

BAL-003-2 Performance Update & Manual 12 Primary Frequency Response (PFR) Review

Ross Kelly
Performance Compliance
December 4th, 2025
Operating Committee

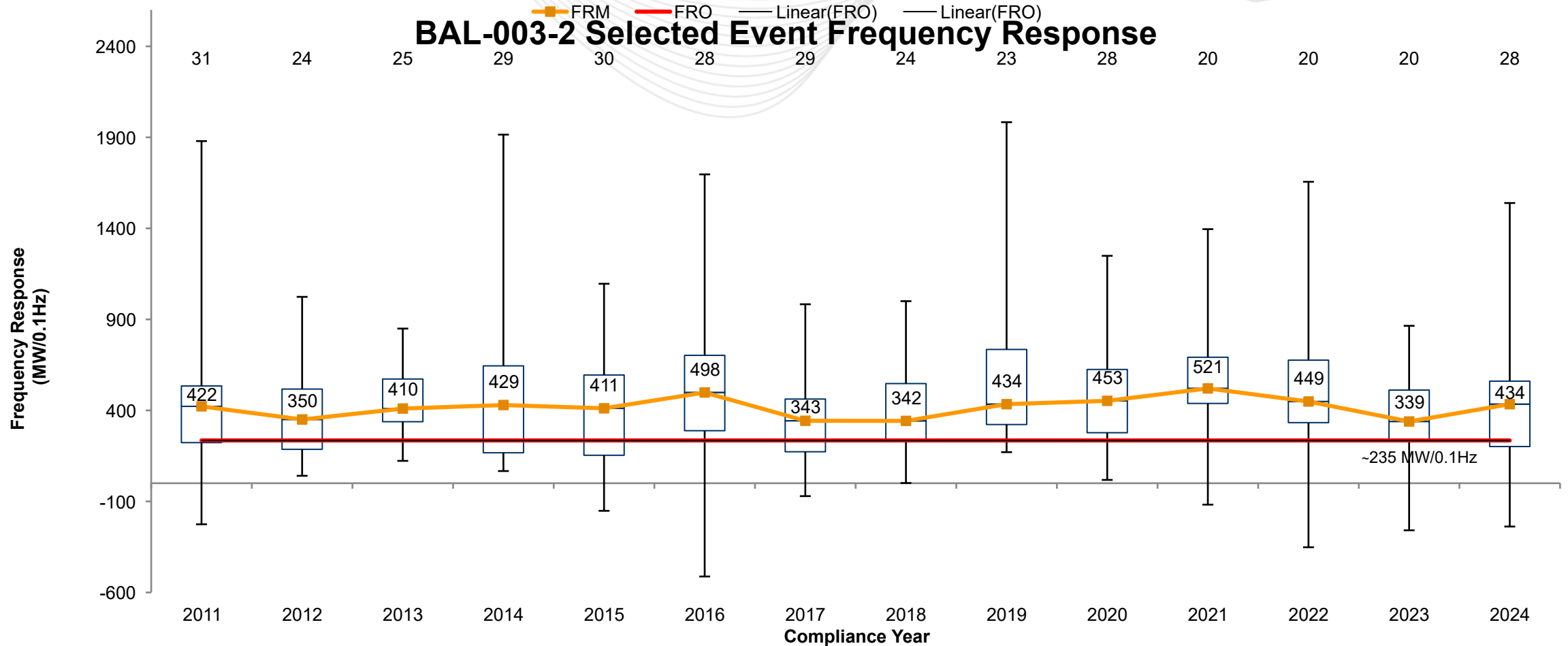
- **Purpose:** To require sufficient Frequency Response from the Balancing Authority (BA) to maintain Interconnection Frequency within predefined bounds by arresting frequency deviations and supporting frequency until the frequency is restored to its scheduled value. To provide consistent methods for measuring Frequency Response and determining the Frequency Bias Setting (FBS).
- **Applicability:** PJM is a Balancing Authority. PJM is not a member of Frequency Response Sharing Group (FRSG).
- **Effective Date:** 12/1/2020

