



# Regulation Mileage Overview

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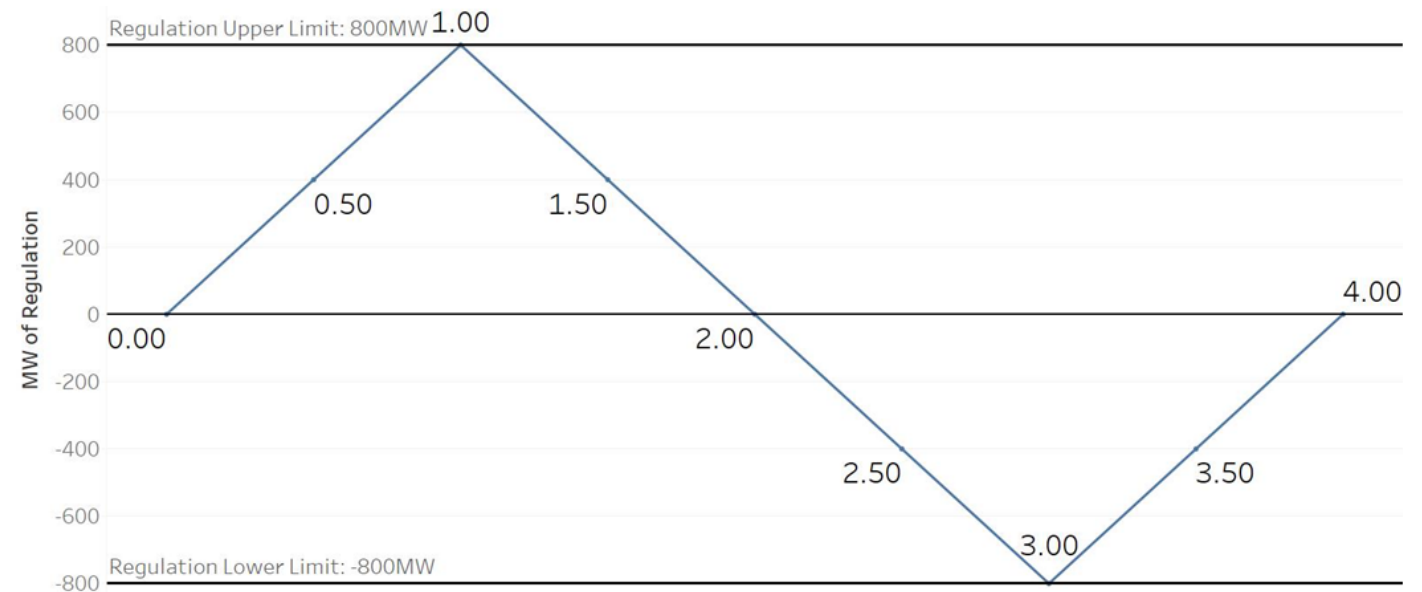
March 21, 2023

- Mileage is defined as the absolute sum of movement of the regulation signal in a given time period.

$$Mileage_{RegA} = \sum_{i=1}^n |RegA_i - RegA_{i-1}|$$

$$Mileage_{RegD} = \sum_{i=1}^n |RegD_i - RegD_{i-1}|$$

- Dimensions are  $(\Delta MW / MW)$
- 1 period (full cycle) = 4 miles



- The Regulation Market **Performance Score Calculation Engine (PSCE)** calculates
  - 5-minute Interval regulation signal mileage (used in Pricing)
  - Hourly regulation signal mileage (used for Mileage Ratio in Settlements)
  - Daily (Historical) regulation signal mileage (used in Clearing)
    - Historical mileage is a rolling 30-day average by the signal type



# Status Quo - Regulation Mileage in Clearing and Pricing

Rank = Adjusted Capability Offer Cost + Adjusted Performance Offer Cost + Adjusted Lost Opportunity Cost

$$\text{Adjusted Capability Offer Cost (\$/MW)} = \frac{\text{Capability Offer (\$/MW)}}{\text{Benefits Factor} * \text{Historic Performance Score}}$$

$$\begin{aligned} &\text{Adjusted Performance Offer Cost (\$/MW)} \\ &= \frac{\text{Performance Offer (\$/\Delta MW)} * \text{Mileage of Offered Resource Signal Type (\Delta MW/MW)}}{\text{Benefits Factor} * \text{Historic Performance Score}} \end{aligned}$$

Historic (Daily) mileage is used for clearing in ASO

Actual mileage (5-Min) is used for pricing in LPC



# Status Quo - Regulation Mileage Ratio in Settlements

Capability Credit = Five minute-integrated Raw Regulation MW \* Five minute Performance Score \* Five minute Regulation Market Capability Clearing Price (RMCCP) / 12

Performance Credit = Five minute-integrated Raw Regulation MW \* Five minute Performance Score \* **Hourly Mileage Ratio** \* Five minute Regulation Market Performance Clearing Price (RMPCP) / 12

Mileage Ratio is  $\frac{RegD\ Mileage}{RegA\ Mileage}$  for a Reg D resource and  $\frac{RegA\ Mileage}{RegA\ Mileage} = 1$  for a Reg A resource



# Regulation Mileage - Single Signal or Reg Up/Reg Down

Metrics for Status Quo and Single Signal Variations: 12-22-2022\*

SIGNAL	MILEAGE/HR
STATUS QUO ~470MW	6.32 REGA 29.69 REGD
850MW	5.97
700MW	7.69
600MW	8.96
500MW	9.01
400MW	11.4
300MW	11.33

- Single signal means only one mileage value
- Reg Up/Reg Down signals would have separate mileage but separate markets/clearing prices
- Mileage Ratio would be not applicable for either option
- Signal mileage could still be used in calculation of Adjusted Performance Offer
- Still need to demonstrate to FERC that mileage is included in Settlements because of language in FERC order 755

\*Metrics from the Regulation signal presentation at the January RMDSTF - <https://pjm.com/-/media/committees-groups/task-forces/rmdstf/2023/20230124/item-03-reg-signal-presentation-1242023.ashx>

FERC rejected PJM's previous Regulation proposal as

“...inconsistent with the Commission's regulations and Order No. 755 because it does not account for actual mileage in settlement. The Commission established in Order No. 755 that '[a] resource's performance must be measured based on the absolute amount of regulation up and regulation down it provides in response to the system operator's dispatch signal.'”

Previous PJM Regulation Proposal - Docket Nos. ER18-87-000 & ER18-87-001  
Order No. 755, FERC Stats. & Regs. ¶ 31,324 at P 133.

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