrangements and has made some recommendations for further improvement. We will be committing additional resource to this in the short term to ensure these recommendations are followed through.

Security of supply - We expect to consult on our review of the Security of Supply Forecasting and Information Policy (SOSFIP) to, potentially, account for contingent storage alongside the Authority's OCC trigger work at the end of this month. We have also received broad industry support for proposed changes to the treatment of thermal fuel limitations in the Hydro Risk Curves. SOSFIP will be sent out for industry consultation in September.

Dry Summer - We published our Lower South Island Dry Summer System Security report, which identifies the limitations within the Southland area and possible actions that could be taken to mitigate the impacts of a dry summer.

Efficient Procurement of Extended Reserves – This project is nearing completion. The draft Technical Requirements Report and proposed changes to Technical Requirements Schedule (TRS) were submitted to the Authority late July. The project is on track to update the documentation for delivery by 15 August.

System operator performance

1 Compliance

We published the report into the events of 2 March 2017 and have accepted five of the twelve breaches alleged by the Authority surrounding these events. One of the accepted breaches is against our principal performance obligations. These allegations are to be discussed at a settlement requirements meeting with industry and the Authority on 15 August. The industry parties joined to this investigation are Meridian Energy, Contact Energy, Transpower as grid owner and the Authority.

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 high value 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 updated Technical Requirements Review Report and proposed changes to the Technical Requirements Schedule was submitted to the Authority for consideration late July 2018. In addition, we submitted a draft Capability Stocktake report and a draft Risk Assessment report. We are working with the Authority to finalise these documents for publication.

Real Time Pricing (RTP)

We received a formal JDP Change notification from the Authority placing the RTP Project on hold, until further funding decisions are made. We continue the review, with the Authority, of any scope items that could be delivered as standalone projects.

Dispatch Service Enhancement

The project is progressing with the detailed design and has commenced the transition process planning initiative in preparation for the first industry engagement workshop planned for October/November. We provided feedback to the Code Change Decision Paper which will be tabled at the Authority August Board Meeting. Communications have been sent out to industry participants.

Cost of this work aligns with the current Capex Plan however the completion is planned one month later than the current Capex Plan date due to delays with the project Approval.

Wind Offer Arrangements

The Wind Offers Arrangements project investigation phase is progressing. The project is intended to improve efficiency and security by altering the way in which wind is offered into the market. This project has been accelerated on the EA's work programme with commissioning planned for August 2019.

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. We are planning to meet with the Authority this month to discuss 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

We confirm that, as required under clause 7.10(4) of the Code, as system operator, Transpower has not been materially affected by any other role or capacity Transpower has under the Code or under any agreement.

We have completed the update to our Conflict of Interest procedures and all system operator staff have completed the online training module. We have received the draft report from our external reviewer looking at our conflict of interest arrangements and our role impartiality and we are providing feedback.

We are reviewing our Outage Planning Policy. We began this work to check that our approach to outage planning enables us to manage any perceived or actual conflicts of interest. As we make progress we can see other benefits:

- the opportunity to align our outage planning approach with our role in assisting the Authority give effect to its CRE objective, and with our approach to the Credible Event Review;
- a consistent and repeatable policy that all stakeholders understand.

The objective of this policy is to allow Transpower (as both system operator and grid owner) and other asset owners to meet their Code obligations related to outage planning in a manner that is consistent, repeatable and assists in giving effect to the Authoirty's statutory objective to promote competition, efficiency and reliability in the electricity industry. We have developed a set of high level principles and are working through how these may be applied to outage planning and if we need to make any changes to existing processes. We will then consult with the Authority and industry on our recommendations.

System performance

8 Operational and system events

The mild weather during the first week of the school holidays (9 July) resulted in relatively low loads, which overnight required significant focus to manage potential high voltage issues. Cold weather later in the second week of the holidays and into the following week resulted in markedly increased loads, pushing up prices (in one instance, a price of $2,000 was reached for a five-minute period) and reducing generation margins to low levels (during peak periods). An industry warning notice notifying a potential lack of offered generation was issued for a period during the morning peak on 25 July.

