Performance Assessments:

- Resources expected performance will be calculated with the primary frequency control calculation
    - Frequency below governor deadband

$$MW_{\text{Pr imaryControl}} = \left[\frac{(HZ_{actual} - 60 + DB)}{(60 * Droop - DB)}\right] * (Frequency\,\text{Re}\,sponsiveCapacity) * (-1)$$

    - Frequency above governor deadband

$$MW_{\text{Pr imaryControl}} = \left[\frac{(HZ_{actual} - 60 - DB)}{(60 * Droop - DB)}\right] * (Frequency\,\text{Re}\,sponsiveCapacity) * (-1)$$

- Units will be measured on droop and deadband PJM has documented
    - Default parameters will be set to 5% droop and 36mHz dead band
    - Verification of droop and deadband settings should be performed by resource owner
- Ramp Rate will be calculated for a resource 10 minutes prior to the event start and the expected response will be adjusted for this ramp
    - Actual Response = ($AvgMW_{20\text{-}52sec}$ – $AvgMW_{\text{-}16\text{-}0sec}$)- RampRate MW
- Events for which a resource is evaluated will be determined on the following exclusions
    - If the unit is offline, no available headroom, assigned regulation

Event Selection:

- Aim to select 2-3 frequency events per month for performance assessments
    - Events will be in both directions (high frequency events and low frequency events)
    - No set number of events per month, will be driven based on system conditions
- Event Criteria that needs to be met for selection:
    - Frequency goes outside +/- 40mHz deadband
    - Frequency stays outside 40mHz deadband for 60 continuous seconds
    - Minimum/Maximum frequency reach +/- 53mHz
- Event selection criteria will be reviewed periodically by the Operating Committee for continued applicability, based on system conditions.

Quarterly Performance Reviews

- Reviews to determine if resources are frequency response or frequency non-responsive
- Quarterly review will look at an average performance over 12 month window
    - PJM will require a minimum of 3 applicable events for a resource to perform the performance review (will go back further than 12 months if needed in this case)
- Each event will be evaluated separately and the performance will be averaged for responsive/non-responsive determination
    - 50% or greater average performance will be considered responsive
- Units without RT telemetry (per M-01) Performance Assessment will not be performed with RT data
    - Required to submit data from a selected event or test results to demonstrate frequency response capability at least 1x per year

- Performance Review criteria will be reviewed periodically by the Operating Committee for continued applicability, based on system conditions.

Process for Non-Responsive units

- If PJM determines a unit is not providing Primary Frequency response based on the performance review, PJM staff will engage in conversation with the resources owner.
    - Telemetry, Operating scenarios, etc. will be discussed
- Root cause of non-responsive performance should be determined and addressed or documented
    - Addressed: non-functioning governor, data/telemetry issues, etc.
    - Documented: mill point, outside PFR operating range, etc.
- If PJM/IMM continues to see non-responsive PFR units due to not have PFR capability following outreach PJM/IMM can refer resource to FERC.