NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Frequency Response Technical Conference

Minimum Frequency Bias Setting

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RELIABILITY | ACCOUNTABILITY

Reasons for Minimum Bias

- Original Reasons for Minimum (1964)
  - Assured Frequency Bias Setting above response
    - Actual Frequency Response was much closer to 1% in 1964
    - Based on 1957 Cohn technical paper
      - Did not study Bias Settings above 200% of Frequency Response
      - Partial study of Bias Settings above 150% of Frequency Response
  - Assured all BAs participated in frequency control
    - Requirement set before Secondary Control Standards
      - A1/A2 Secondary Control standard implemented mid-1970s
      - CPS1 & 2 Secondary Control standard revised in late-1990s
      - Developing Primary Control standard currently
    - Assurance of participation no longer needed

1% Minimum Bias Problems

- Problems from Incorrect Frequency Bias Setting
  - Too Low – Causes withdrawal of Frequency Response
  - Too High – Could Cause Frequency Control Instability
- Known Problems with Minimum Frequency Bias
  - Over Bias - East 250% - West 160% - ERCOT - 112%
    - Frequency Control Instability during Eastern disturbance
    - Poor “Situational Awareness” due to over bias
  - Limits flexibility for tuning AGC Systems
  - Min. does not over-bias BAs with bias above min.

Changes to Minimum Bias

- Eliminate minimum for single BA interconnection
  - Provides flexibility for tuning AGC Systems
- Eliminate minimum for variable bias BAs
  - Simplify bias measurement
  - Minimum bias does not improve reliability
- Set minimum from 100% to 125% of FRM
  - Provides flexibility for tuning AGC on multiple BA interconnections
- Slowly reduce interconnection 1% minimum
  - Start at 0.9% and reduce by 0.1% per year max.

Questions