SO QUARTERLY OPERATIONAL AND SYSTEM PERFORMANCE REPORT

FOR THE ELECTRICITY AUTHORITY

Transpower New Zealand Limited
July to September 2016

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 Q1 (July to September) 2016, in accordance with clause 3.14 of the Electricity Industry Participation Code 2010 (the Code).

As this is the final self-review report of the quarter, additional information is included as per SOSPA clause 12.3. This includes performance against the performance metrics in the year to date, and actions taken in regards to the system operator business plan, statutory objective work plan, participant survey responses, and any remedial plan agreed under clause 14.1 (i). A summary of technical advisory services for the quarter is also provided.

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

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Monthly Report – September

1 Operational and system performance update

South Australia experienced a system black event on 28 September. A review of the AEMO interim report is underway to determine any immediate lessons for power system operation in New Zealand.

The System Operator hosted its annual industry workshop. These were held in three locations (Auckland, Wellington and Christchurch) with key topics being the National Market for Instantaneous Reserve and Waikato Upper North Island projects, and the emerging technologies programme of work.

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.

National Market for Instantaneous Reserves – This is a key imitative under the Reserves and Frequency Management Programme. Functional, regression and User Acceptance Testing was completed. Training has commenced with the e-Learning modules released to NCC coordinators and the first workshops completed. Transition planning has been finalised and industry communications preparing for deployment commenced. The project is on schedule for staged deployment starting on 20 October, the originally planned date. The project is tracking to the current Capex Plan with no budget or time variances expected. It is expected to further reduce reserves/ancillary services costs to industry and consumers when in operation. A communications plan is being agreed with the Authority to inform the industry of this key milestone.

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 continued. The initial business case and an associated consultation paper were submitted to the Authority for review and approval at its early October Board meeting. The appropriation process will commence in October/November 2016. Project cost is estimated at $3.96m (including 25% contingency) with the capital phase planned to commence in 2017/18.

Efficient Procurement of Extended Reserves – The Technical Requirements Schedule (TRS) was completed and will be released for consultation on 11 October.

Gate Closure – This project will reduce the gate closure time from 2 hours to 1 hour in the market system. The investigation project continued. The project solution options and development approach went through final review and was approved. Preparation of the business case commenced and is planned for approval by the end of October. Delivery is expected on 30 June 2017.

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Real Time Pricing – Work continues on the development of the market and systems changes associated with Real Time Pricing (RTP). An independent complexity assessment has been carried out which demonstrated the high complexity of this work. Following this a risk workshop will be held. Decisions and assumptions workshops are underway and the initial code review has started. Stakeholder requirements workshops are scheduled for November.

3 Security of Supply update

High North Island inflows continued in September. South Island inflows dropped below average and South Island storage levels also declined, although the current storage level continues to remain well above average. The hydro risk meter remained at normal.

- on 1 October 2016, aggregate primary New Zealand storage was 111% of average
- North Island inflows were 114% of average
- South Island inflows were 78% of average
- measurements are based on daily inflow values.
- hydro generation met 65% of demand.

4 Compliance update

The system operator self-reported two breaches of the Code.

In the first event Woodville T2 was incorrectly modelled as out-of-service following a tripping of a Woodville-Dannevirke-Waipawa circuit. The transformer was mistaken for Waipawa T2 due in part to the similar appearance of the three-letter acronyms used (WDV compared with WPW). The incorrect modelling persisted for just over one hour, with negligible market or operational impact.

In the second event a pair of non-response/price-responsive long schedules (NRLS/PRSL) failed to complete before the end of the following trading period. Planned market system maintenance overran by a few minutes and impacted schedule solves. The error was unexpected as similar maintenance throughout the day had failed to result in errors. In response, critical services analysts have updated the process to track error notifications in the market system during this maintenance.

