



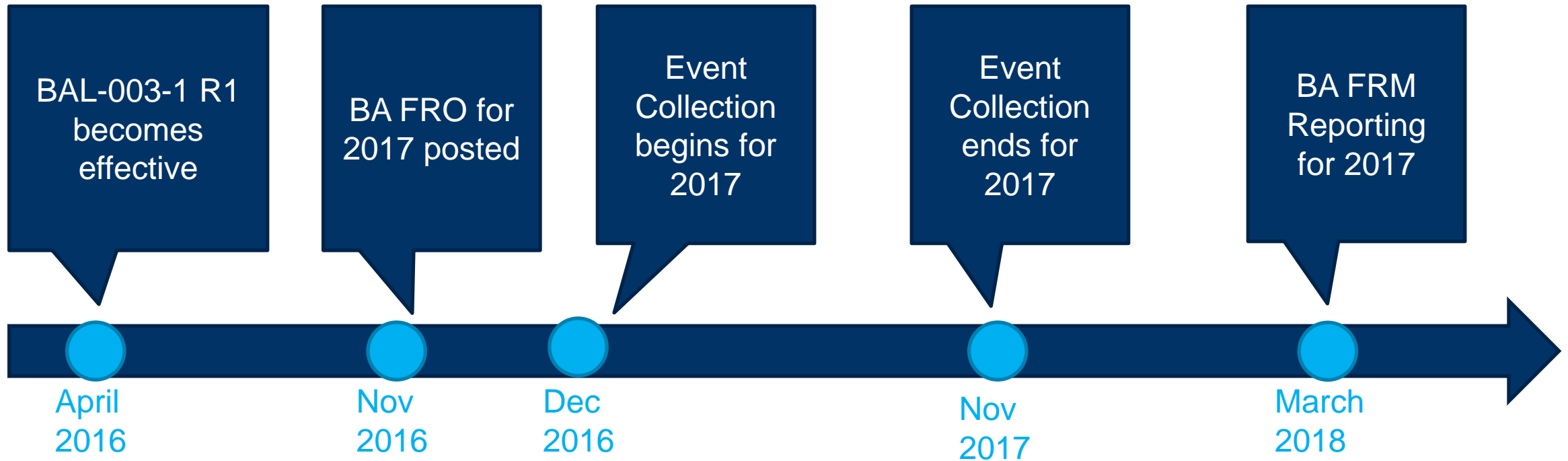
# NERC Standard BAL-003-1

## Frequency Response & Frequency Bias Setting

Operating Committee  
February 6, 2018

- BAL-003-1 Requirement 1 Timeline
- PJM Frequency Response Obligation
- PJM 2017 Frequency Response Performance
- PJM Historic Performance

**Requirement 1:** Each Balancing Authority **shall achieve an annual Frequency Response Measure (FRM) that is equal to or more negative than its Frequency Response Obligation (FRO) ...**



