Performance Assessment for Primary Frequency Response

PFRSTF
December 1, 2017
• Resources expected performance will be calculated with the primary frequency control calculation
  
  – Frequency below governor deadband

\[
MW_{\text{PrimaryControl}} = \left[ \frac{(HZ_{\text{actual}} - 60 + DB)}{(60 \times Droop - DB)} \right] \times (FrequencyResponsiveCapacity) \times (-1)
\]

– Frequency above governor deadband

\[
MW_{\text{PrimaryControl}} = \left[ \frac{(HZ_{\text{actual}} - 60 - DB)}{(60 \times Droop - DB)} \right] \times (FrequencyResponsiveCapacity) \times (-1)
\]

– 36mHz deadband (or less), 5% droop (or less)
Pass/Fail Assessment

• Threshold will be set to determine Pass/Fail assessment
  – Unit will need to provide 50% of expected response to Pass (in MW)
  – Response measured within 20-52 seconds (alignment with BAL-003-1)
  – Sustain frequency response out to 60 seconds or duration of event

• Pass/Fail assessment due to some data quality
  – 10 second scan rates
  – Data deadband storage in historian

• Assessments will be performed on market units
  – Further breakdown assessments will be available upon request
When will assessment take place?

• PJM will reserve the right to perform performance assessment between 25-35 times a year
  – This will align with ‘clean’ frequency excursions where frequency went outside the deadband and engaged governors

• Process for non-performance
  – PJM will review first failed PFR assessment with stakeholder to discuss details of failed response
  – Subsequent failed PFR assessment will be referred to IMM/FERC for follow-up
  – No monthly payments for cost of service until demonstrated successful performance
When we will/will not evaluate a resource to provide PFR

• When we will:
  – Unit is operating between Pmin and Pmax
  – And Unit is online providing energy and has available headroom/footroom
  – And/Or Unit is assigned reserves
When we will/will not evaluate a resource to provide PFR

- When we will not:
  - Unit is not currently providing real-time energy/reserves
  - Or Unit is not operating between Pmin and Pmax
  - Or Unit has an exception
    - Long-term exception developed through the exception process
    - Short-term exception based on current operating parameters
      - Documented in EDART – max 30 day exception
  - Or Unit is providing regulation
Example of Passed Performance

- **Expected MW** 1.4MW
- **Actual MW** 1.1MW
- **Performance** 78%
Example of Failed Performance

- **Expected MW**: 2.73MW
- **Actual MW**: -7.158MW
- **Performance**: -362%