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

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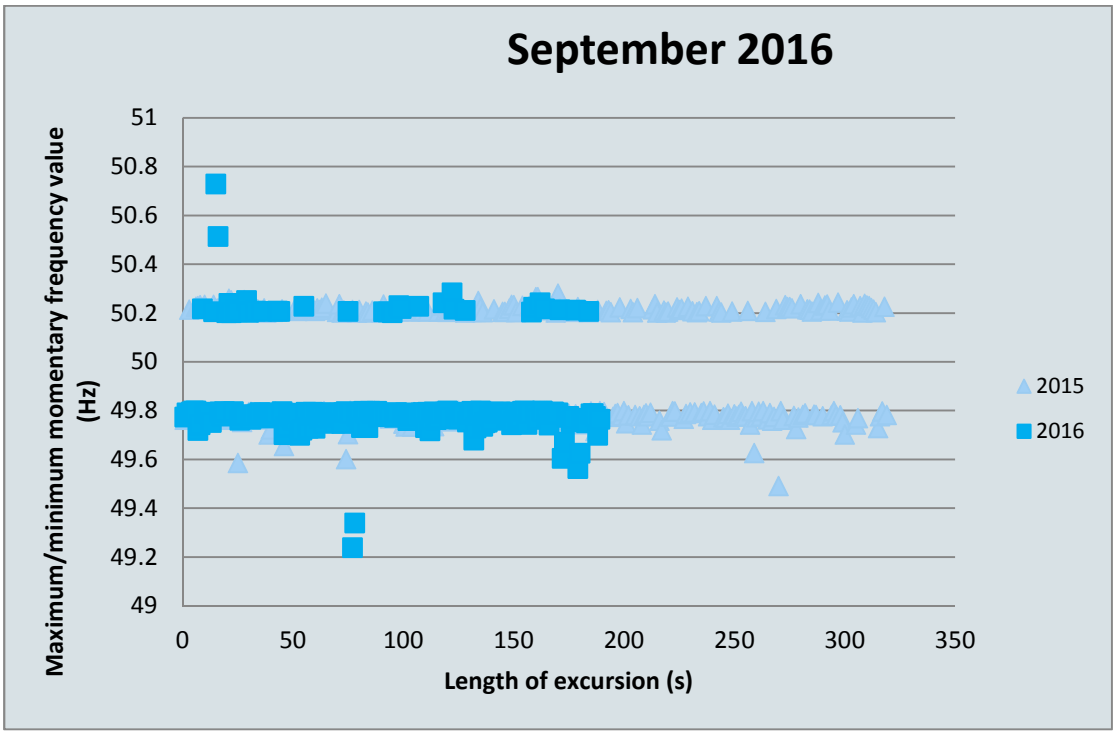
5 Operational management

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). The majority of excursions are within 0.4 Hz of the normal band and frequency typically returns to within the normal band within two minutes.



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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	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	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	1	3		1	3						2	**11**	**50**
50.50 > Freq >= 50.20	52	52	37	10	18	31	30	42	29	25	13	32	**371**	
50.20 > Freq > 49.80														
49.80 >= Freq > 49.50	128	173	111	84	101	118	125	106	89	128	102	153	**1418**	
49.50 >= Freq > 48.75			1	1		1		2		1		2	**8**	**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.

5.2 Voltage management

Grid voltages did not exceed the Code voltage ranges.

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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	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
Demand Allocation Notice	-	-	-	-	-	-	-	-	-	-	-	-
Grid Emergency Notice	1	2	1	4	2	2	2	5	2	3	2	1
Warning Notice	3	-	-	-	-	-	-	3	2	2	5	1
Customer Advice Notice	7	9	16	3	7	19	11	12	3	8	7	5

5.4 Grid emergencies

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

Date	Time	Summary Details	Island
28/09/16	15:01	A grid emergency was declared to close the 110 kV Arapuni Bus split due to lightning in the vicinity.	N

6 Ancillary services

Our tender for over-frequency reserve commenced on 30 September. There may be additional competition for this service as an enquiry from a potential new provider was received. Existing ancillary service contracts for instantaneous reserve and frequency keeping were rolled over until next year – this is a new initiative intended to increase procurement process efficiency and has been welcomed by participants.

Refer Appendix A for 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.

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Quarterly Report – Q1 (July to September)

1 Performance metrics

The following table shows system operator performance against the performance metrics for the financial year during Q1 as required by SOSPA 12.3 (a).

Performance Metric	Q1 Progress
Released at least $1 million of market benefits through the application of the CRE objective and/or implementing new capital investments:	• working group has been formed to establish a measurement methodology • process for identifying initiatives and planning to determine measurement and assessing market benefit is underway.
77.5% of the participants responding to the annual participant survey rate the system operator's performance as 'good' or better:	• participant survey initiated at Industry Workshop 1 (27-29 September) • 51 responses from attending participants with the survey to be made available online in October.

2 Actions taken

The following table contains a full list of actions taken during Q1 in regard to the system operator business plan, statutory objective work plan, participant survey responses, and any remedial plan, as required by SOSPA 12.3 (b).

