Bulk Power System GMD Impacts

Next Steps in Addressing Space Weather Science and Modeling Gaps

Robert Arritt, PE
Technical Executive

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Industry Questions

- What do we prepare against?
  - How big of a storm can we have?
  - How likely is this event?
- How soon can we know if a big event is happening?
- Do we know the impacts?
- Are we doing everything we can?

Salem Nuclear Plant GSU Transformer damaged by the GMD event of March 1989. (Photos courtesy of PSE&G.)
Background

- Extreme space weather has demonstrated its capability to disrupt normal power delivery.
- EPRI has been performing GMD-related research since the late 1970’s.
- Research areas include:
  - GIC Calculation and System Modeling
  - Software Tools
  - Vulnerability Assessments
  - Mitigation Measures
  - Measurement (EPRI SUNBURST Network)
What do we prepare against?

How big of a storm should we prepare against?

- NERC TPL-007 – GMD Vulnerability Assessment – Regulatory Compliance
  - GMD Vulnerability assessment begins with 1-in-100-year GMD Storm Definition

How soon can we know?

- Long-term (>2hrs ahead) and short-term forecast capabilities
  - Increase time to assess the system
  - Time to implement safe-posturing
Do we know the impacts?

Harmonic/Thermal Analysis

- Predicting harmonic/thermal responses

Monitoring

- Obtaining GIC monitor data from planning area

Model Validation

- GIC and magnetometer data to validate models

Answering Key Compliance Requirements for the 1-in-100-year Event
Do we know the impacts?

- GMD Modeling tools
Are we doing everything we can?

GIC Blocker Field Demonstration

August 4, 2023 Event
Are we doing everything we can?

- Collaborative Research
- Industry meetings
- NERC’s GMD Meetings
- NASA Engagement
- DOE Engagement
- NSF Engagement
- NOAA Collaboration

Continued Engagement is Critical in GMD Preparedness
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