- **R1:** Each Frequency Response Sharing Group (FRSG) or Balancing Authority (BA) that is not a member of a FRSG shall achieve an annual Frequency Response Measure (FRM) (as calculated and reported in accordance with Attachment A) that is equal to or more negative than its Frequency Response Obligation (FRO) to ensure that sufficient Frequency Response is provided by each FRSG or BA that is not a member of a FRSG to maintain Interconnection Frequency Response equal to or more negative than the Interconnection Frequency Response Obligation (IFRO).

$$FRO_{BA} = IFRO \times \frac{\text{Annual Gen}_{BA} + \text{Annual Load}_{BA}}{\text{Annual Gen}_{Int} + \text{Annual Load}_{Int}}$$

– 2025 Operating Year (OY) runs from December 2024 until November 2025

- $FRO_{PJM} \text{ for 2025 OY} = IFRO_{PJM} \times \text{Pro-rate Share}_{PJM}$
 $= (-923 \text{ MW}/0.1\text{Hz}) \times (25.46\%) = -235 \text{ MW}/0.1 \text{ Hz}$



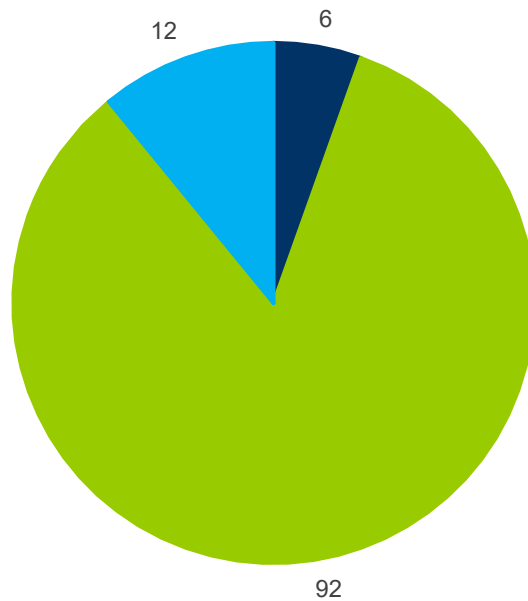
- PJM continues to monitor unit PFR performance using criteria described in PFRSTF and documented in PJM Manual 12.
 - <https://www.pjm.com/library/manual>
- Event Selection
 - Frequency goes outside +/- 40mHz deadband
 - Frequency stays outside +/- 40mHz deadband for 60 continuous seconds
 - Minimum/maximum frequency reaches +/- 53mHz

- **Today's review includes:**
 - Low Frequency Events
 - 09/18/2025 12:17:02
 - 09/28/2025 19:59:24
 - 10/18/2025 20:01:40
 - 10/31/2025 00:00:30
 - 11/23/2025 22:01:00
 - High Frequency Events
 - 10/15/2025 17:00:40

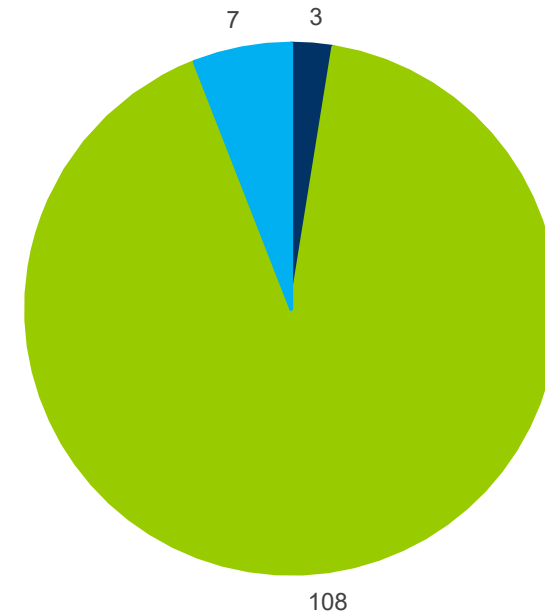
Fuel Type	# of Units evaluated
Coal	177
Hydro	25
Natural Gas	278
Oil	39
Solar	34
Wind	87
Other	7
Total	647