Item of interest	Actions taken
(i) To give effect to the **system operator business plan**:	• planning in place to start first business assurance audit before end October • identified additional actions for engagement action plans following the last engagement survey • system operator industry workshop 1 was delivered on 27-29 September (one day each Auckland, Wellington, Christchurch) • participant survey on system operator performance was initiated during industry workshop 1 and is ongoing • commenced identifying and recording trends to predict and reduce overall number of events • delivered draft Capex Plan and draft Capex Roadmap • implemented SO-IST operating model • issued Annual Review of system operator service.
(ii) To comply with the **statutory objective work plan**:	**Policy and procedure alignment with CRE** Ongoing checks being undertaken for CRE as part of document review process.

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	Review of Contingent Storage under SOSFIP Scoping commenced. **Review of the Security Policy – Busbars** Finalisation of the classification methodology continued. Initial assessments of some key busbars were completed. Once methodology is finalised remaining assessments will be undertaken. Presentations of the methodology with key stakeholders commenced. **Develop a suite of performance metrics** Peer research commenced. An approach and framework was established and a working group formed.
(iii) In response to participant responses to any **participant survey**:	N/A – Initial participant survey responses were received; survey will close in October.
(iv) To comply with any **remedial plan** agreed by the parties under SOSPA 14.1 (i):	N/A – No remedial plan in place.

3 Cost-of-services reporting

The feasibility study into implementing annual cost-of-services reporting to the Authority is not required until financial year 2 (SOSPA 12.6 refers). Planning will commence in October.

4 Technical advisory hours and services

The following table provides the technical advisory hours for Q1 and a summary of technical advisory services to which those hours related (SOSPA 12.3 (d) refers).

TAS Statement of Work (SOW)	Status	Hours worked during Q1
TAS SOW 55 – MFK Refinement.	Closed	7
TAS SOW 58 – Governor Response Metric.	In Progress	223
TAS SOW 59 – IR Market Review.	Closed	0
TAS SOW 60 – Real Time Pricing.	In Progress	354.25
TAS SOW 61 – Review of Wholesale Market Trading. Arrangements	In Progress	10
Total hours		**594.25**