A short notice, four-hour planned Pole 3 outage on 21 July went well with the equipment brought back into service 1.5 hours early. The work, to complete bushing repairs at Oteranga Bay, was advised to industry only 3 days before the outage took place (normal notice of HVDC outages is not less than 2 weeks). The work was urgent and a result of storm damage which, if left untreated, could have resulted in additional and more significant damage in future bad weather.

On 7 July the Hobson-Wairau Rd cable 1 was taken out of service due to a link box cable sheath joint heating up following water intrusion into the cable duct. The cable was returned to service on the 23 July following testing of the repairs. No impact on customers due to the redundancy afforded by the 220kV network around and through the Auckland CBD.

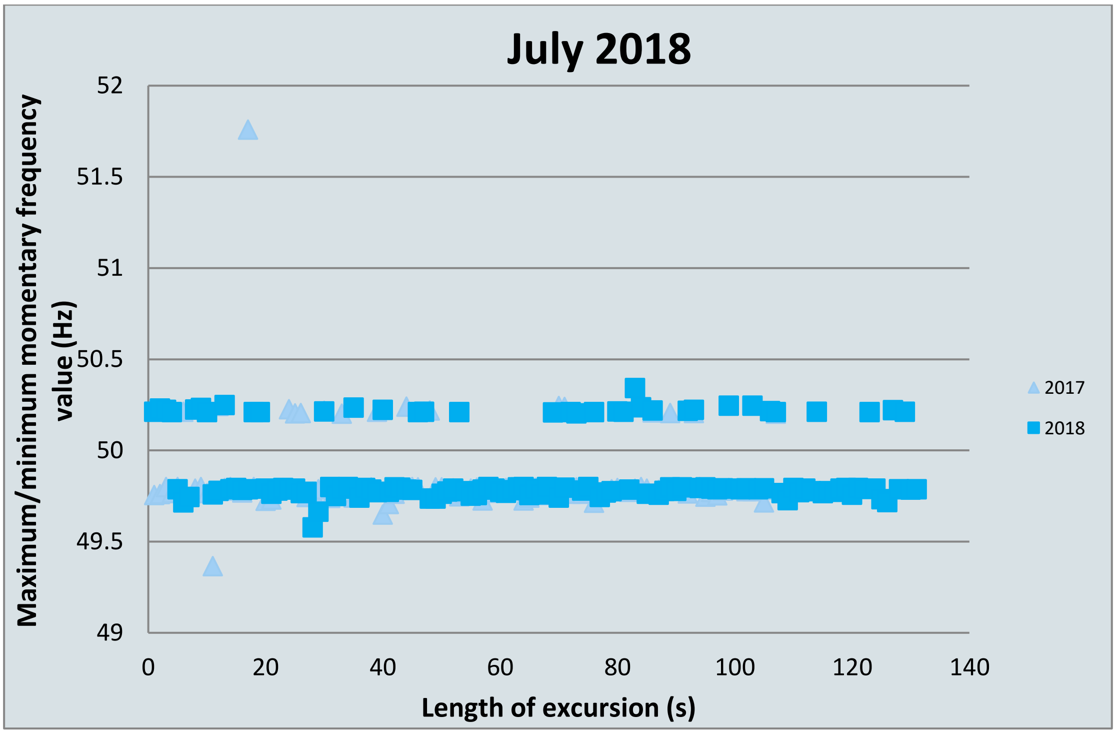
On 2 July NGOC and NCC lost visibility to SCADA from 11:58 to around 12:38, and NCC also lost visibility to the market system during much of that time. Both applications were running but could not be accessed. Market dispatch continued successfully using the Stand-Alone Dispatch application; no asset switching was undertaken. NGOC commenced planning for manual reporting from critical sites, in the event SCADA was unavailable for a prolonged period. Given the time of day and uneventful weather the lack of access caused no immediate operational issues. The loss of access was triggered by a planned IP network change (as part of a firewall migration initiative) that was completed shortly before the incident. This change unintentionally disconnected access to the Southern Data Centre (SDC). The problem was identified promptly, and the issue resolved quickly. Following the event the tools have been reviewed and improvements have been identified by IST.

