Market Seller Offer Cap Balancing Ratio Proposal

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Background

- PJM raised the issue regarding the Balancing Ratio (*B*) used in the default Market Seller Offer Cap (*MSOC*) for RPM auctions in September, 2017
  - *Default MSOC = Net CONE$_{LDA}$ * B*
  - Current tariff rules to calculate *B* rely on having Performance Assessment Intervals (PAIs) occur during the three calendar years that immediately precede the BRA, and becomes indeterminable when that does not occur
- Review of the assumed number of hours of PAIs to occur in a year included with Issue Charge, as used in the Non-Performance Charge Rate (*PPR*)
  - Status quo of 30 hours
  - *PPR$_{PAI}$ = (Net CONE$_{LDA}$ * 365 days) / 30 hours / 12 settlement intervals*
- Approved by the MRC and assigned to MIC

Timeline

July 11

MIC First Read

Aug. 8

MIC Vote

Single Proposal Passed with 88% Approval

Aug. 23

MRC First Read

Sept. 27

MRC/MC Endorsement

Proposal Description

To estimate the expected future Balancing Ratio (*B*) used in the default MSOC…

Take the average Balancing Ratios during the 3 Delivery Years that immediately precede the BRA using:

a) actual Balancing Ratios calculated during RTO PAIs of the Delivery Year, *and*

b) for any preceding Delivery Year with less than 360 intervals (30 hours) of RTO PAIs, estimated Balancing Ratios calculated during the intervals of the highest RTO peak loads that do not overlap a PAI

Proposal Rationale

- Straight-forward solution that augments the existing methodology by providing reasonable proxy hours and Balancing Ratios to use when no, or relatively few, actual PAIs occur
  - Peak load hours of the RTO provide reasonable proxies given correlation between hours of high demand and Emergency Actions
- Proposed Balancing Ratios appear on par with those calculated from actual data during historical RTO Emergency Actions
- Determinable in time to inform the unit-specific offer cap submission deadline for documentation
  - 120 days prior to the BRA (mid-January)

Proposal Example of a Preceding Delivery Year w/ less than 360 PAIs (30 hours)

Interval Count	Date	Time	PAI	Peak Hour	Balancing Ratio
1	Jul-18	14:15	Y	Y	93.4%
2	Jul-18	14:20	Y	Y	93.7%
3	Jul-18	14:25	Y	Y	93.7%
4	Jul-18	14:30	Y	Y	93.5%
5	Jul-18	14:35	Y	Y	93.3%
6	Jul-18	14:40	Y	Y	92.7%
7	Jul-18	14:45	Y	Y	92.4%
8	Jul-18	14:50	Y	Y	91.2%
9	Jul-18	14:55	Y	Y	90.8%
10	Aug-5	16:00	Y	Y	86.3%
11	Aug-5	16:05	Y	Y	85.7%
12	Aug-5	16:10	Y	Y	85.5%
⋮	⋮	⋮	⋮	⋮	⋮
216	Feb-2	07:10	Y	-	78.5%
217	Jul-18	14:00	-	Y	93.1%
218	Jul-18	14:05	-	Y	93.2%
219	Jul-18	14:10	-	Y	93.5%
⋮	⋮	⋮	⋮	⋮	⋮
360	Feb-2	07:05	-	Y	78.8%

a) 216 Balancing Ratios from actual PAIs (18 hours)

b) 144 estimated Balancing Ratios from highest RTO peak load hours not overlapping a PAI (12 hours)

Total of 360 intervals (30 hours) of Balancing Ratios to be averaged with the ratios of other 2 preceding DYs

Summary of Tariff and Manual 18 Revisions

- Tariff - Attachment DD
  - Section 6.4(a): Update to Balancing Ratio in the default MSOC
- Manual 18
  - Section 5.4.1: Update to Balancing Ratio in the default MSOC

Appendix

Comparison of Existing and Proposed Balancing Ratios (*B*)

Delivery Year	Existing *B*	Proposed *B*	Prior 3 DYs
2018/2019	85.0%	88.3%	11/12, 12/13, 13/14
2019/2020	81.0%	85.3%	12/13, 13/14, 14/15
2020/2021	78.5%	83.8%	13/14, 14/15, 15/16
2021/2022	78.5% *	86.8%	14/15, 15/16, 16/17