09/18/2025 12:17:02

09/28/2025 19:59:24

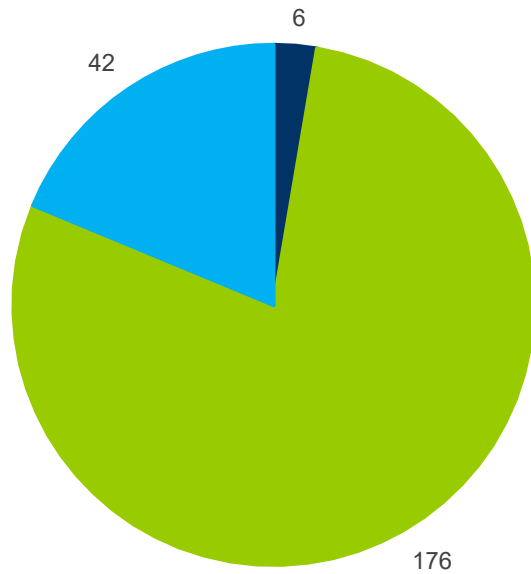


■ Further Evaluation Needed
■ No PFR Response, Response Expected
■ PFR Response, Response Expected

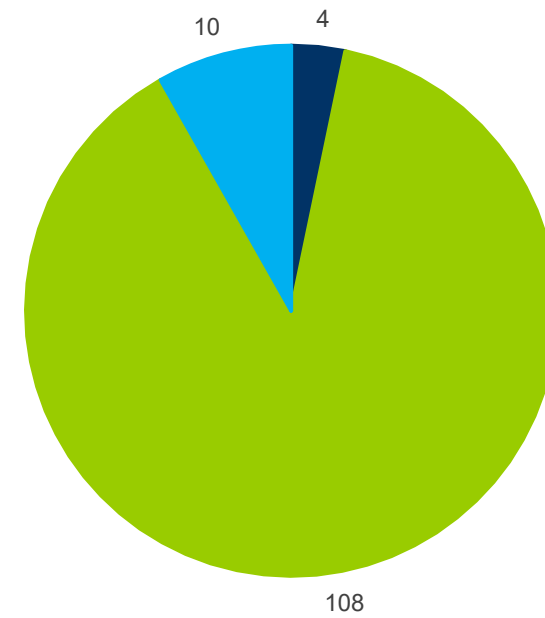


10/15/2025 17:00:40

10/18/2025 20:01:40

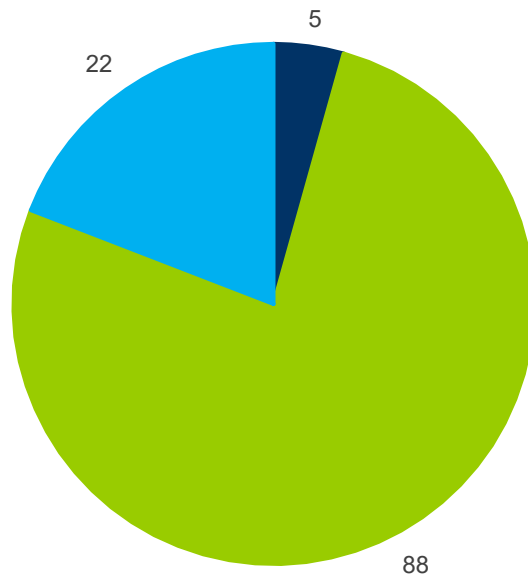


■ Further Evaluation Needed
■ No PFR Response, Response Expected
■ PFR Response, Response Expected