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	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-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	31	41	85	5	23	19	30	20	30	19	25	**350**
50.20 > Freq > 49.80													
49.80 >= Freq > 49.50	92	89	91	135	27	53	57	62	71	87	65	64	**893**
49.50 >= Freq > 48.75					1		2	1		1	1		**6**
48.75 >= Freq > 48.00													
48.00 >= Freq > 47.00													
47.00 >= Freq > 45.00													

South Island:

Frequency Band	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Annual rate
55.00 > Freq >= 53.75													
53.75 > Freq >= 52.00													
52.00 > Freq >= 51.25													
51.25 > Freq >= 50.50	2	1	1		1			2	1	3			**11**
50.50 > Freq >= 50.20	17	28	29	47	8	13	12	16	14	18	15	10	**227**
50.20 > Freq > 49.80													
49.80 >= Freq > 49.50	50	58	46	42	13	32	24	29	38	49	28	32	**441**
49.50 >= Freq > 48.75					1		2	1			1		**5**
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	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18
Demand Allocation Notice	-	-	-	-	-	-	-	-	-	-	-	-
Grid Emergency Notice	1	-	-	1	-	3	1	-	1	1	-	-
Warning Notice	-	2	-	-	1	-	-	-	-	-	1	1
Customer Advice Notice	6	6	1	8	1	3	6	4	10	12	4	2

12 Grid emergencies

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

Date	Time	Summary Details	Island
		None	

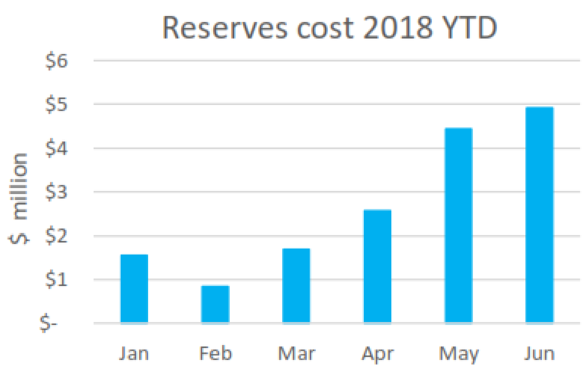
13 Security of supply

During July, North Island inflows were 115% of average and South Island inflows were 168% of average.

National hydro storage increased from 107% to 119% of average for the time of year over the month. The hydro risk status remains at ‘Normal’.

14 Ancillary services

The cost of reserves has increased steadily throughout the year (see chart below – note data is not available for July), with May and June the highest monthly cost of reserves since November 2012. Since demand for reserve has been relatively stable since February, the increase in cost has been driven primarily by an increase in the cost of reserves, particularly Sustained Instantaneous Reserve.



Although we have not spoken to generators about the reasons, our suspicion is that the drivers for the underlying increase in SIR prices are driven by hydrology. The strong hydrology has reduced the amount of reserves being offered from hydro generators as their main aim is to clear water and therefore clear for energy.

