



ORDC Regulation Requirement Shift Update

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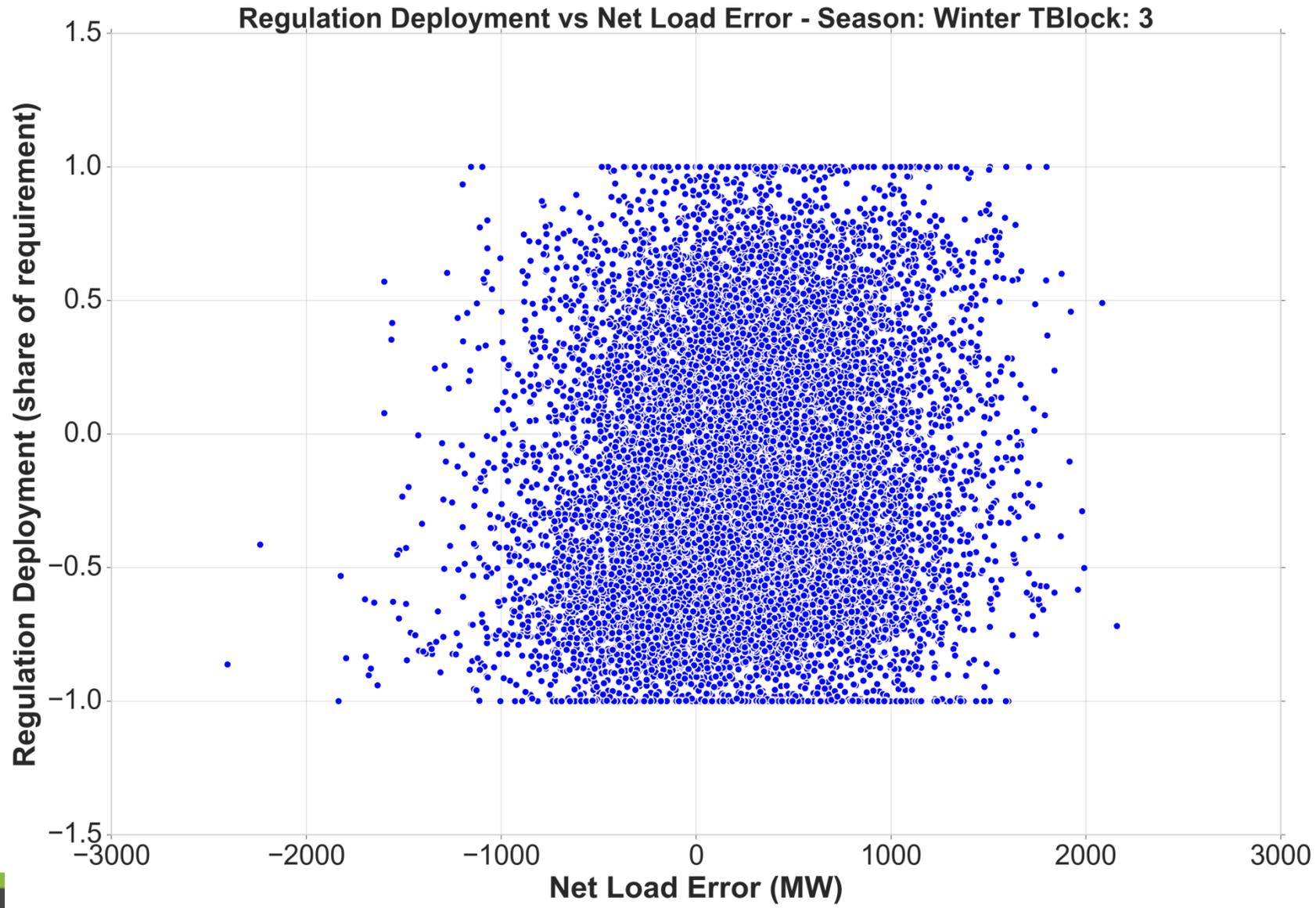
01/23/2019

- At the 11/28/2018 EPFSTF, PJM presented updated ORDCs which included a shift based on the Regulation Requirement
 - Each of the 24 season-time of day block (tblock) combinations was defined as either ramping (regulation requirement = 800 MW) or non-ramping (regulation requirement = 525 MW)
 - This definition was developed despite the fact that some of season-tblock combinations included a mix of ramping and non-ramping hours

- ORDC Regulation Requirement Partial Shift
 - Also at the 11/28/2018 EPFSTF, stakeholders requested analysis to potentially shift the ORDCs not by the full Regulation Requirement but by a portion of it that addresses the uncertainties included in the ORDC development.
- ORDC Hourly Regulation Requirement Full Shift
 - The shift is performed using the full regulation requirement but such requirement correctly captures the non-ramping or ramping nature of each hour (i.e., the shift avoids defining a complete tblock as ramping or non-ramping, as previously done)

- PJM analyzed historical Regulation Deployment data attempting to quantify the relationship between regulation deployment and some of the uncertainties included in the ORDCs, namely net load error
- The idea was to tease out what portion of the regulation requirement has historically been deployed to address net load error uncertainty. The analysis was expected to yield an approach to shift the ORDCs by a share of the regulation requirement
- Unfortunately, the historical data analyzed was inadequate to develop a model that we could confidently use to derive a partial shift
- Regulation deployment is very volatile and does not seem to be correlated with net-load error values





- The ORDCs presented at the 11/28/2018 EPFSTF included a shift based on defining an entire tblock as ramping (regulation requirement = 800 MW) or non-ramping (regulation requirement = 525 MW).
- For instance, Summer 5 comprises Hours Ending 16, 17, 18, 19. For the shift presented at the 11/28/2018 EPFSTF, Summer 5 was defined as non-ramping. However, a look at the 4 hours shows that 3 of them (16, 17, 18) are non-ramping while hour ending 19 is ramping
- PJM is adjusting the ORDCs to accurately capture the hourly regulation requirement

- The following is an illustration of the difference between the shift proposed at the 11/28/2018 EPFSTF and the one proposed today (New Shift)

Timestamp	Net Load Error	11/28/2018 Shift	New Shift	Net Load Error (11/28/2018 Shift)	Net Load Error(New Shift)
15:00	1000	525	525	475	475
16:05	500	525	525	-25	-25
17:10	-100	525	525	-625	-625
18:15	200	525	800	-325	-600

The observations with timestamp hour-ending 19 are now shifted by 800 MW (the correct regulation requirement for that hour) as opposed to 525 MW.