**Balancing Authority FRO Allocation:**

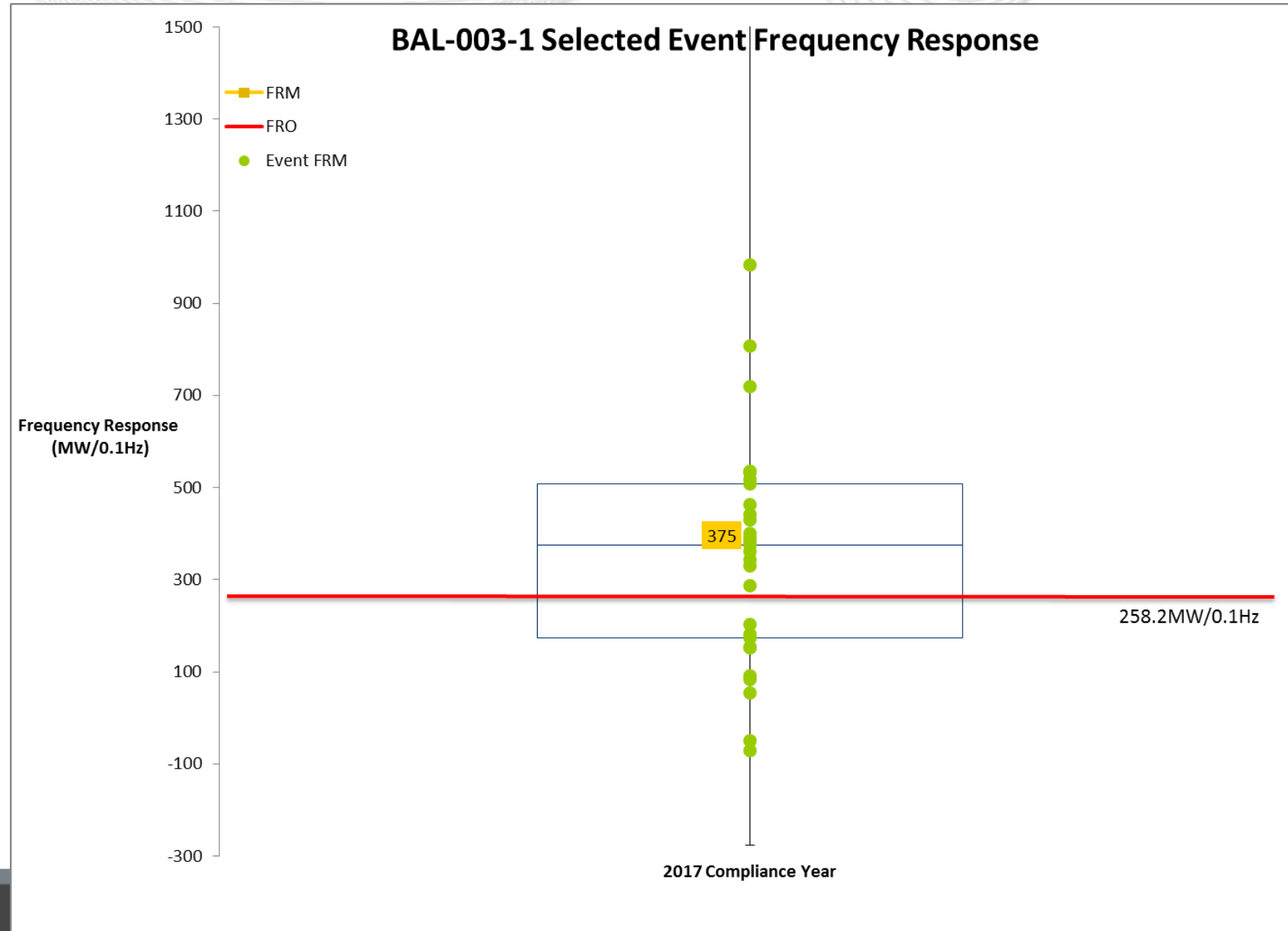
Interconnection Frequency Response Obligation x Balancing Authority Pro-rata Share