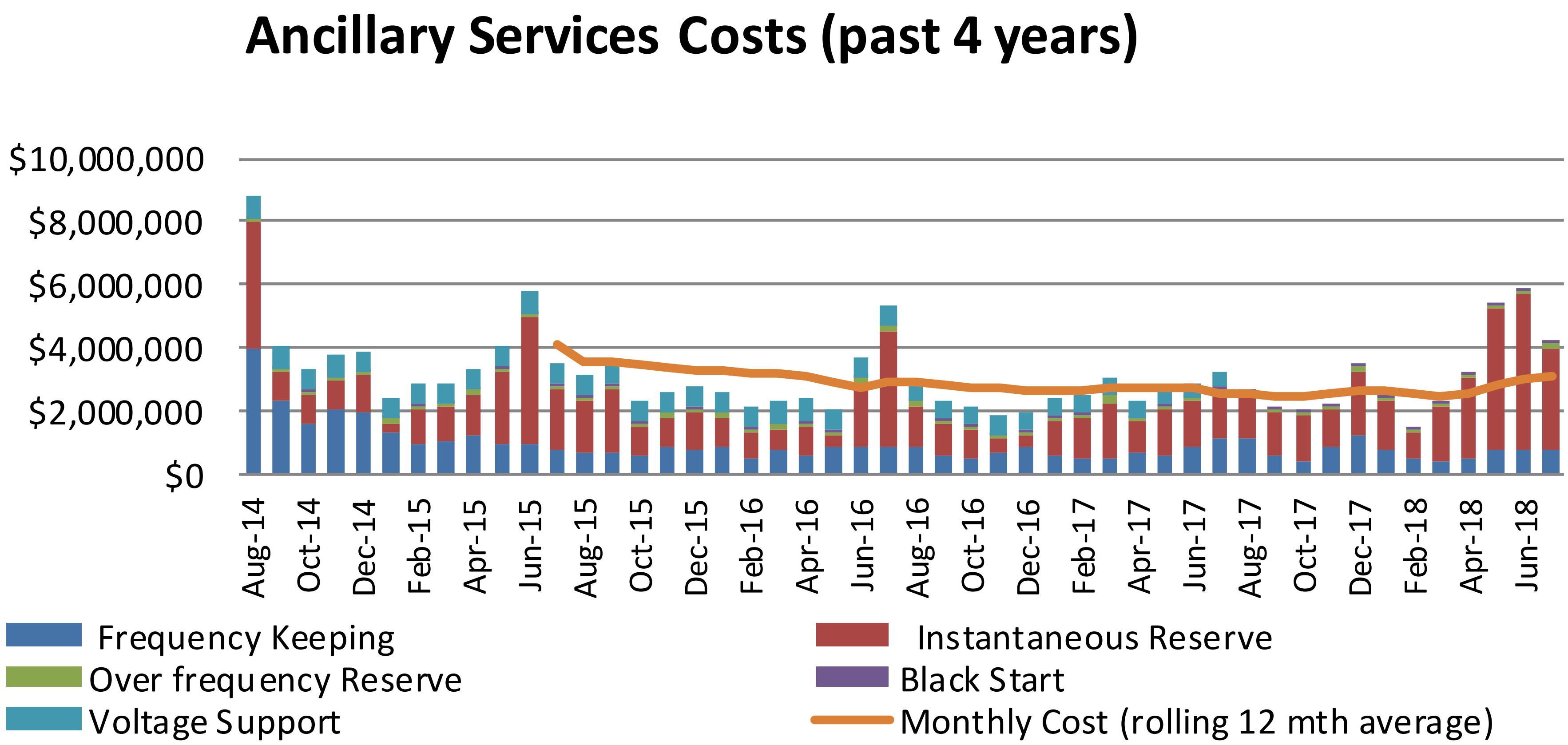
We are working on a number of market design initiatives to help mitigate the high SIR prices.

Refer Appendix B for Ancillary Services Graphs.

