



Regulation Scorecard review for Quarterly Updates

Operating Committee
October 10, 2017



30 Minute Reg Signal Raise	30 Minute Reg Signal Lower	10 Minutes of Utilizing >90% of Reg with Small ACE	Tie Error outside Regulation MW	RegD not crossing 0 in 20 Minutes	Hourly Average Score
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- PJM has been monitoring hourly performance of regulation since January 9 signal implementation
 - Developed score card for tracking regulation utilization, regulation pegging, ACE excursions, and large tie errors
- Quarterly review at the OC for requirement changes will be based on this analysis

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- 30 Minutes Regulation Signal Raise/Lower
 - Utilizing the regulation signal (RegA + RegD) >90% for 30 min. or greater
 - Different from the reg-peg metrics (99% of TREG based on signal type)
- Tracking this metrics based on system need for available regulation
 - Can indicate not enough regulation on the system
 - Breaking out metric into raise/lower system analysis

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- Utilizing Regulation with Small ACE
 - When ACE is less than L10, but we are using >90% of regulation
 - Can indicate not enough regulation or incorrect RegA-RegD mix
- Tier Error outside Regulation MW
 - When regulation on the system is greater than measured tie error
 - Can indicate not enough regulation on the system
- Tracking these metrics for system and signal performance

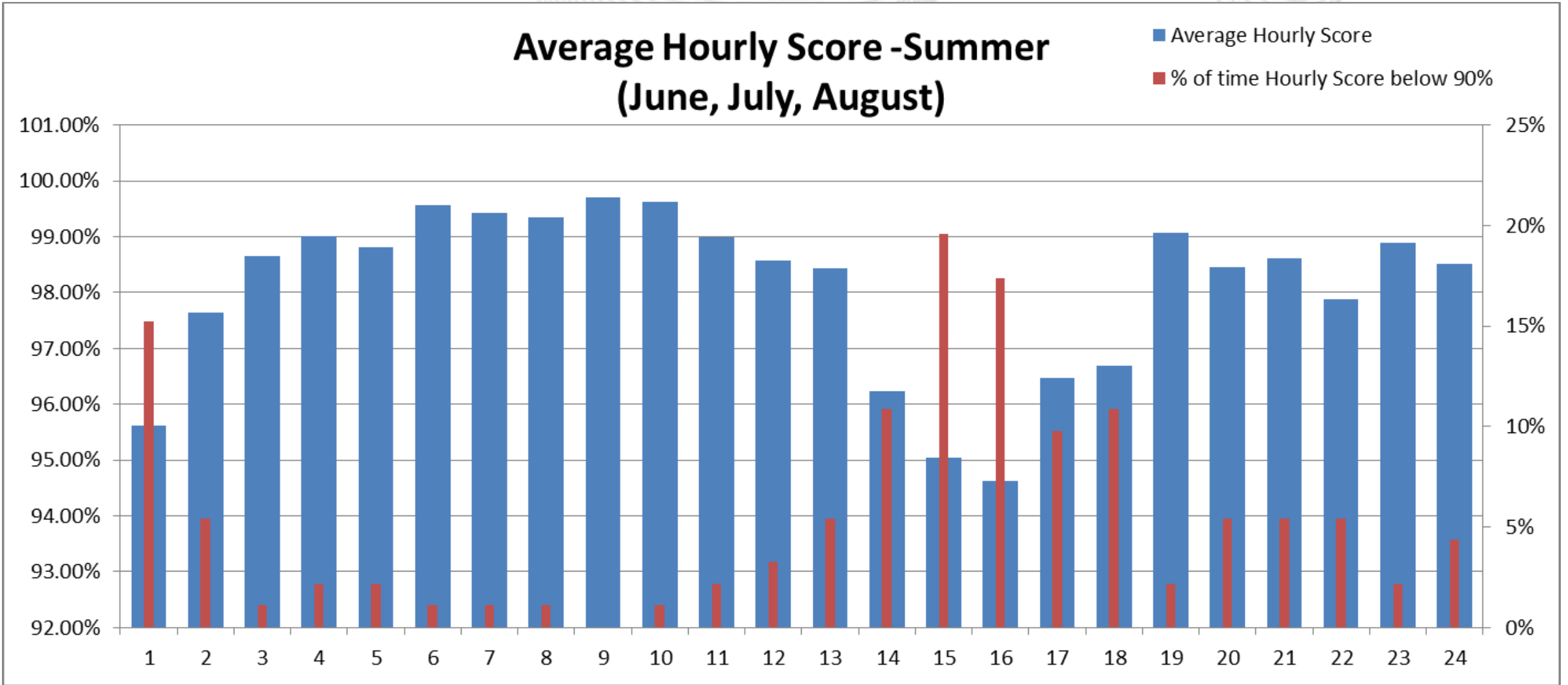
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- RegD not crossing 0 in 20 minutes
 - RegD signal is kept on one side of 0 for 20 minutes or greater
 - RegD signal is not necessarily pegged during this time
- Tracking this metrics based on signal design of conditional neutrality
 - Can indicate not enough regulation on the system
 - Can indicate incorrect mix of RegA- RegD resources

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- Weighted scores will be determined on a minute basis
 - Each minute score starts at 100 % and is decreased based on set criteria
 - Score is striving for 100%
 - More emphasis is placed on scores <90% and reoccurring lower scores in a certain time interval
- Hourly Average Scores will be determined as the average of the 60 minute scores within the hour

Average Hourly Score -Summer (June, July, August)



- 30 Minutes Regulation Signal Raise/Lower and RegD not crossing 0 in 20 minutes impact hourly score more often than other metrics
- HE15-HE16 have been the most challenging hours in Summer
 - Lower average score and higher frequency of lower hourly scores
 - With load variability and observed metrics, may need more regulation during these two hours

Appendix



Current Regulation Requirement

Season	Dates	Off-Ramp	On-Ramp	Excursion	Effective MW Requirement
Winter	Dec 1 – Feb 29	HE1 – HE4, HE10 – HE16	HE5 – HE9, HE17 – HE24	HE7 – HE8, HE18 – HE21	Non-Ramp = 525MW Ramp = 800MW
Spring	Mar 1– May 31	HE1 – HE5 HE9 – HE17	HE6 – HE8 HE18- HE24	HE7 – HE8, HE18 – HE21	Non-Ramp = 525MW Ramp = 800MW
Summer	Jun 1- Aug 31	HE1 – HE5 HE15 – HE18	HE6 – HE14 HE19- HE24	HE7 – HE8, HE18 – HE21	Non-Ramp = 525MW Ramp = 800MW
Fall	Sep 1– Nov 30	HE1 – HE5 HE9 – HE17	HE6 – HE8 HE18- HE24	HE7 – HE8, HE18 – HE21	Non-Ramp = 525MW Ramp = 800MW