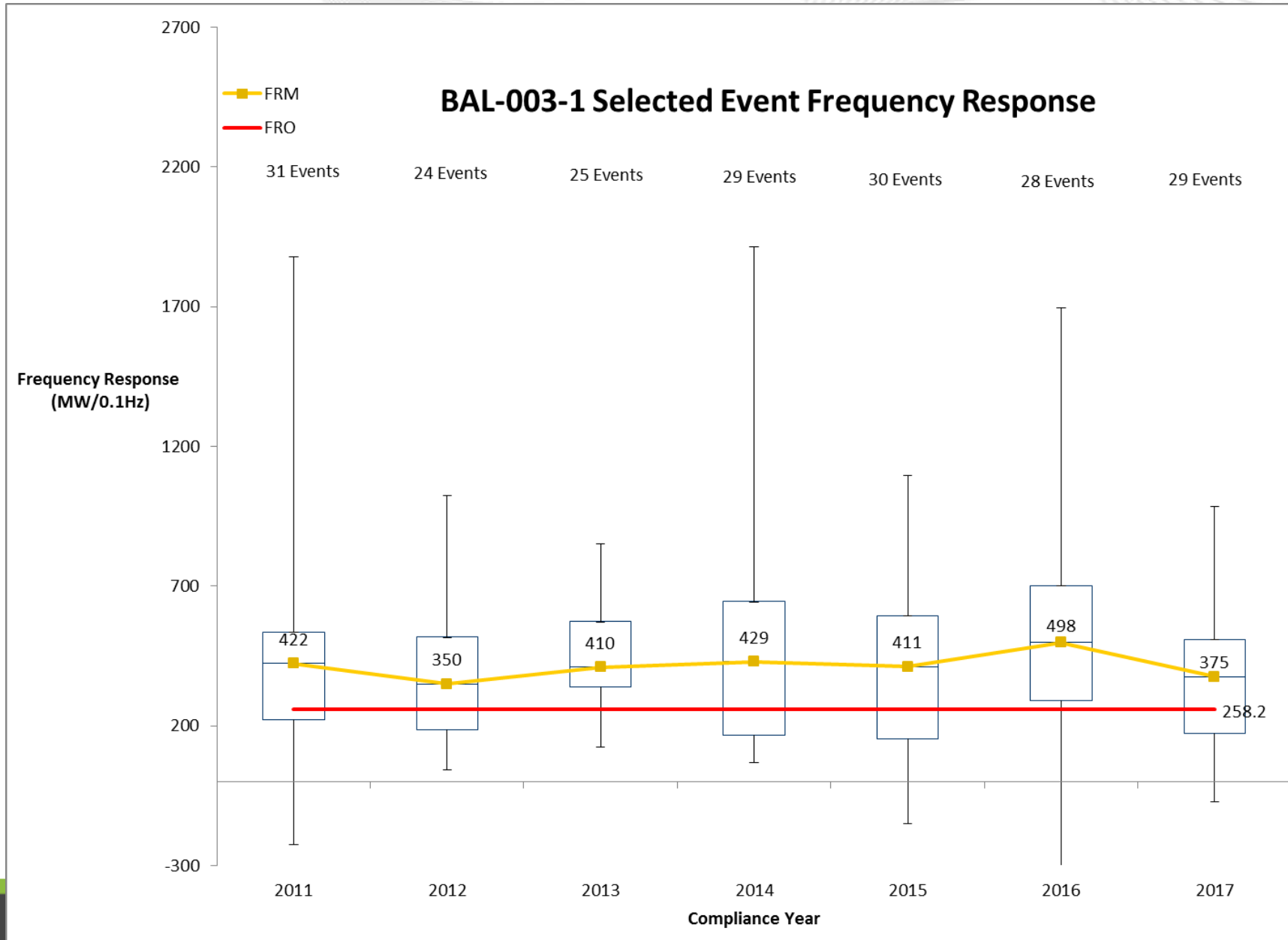
$$FRO_{BA} = IFRO \times \frac{\text{Annual Gen}_{BA} + \text{Annual Load}_{BA}}{\text{Annual Gen}_{Int} + \text{Annual Load}_{Int}}$$

**PJM FRO for 2017 operating year = (-1015MW/0.1Hz) x (25.44%) = -258.2 MW/0.1Hz**  
**2017 Operating Year: December 2016 – November 2017**

**IFRO frozen since operating year 2016 and will remain frozen for operating year 2018**

- Performance is measured as the median of all NERC selected events; frequency response measured include generator governor response & load response





# Appendix

Primary frequency response is the first stage of frequency control and is the response of generator governors and loads **to arrest locally detected changes in frequency.**

Primary frequency response is automatic, **is not driven by any centralized system,** and begins within seconds after the frequency changes, rather than minutes.



## Primary frequency is essential for reliability of the Interconnection and is

- the first line of defense
- critical for system restoration
- needed for accurate modelling and event analysis
- necessary for compliance to BAL-003-1