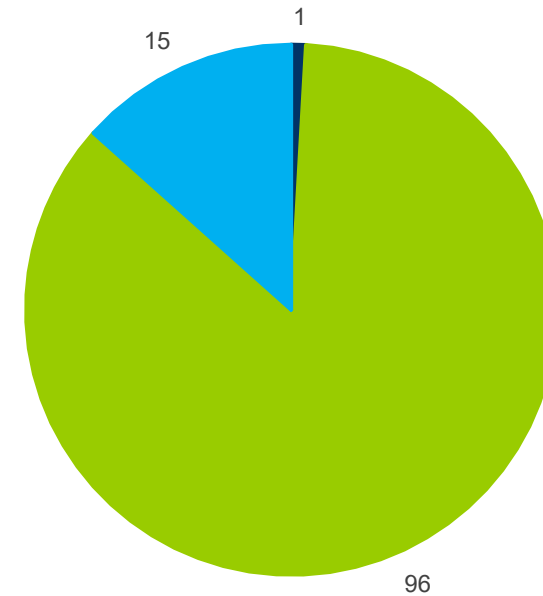


10/31/2025 00:00:30

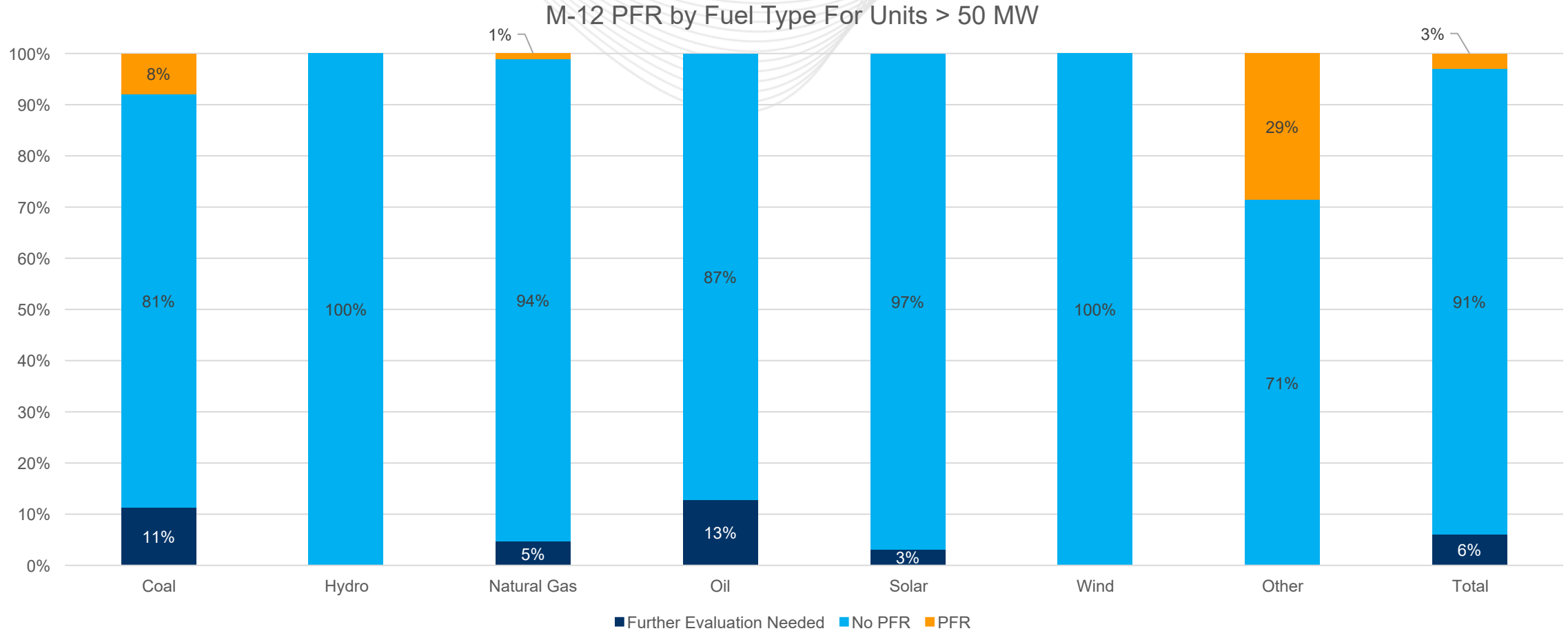
11/23/2025 22:01:00



Further Evaluation Needed
No PFR Response, Response Expected
PFR Response, Response Expected