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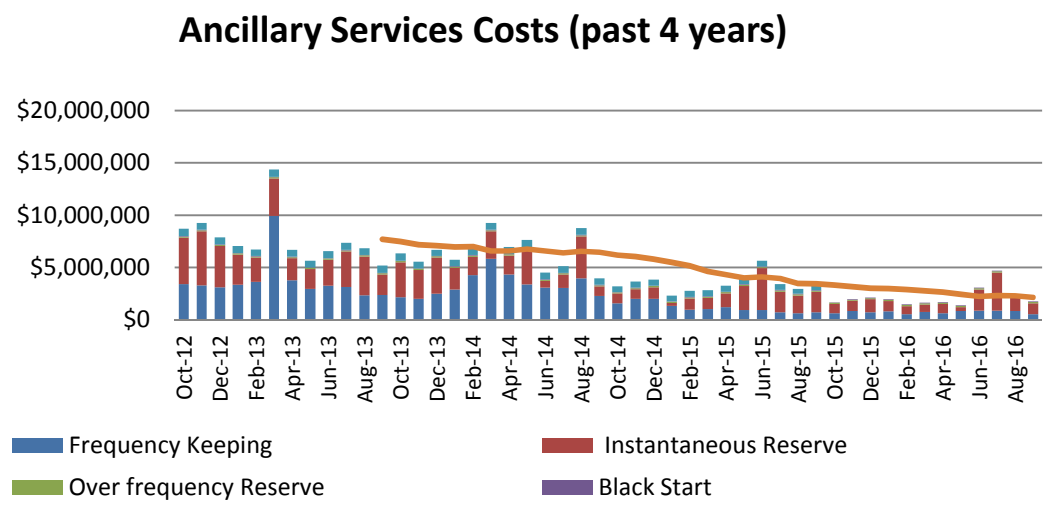
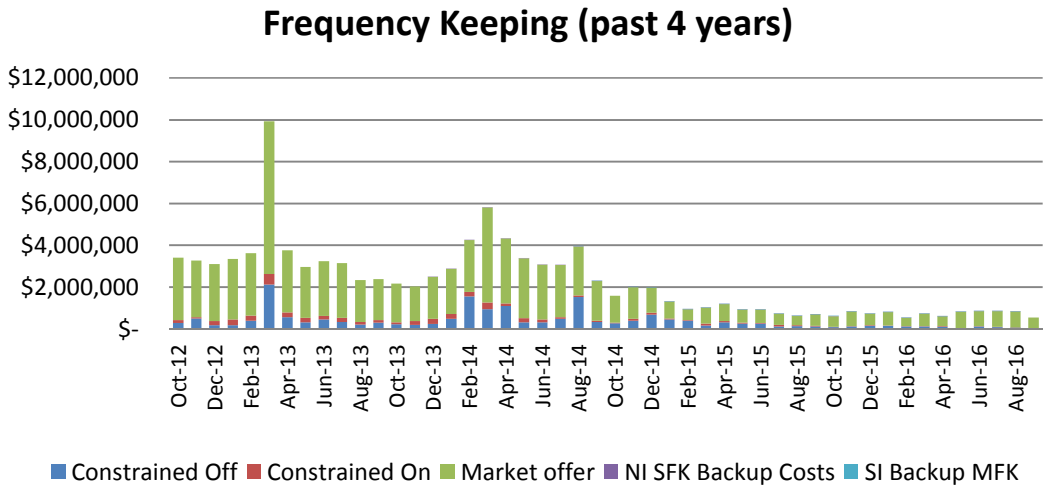
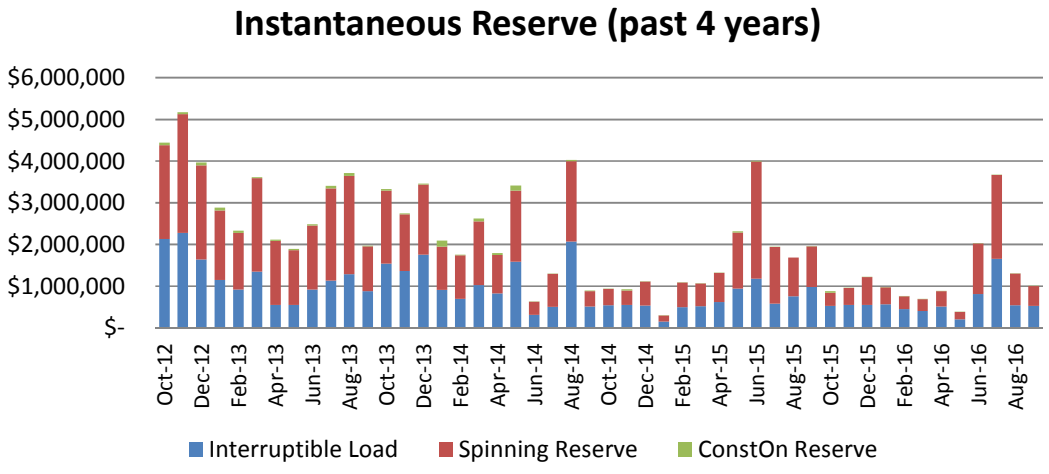
Appendix A: Ancillary Services Graphs