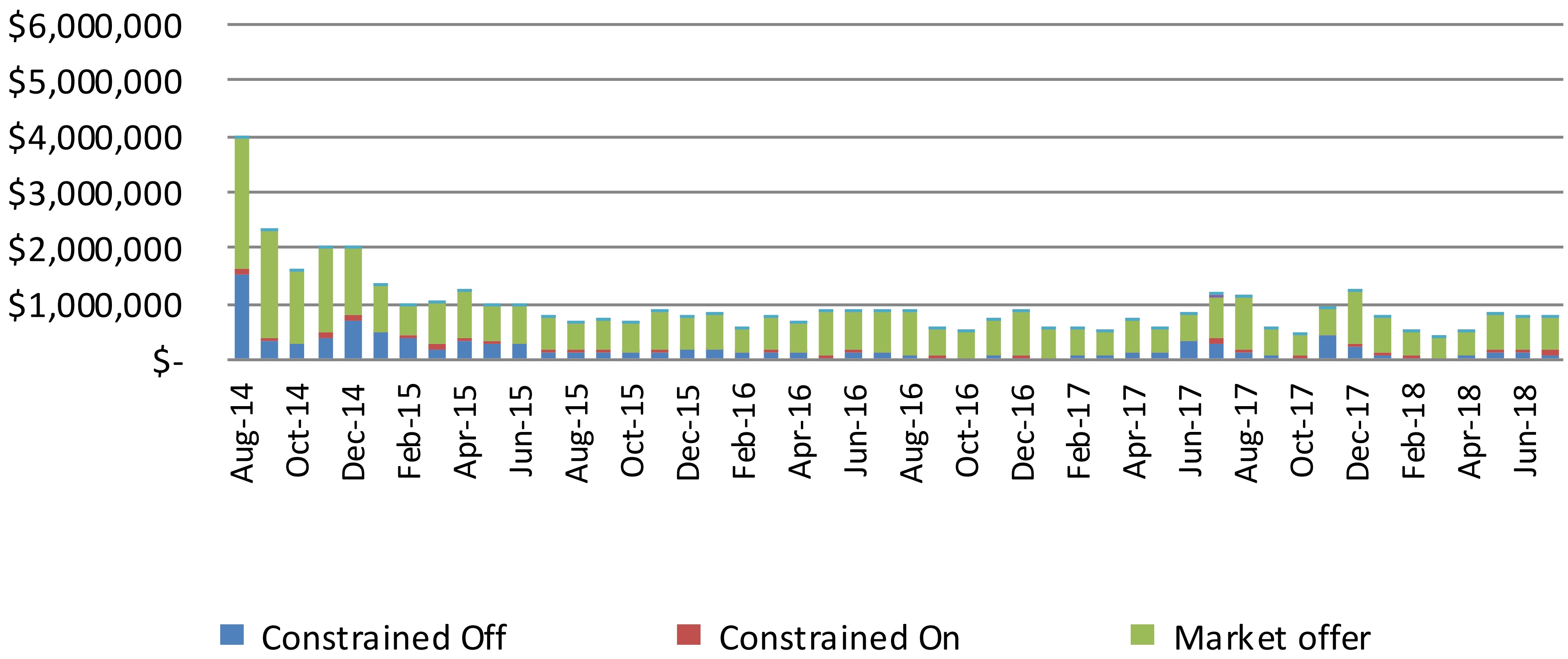
Appendix A: Discretion

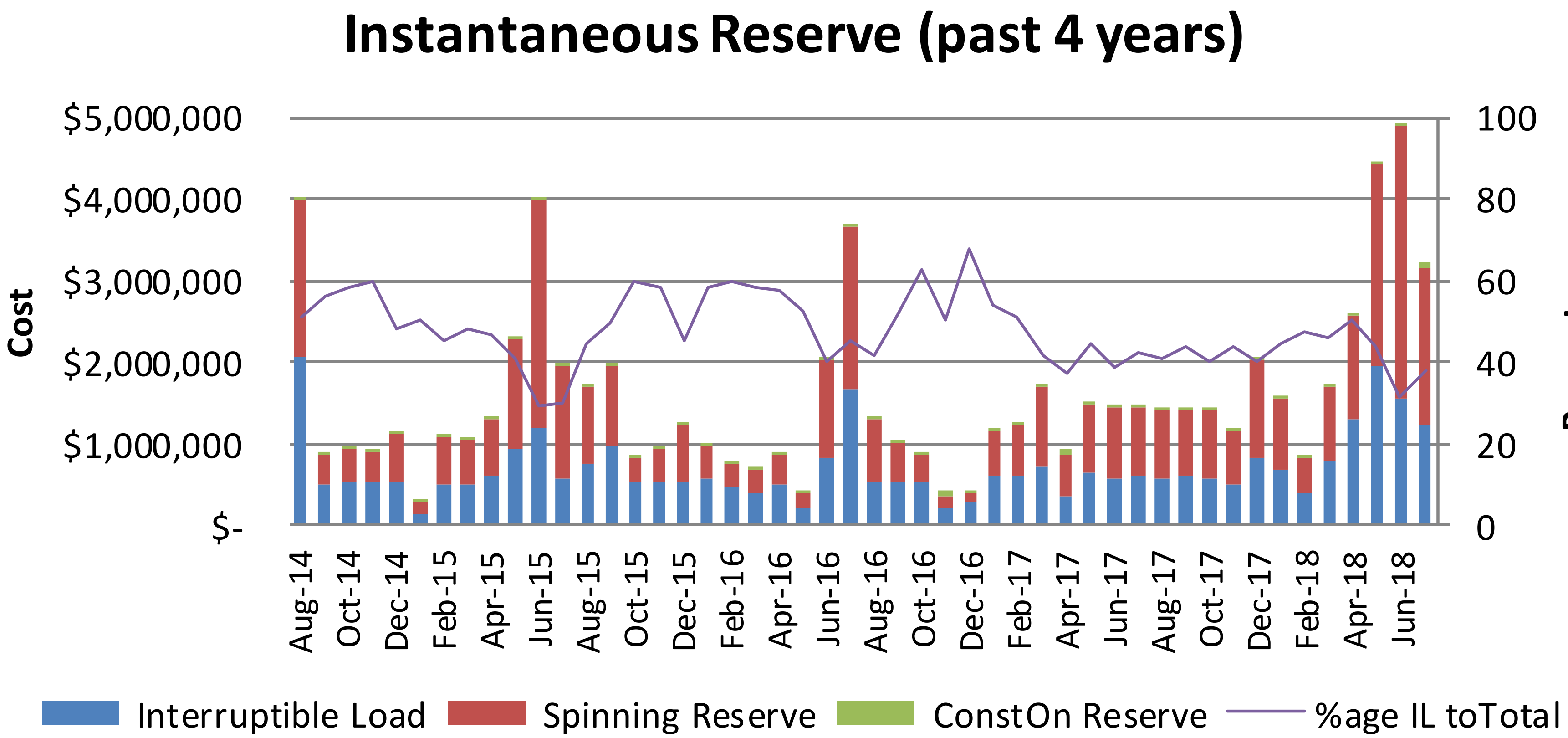
Event Date and Time	Event Description
03-Jul-2018 07:38:48	WHI2201 WHI0 : Required for System Security
03-Jul-2018 07:41:24	WHI2201 WHI0 : Required for System Security
03-Jul-2018 22:03:21	MKE1101 MKE1 : Required for System Security
25-Jul-2018 07:34:14	WHI2201 WHI0 : SRC shortfall AMPK
25-Jul-2018 07:55:33	WHI2201 WHI0 : Required for System Security
30-Jul-2018 12:00:03	MAN2201 MAN0 : Required for extended potline restoration

Appendix B: Ancillary Services Graphs



Frequency Keeping (past 4 years)




Instantaneous Reserve (past 4 years)
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$-
Cost
100
80
60
40
20
0
Percentage
Aug-14
Oct-14
Dec-14
Feb-15
Apr-15
Jun-15
Aug-15
Oct-15
Dec-15
Feb-16
Apr-16
Jun-16
Aug-16
Oct-16
Dec-16
Feb-17
Apr-17
Jun-17
Aug-17
Oct-17
Dec-17
Feb-18
Apr-18
Jun-18
Interruptible Load
Spinning Reserve
ConstOn Reserve
%age IL toTotal