Balancing Ratios during historical RTO Emergency Actions from 2011 - 2014

Summer (16 hours): **Avg = 93.5%** Min = 87.7% Max = 95.1%

Winter (26 hours): **Avg = 78.3%** Min = 71.5% Max = 84.9%

Actual Balancing Ratios determined for Performance Assessment Intervals

- The calculated Balancing Ratio for a Performance Assessment Interval represents the percentage share of total generation capacity commitments needed to support the load and reserves on the system within the Emergency Action Area during the interval
  - i.e. (Load + Reserves) / Generation Capacity Commitments
- The Balancing Ratio is used to set the Expected Performance level of Generation Capacity Performance Resources within the Emergency Action Area during the Performance Assessment Interval
  - Expected Performance = Capacity Commitment (UCAP) x Balancing Ratio

$$\frac{\text{Total Actual Generation and Storage Performance + Net Energy Imports * + Demand Response Bonus Performance}}{\text{All Generation and Storage Committed UCAP}}$$

CP Competitive Offer

$$p = PPR \times H \times B' + \max\{0, (ACR - PPR \times H \times A')\}$$

Where:

- p: Offer price in RPM on a UCAP basis ($/MW-year)
- PPR: Non-Performance Charge Rate ($/MWh)
  - Assumed to be equivalent to the Bonus Performance Rate
- H: Expected number of Performance Assessment Hours in the year (hours/year)
- B': Expected value of balancing ratio across all Performance Assessment Hours in year
- ACR: Net ACR (net going forward costs) for a resource ($/MW-year)
- A': Expected value of availability across all Performance Assessment Hours in year

Note: The full overview and explanation of the Capacity Performance Offer Cap Logic can be found in Appendix 1 of PJM's April 10, 2015 response to FERC in Docket No. ER15-623-001

CP Competitive Offer for Low ACR Resource

Low ACR Resource is one whose net avoidable costs are less than its total expected Bonus Performance payments as an energy-only resource

- Second term of competitive offer drops to zero
- PPR substituted with Non-Performance Charge Rate

$p_{(\$/MW\text{-}year)}$ = PPR x H x B' ~~+ max{0, (ACR – PPR x H x A')}~~

$p_{(\$/MW\text{-}year)}$ = (Net CONE x 365 / H) x H x B'

$p_{(\$/MW\text{-}year)}$ = Net CONE x 365 x B'

$p_{(\$/MW\text{-}day)}$ = **Net CONE x B'** ⟶ CP default MSOC

CP Competitive Offer for High ACR Resource

High ACR Resource is one whose net avoidable costs are greater than its total expected Bonus Performance payments as an energy-only resource

- Second term of competitive offer remains greater than zero
- PPR substituted with Non-Performance Charge Rate
- Competitive offer dependent on unit-specific ACR and expected resource performance compared to B', requiring a unit-specific review of its MSOC
  - An appropriate unit-specific risk premium may also be included in the unit-specific review

$$p_{(\$/MW\text{-}year)} = PPR \times H \times B' + (ACR - PPR \times H \times A')$$

$$p_{(\$/MW\text{-}year)} = ACR + PPR \times H \times (B' - A')$$

$$p_{(\$/MW\text{-}year)} = ACR + (Net\ CONE \times 365 / H) \times H \times (B' - A')$$

$$p_{(\$/MW\text{-}day)} = ACR + Net\ CONE \times (B' - A')$$

CP Default MSOC – Example

	Capacity Resource	Energy-Only
Nameplate (MW)	100	100
Capacity Obligation (UCAP MW)	100	0
Net CONE ($/MW-day)	$250	$250
Balancing Ratio (B')	0.9	0.9
Actual Performance (A')	100	100
Expected Performance (MW)	90	-
Bonus Performance (MW)	10	100
Bonus Rate ($/MWh)	$3,042	$3,042
Bonus Performance Hours	30	30
Annual Bonus Performance ($/year)	$912,500	$9,125,000
Foregone Bonus Performance ($/year)	$8,212,500	-
Lost Opportunity Cost ($/MW-day)	**$225**	-
Default MSOC of Net CONE x B' ($/MW-day)	**$225**	-