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

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Appendix B: Discretion

Event Date & Time	Subject	Event Description
6/9/2016 9:11:35 AM	DISCRETION	MAN2201 MAN0 Discretion Clause 13.70, Part 13 EN Max : 553 Start: 06-Sep-2016 09:11 End: 06-Sep-2016 09:30 Notes: Restoration of an extended potline Last Dispatched Mw: 738
8/9/2016 6:30:03 PM	DISCRETION	WHI2201 WHI0 Discretion Clause 13.70, Part 13 EN Min : 10 Start: 08-Sep-2016 18:30 End: 08-Sep-2016 19:00 Notes: Required for security of supply over the evening peak. Last Dispatched Mw: 18.38
8/9/2016 6:56:06 PM	DISCRETION	WHI2201 WHI0 Discretion Clause 13.70, Part 13 EN Min : 10 Start: 08-Sep-2016 18:56 End: 08-Sep-2016 19:30 Notes: Required for security of supply over the evening peak.Over 100MW of industrial load came off for the peak and may come back in a short period of time. Last Dispatched Mw: 10
8/9/2016 7:30:09 PM	DISCRETION	WHI2201 WHI0 Discretion Clause 13.70, Part 13 EN Min : 10 Start: 08-Sep-2016 19:30 End: 08-Sep-2016 20:00 Notes: Required for security of supply over the evening peak.Over 100MW of industrial load came off for the peak and may come back in a short period of time. Last Dispatched Mw: 10
8/9/2016 8:00:02 PM	DISCRETION	WHI2201 WHI0 Discretion Clause 13.70, Part 13 EN Min : 10 Start: 08-Sep-2016 20:00 End: 08-Sep-2016 20:30 Notes: Required for security of supply over the evening peak.Over 100MW of industrial load came off for the peak and may come back in a short period of time. Last Dispatched Mw: 10
8/9/2016 8:34:50 PM	DISCRETION	MKE1101 MKE1 Discretion Clause 13.70, Part 13 EN Min : 30 Start: 08-Sep-2016 20:34 End: 08-Sep-2016 21:00 Notes: Required for security of supply over the evening peak.Over 100MW of industrial load came off for the peak and may come back in a short period of time. Last Dispatched Mw: 15.33
9/9/2016 7:58:29 AM	DISCRETION	WHI2201 WHI0 Discretion Clause 13.70, Part 13 ENR Min : 10 Start: 09-Sep-2016 07:58 End: 09-Sep-2016 08:30 Notes: Last Dispatched Mw: 25
12/9/2016 9:36:55 AM	DISCRETION	MAN2201 MAN0 Discretion Clause 13.70, Part 13 EN Max : 481 Start: 12-Sep-2016 09:36 End: 12-Sep-2016 10:00 Notes: Extended Potline 2. Last Dispatched Mw: 666
12/9/2016 6:45:17 PM	DISCRETION	WHI2201 WHI0 Discretion Clause 13.70, Part 13 EN Min : 10 Start: 12-Sep-2016 18:45 End: 12-Sep-2016 19:00 Notes: Required for security, low residual Last Dispatched Mw: 25
12/9/2016 6:56:45 PM	DISCRETION	WHI2201 WHI0 Discretion Clause 13.70, Part 13 EN Min : 10 Start: 12-Sep-2016 18:56 End: 12-Sep-2016 19:30 Notes: Required for security over peak. Last Dispatched Mw: 10
15/9/2016 6:34:54 PM	DISCRETION	WHI2201 WHI0 Discretion Clause 13.70, Part 13 EN Min : 10 Start: 15-Sep-2016 18:34 End: 15-Sep-2016 19:00 Notes: To ensure certainty of supply over the evening peak for system security. Last Dispatched Mw: 25
16/9/2016 12:54:46 PM	DISCRETION	KAW0112 ONU0 Discretion Clause 13.70, Part 13 ENR Max : 40 Start: 16-Sep-2016 12:54 End: 16-Sep-2016 13:30 Notes: Last Dispatched Mw: 48.9
26/9/2016 10:35:49 AM	DISCRETION	MAN2201 MAN0 Discretion Clause 13.70, Part 13 EN Max : 480 Start: 26-Sep-2016 10:35 End: 26-Sep-2016 11:00 Notes: Return of a prolonged Potline. Line 2. 187MW. Last Dispatched Mw: 666
28/9/2016 4:26:39 PM	DISCRETION	RPO2201 RPO0 Discretion Clause 13.70, Part 13 EN Max : 0 Start: 28-Sep-2016 16:30 End: 28-Sep-2016 17:00 Notes: Last Dispatched Mw: 0. 220kV bus unavailable for security reasons.

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28/9/2016 6:46:04 PM	DISCRETION	KAW1101 KAG0 Discretion Clause 13.70, Part 13 ENR Min : 70 Start: 28-Sep-2016 20:00 End: 28-Sep-2016 21:00 Notes: Last Dispatched Mw: 104
28/9/2016 7:39:04 PM	DISCRETION	KAW1101 KAG0 Discretion Clause 13.70, Part 13 EN Max : 95 Start: 28-Sep-2016 19:39 End: 28-Sep-2016 19:42 Notes: Last Dispatched Mw: 104. Discretioned down to be at 70 MW by 20:00, to avoid instant violations on KAW T123 & T13.
28/9/2016 7:43:01 PM	DISCRETION	KAW1101 KAG0 Discretion Clause 13.70, Part 13 EN Max : 90 Start: 28-Sep-2016 19:43 End: 28-Sep-2016 19:47 Notes: Discretioned down to be at 70 MW by 20:00, to avoid instant violations on KAW T123 & T13. Last Dispatched Mw: 95.52
28/9/2016 7:47:29 PM	DISCRETION	KAW1101 KAG0 Discretion Clause 13.70, Part 13 EN Max : 70 Start: 28-Sep-2016 19:47 End: 28-Sep-2016 20:00 Notes: Discretioned down to be at 70 MW by 20:00, to avoid instant violations on KAW T123 & T13. Last Dispatched Mw: 92.86

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