CURRENT INDUSTRY INITIATIVES

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Degraded Voltage Relay Technical Discussion
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INDUSTRY PERSPECTIVE

- Degraded voltage protection has been employed at nuclear plants using **various** methodologies with regulatory approval

- Improper degraded voltage protection settings can increase the potential for unnecessary separation from the offsite transmission system.

An Industry Evolved

- Analytical methods have improved
  - computer based with detailed modeling
  - Involvement with transmission organizations analysis
- Interface Agreements with Transmission Organizations
  - NERC NUC-001, NPIRs (grid criteria)
  - Regulated by FERC
- Managing and Prediction of Post-Trip Offsite Voltage
  - Use of state estimators & analysis
  - Coordination of work activities and outages
- IEEE 741 – Annex A issued, currently not endorsed by NRC

Initiatives

- NEI DVR Task Force
  - Developed technical paper in response to NRC staff recommendation on DVR protection requirements, specifically starting voltage.
    - Paper highlights industry concerns with starting voltage methodology proposed by NRC with current NP designs.
    - Conclusion is the starting voltage methodology recommended by NRC staff significantly reduces margin with respect to the offsite operating voltage.

Current Initiatives

- Industry Led Approach
  - NEI white paper developed with an overall DVR analytical methodology approach
    - NRC Staff included in development
    - Four Analyses outlined in approach
  - Concludes
    - Starting voltage can be addressed
      - Loads can be sequenced at min expected grid voltage
      - Single motor capability vs sequence start at DVR dropout
    - Margin is maintained with respect to grid min voltage
    - Ensures equipment required to operate on DG can survive degraded voltage period and restart on DG

Current Initiatives

- IEEE 741 Working Group
  - P742 “Standard for Bus Voltage Monitoring of the Class 1E Power Systems in Nuclear Power Generating Stations (NPGS)
  - Possible revision to 741 Annex on DVR methodology