PJM Primary Frequency Response Review



Presenter/SME:
Ross Kelly

Ross.Kelly@pjm.com

Frequency Response

FrequencyResponse@pjm.com



Member Hotline

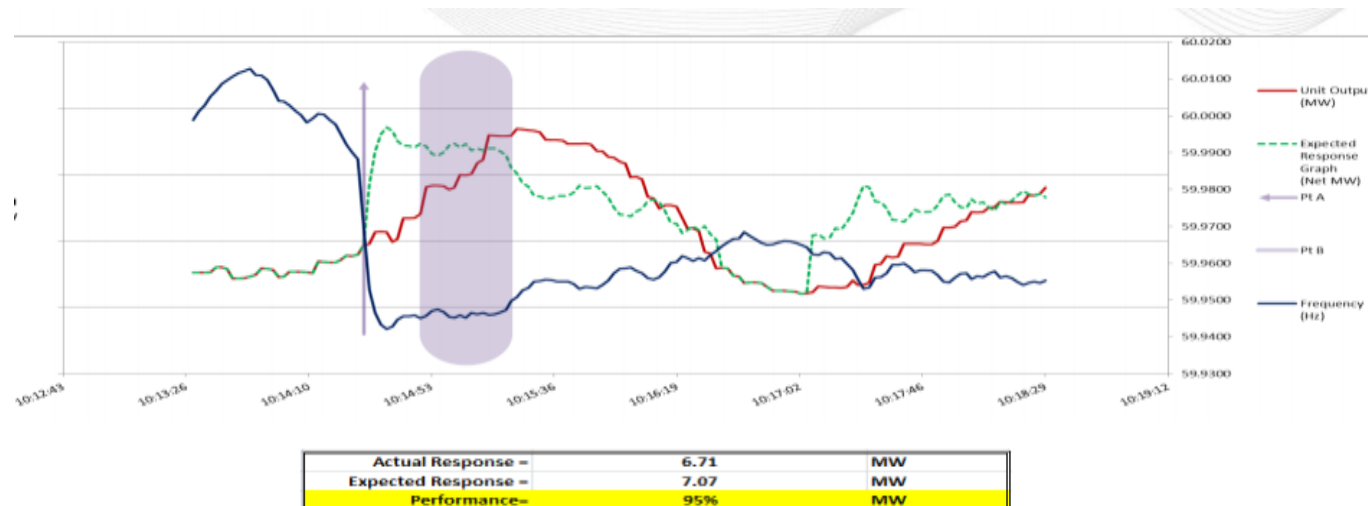
(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com

Appendix

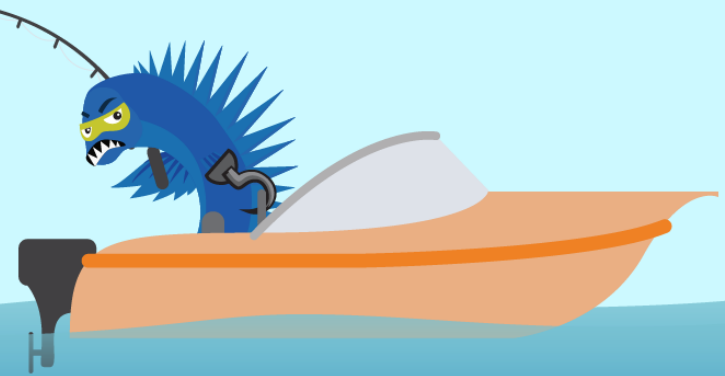
- Interactive tool for members to use to assist with understanding unit performance
 - <https://www.pjm.com/-/media/committees-groups/task-forces/pfrstf/20181127/20181127-fr-performance-events.ashx>



**PROTECT THE
POWER GRID**
**THINK BEFORE
YOU CLICK!**



**BE ALERT TO
MALICIOUS PHISHING
EMAILS**



Report suspicious email activity to PJM.
Call (610) 666-2244 or email it_ops_ctr_shift@pjm.com