

Shortage Pricing ORDC - Order 825

Lisa Morelli

Manager, Real-Time Market Operations

Market Implementation Committee

December 14, 2016

	Date	Committee	Agenda
✓	Jul. 28, 2016	MRC	Problem Statement/Issue Charge approval
✓	Aug. 10	MIC	Education
✓	Oct. 5	MIC	Education, Interest, Options
✓	Oct. 26	MIC	Education, Interest, Options
✓	Nov. 2	MIC	Interest, Options, Packages
✓	Dec. 14	MIC	Interest, Options, Packages / <u>1st Read on Package(s)</u>
	Dec. 22	MRC	Provide update on progress
	Jan. 11, 2017	MIC	Vote on Package(s)
	Jan. 26	MRC/MC	1 st Read on Manual/Tariff changes at <u>both</u> MRC and MC
	Feb. 23	MRC/MC	Vote Manual/Tariff changes at <u>both</u> MRC and MC
	Mar. 1	---	Submit 205 filing at FERC

PJM will seek a simultaneous implementation date of February 1, 2018 for both Settlements and Shortage. If FERC grants this request, the above timeline may be relaxed.

PJM is recommending the following changes to the Operating Reserve Demand Curve (ORDC):

	Current		Proposed	
	Penalty Factor	MW	Penalty Factor	MW
Step 1	\$850	Economic Maximum of the single largest contingency	\$850 (No change)	Actual output of the single largest contingency (changes dynamically in real-time)
Step 2 (Permanent)	N/A	N/A	\$300	Step 1 MW + 190 MW 190 MW = (MAD Synch Reserve Deficit Mean + 1 Standard Deviation)
Step 2 (Extended)	\$300	Step 1 MW + Additional Reserve MW	\$300 (No change)	Step 2 MW + Additional Reserve MW

There are two different ways that Reserves can be extended under existing business rules:

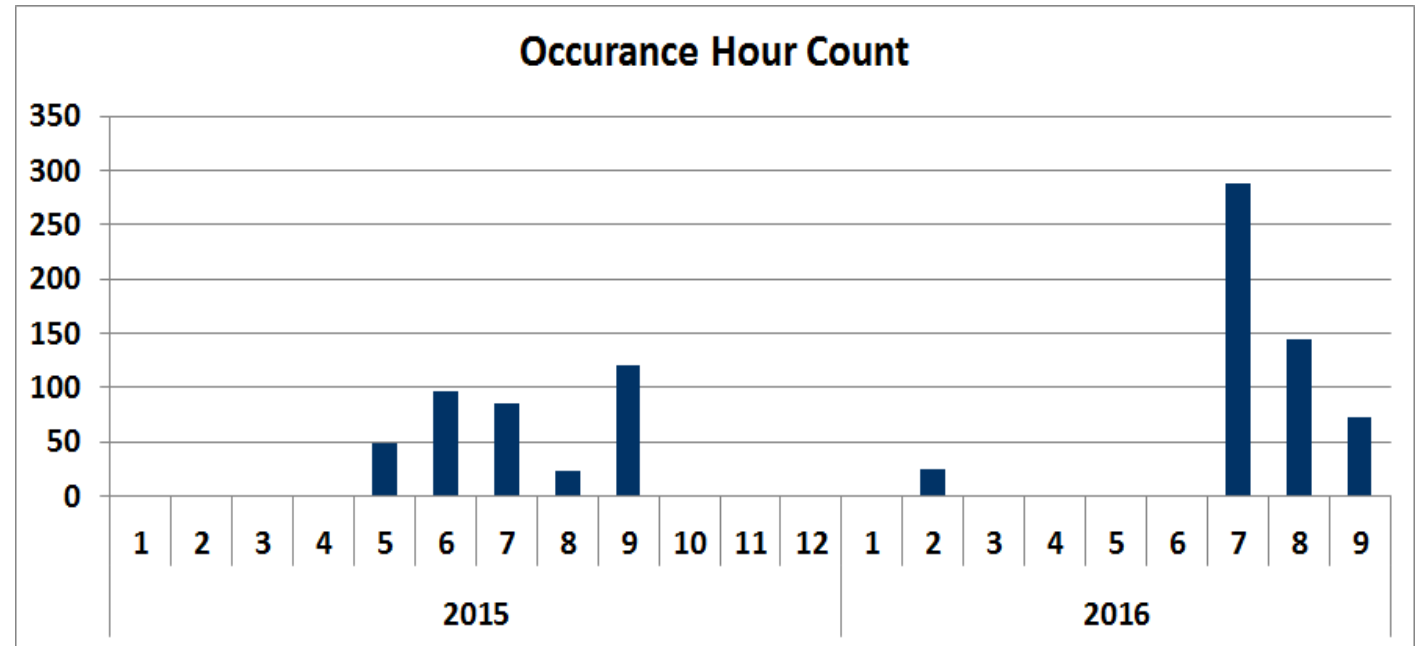
1) Day-Ahead

- The Day-Ahead Scheduling Reserve (DASR) requirement will be extended following the issuance of a Hot / Cold Weather Alert in PJM. The exact formula is in Manual 11, Section 11. This extension applies when the alerts are issued prior to the close of the Day-Ahead Market.

2) Real-Time

- The Reserve requirements will be extended following the issuance of a Hot / Cold Weather Alert in PJM and PJM brought additional resources online after the Reliability Assurance Commitment occurs.

- PJM has not extended the Real-Time reserves
- PJM has increased the DASR requirement for 901 hours between January 1, 2015 and September 30, 2016
- 901 hours represent 5.88% of the total hours
- On average, PJM increased the requirement by 5,000 MW



- Absent a change to the demand curve, the change to start pricing transient shortages will result in \$850/MWh reserve prices during minimal / transient shortages
 - This pricing could overstate the severity of system conditions
 - Will likely result in operational volatility if participants respond heavily to these transient events
- Adding a smaller step to the demand curve will:
 - Better reflect the lower reliability concern of small reserve deficiencies
 - Create better price signals prior to when synchronized reserves are less than the largest contingency
 - Resources and interchange will be incentivized earlier, potentially avoiding a larger reserve shortage at the \$850/MWh level

Three different reasons for changes to Manual 11

- 1) Order 825 Compliance allowing transient shortages (**blue** highlight in M11 redline)
 - a) Based on language to be filed on January 11, 2017
 - b) Proposed February 1, 2018 effective date

- 2) 205 Filing to include a permanent second demand curve step (**green** highlight in M11 redline)
 - a) Based on current PJM's proposal
 - b) Proposed February 1, 2018 effective date

- 3) Changes conforming with M13 (**yellow** highlight in M11 redline)
 - a) Will become effective upon endorsement of manual changes

The following changes were made to achieve compliance with FERC Order 825's directive to allow transient shortages

- Section 2.3.2 and 2.3.3 - added clarifying language to which step in the demand curve is used
- Section 2.5 – removed wording describing the demand curve and penalties and reworded in Section 4.2
- Section 2.9 - removed IT SCED from determining shortage
- Section 4.2.2, 4.2.2.1, 4.2.9 and 4b.2.2 – incorporated language from Section 2.5 and clarified how the demand curves, penalties and requirements are structured
 - Section 4.2.2.1 outlining the shape of the demand curve is new
- Other ministerial changes to address capitalization

The following change was made to implement the PJM proposal to add a permanent second step on the demand curve

- Section 4.2.2.1 – Within the newly created section, three words were added to Step 2
 - *Step 2*
 - *Penalty Factor = \$300/MWh*
 - *Desired Reserve MW = locational reserve requirement for the specified reserve product as defined in M13 plus 190 MW plus any additional reserves that are being carried in anticipation of heavy load conditions, as referenced in Section 4.2.2 above.*

Section 4.2.2

- Clarified wording describing additional reserves carried during outage conditions that cause the largest single contingency to become a loss of more than one generator (historically referred to as a ‘double spin’ event)
- Removed on-peak/off-peak differentiation during such conditions to conform with operational change

Section 4b.2.3

- Corrected NSR MW equation to add missing floor at 0 MW (ministerial change)



Stakeholder and FERC Timing

*PJM will request simultaneous implementation of Shortage and Settlements on February 1, 2018.

Date	FERC	Stakeholder
Jan. 11, 2017	Compliance Filing (Transient Shortages / 5 min settlements)*	Vote demand curve changes at MIC
Jan. 26	---	1 st Read at MRC (demand curve changes and OATT language for compliance filing)
Feb. 15	Requested response on implementation from FERC	---
Feb. 23	---	Vote at MRC & MC
Mar. 1	205 Filing on Demand Curve	---
May 11	---	Implementation date specified in Order 825
Feb. 1, 2018	---	Implementation date requested in Compliance Filing

Potential Scenarios

#1 – FERC does not respond by Feb. 15, 2017 to implementation request.

Proceed with a vote at the February MRC and MC and submit a Section 205 filing for the approved changes around March 1. This filing will request an implementation date coincident with Order 825 Shortage changes (which could be May 11, 2017 or Feb 1, 2018).

#2 – FERC responds by Feb. 15, 2017 to implementation request and denies.

Remain on the expedited path seeking a vote at both the MRC and MC in February with a 205 filing around March 1. This filing will request the changes to the demand curve but with a May 11, 2017 implementation date.

#3 – FERC responds by Feb. 15, 2017 to implementation request and approves.

Relax the timeline and only seek a vote at the MRC in February. Then seek at vote at the MC on March 23, with a subsequent 205 filing at FERC in April.

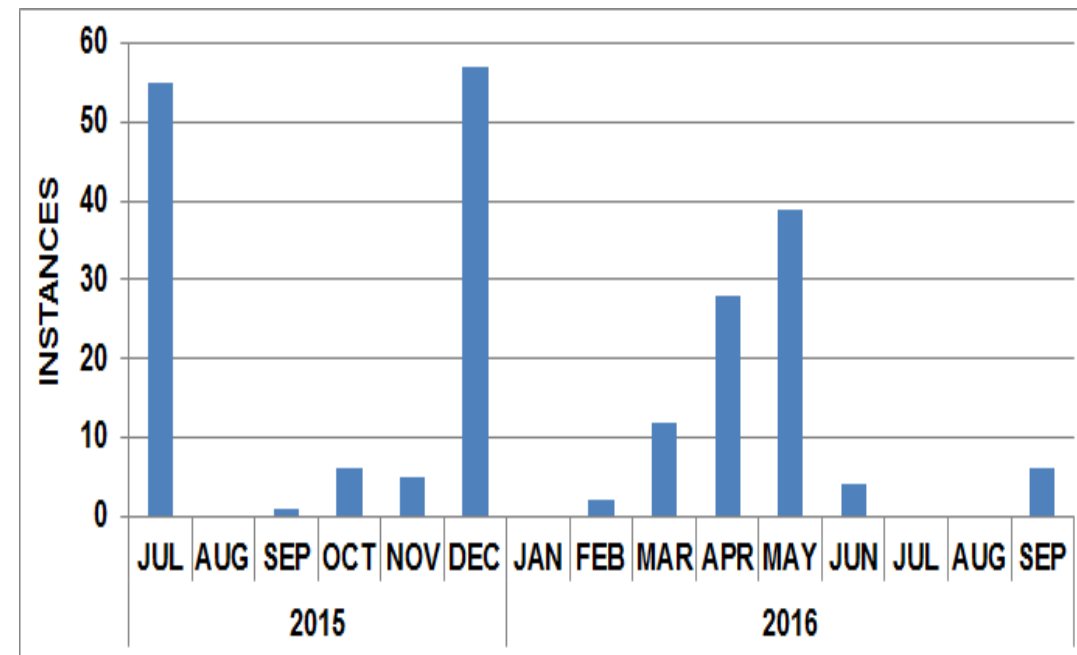
Appendix

MAD Synch MW Deficits Without Pricing the Shortage

- From July 1, 2015 through September 30, 2016
- 215 instances where the \$850/MWh penalty factor would have been included in the calculations of LMPs and reserve clearing prices
 - 2015: 124 instances (0.234% of total Jul-Dec 2015 instances)
 - 2016: 91 instances (0.115% of total Jan-Sep 2016 instances)

Shortage MW

Year	Mean	Median	Min	Max	Standard Deviation
2015	102	85	0	380	83
2016	92	61	3	463	102
Combined	98	73	0	463	92



PJM Proposed Recommendation - Graph

