NERC

NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Protection Coordination Workshop

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to ensure the reliability of the bulk power system

System Protection and Control Performance Improvement Initiative

The Initiative

- System Protection and Control Performance Improvement Initiative – aka SPI
- Launched April 24, 2009
- NERC Board recognition of the importance of system protection to reliability
- Goal: Improve BES reliability
- Purpose: Improve the performance of power system Protection Systems through fostering technical excellence in protection and control system design, coordination, and practices.

The Initiative

- Elevate System Protection and Control Task Force to Subcommittee status
  - Increased emphasis on the importance of protection
- Collaborative efforts with:
  - IEEE Power & Energy Society
  - IEEE Power System Relay Committee
  - Bridge between IEEE standards and NERC system performance requirements (in NERC standards)
- Coordinate Protection Standards Philosophies and Standards Work
  - Technical basis for all protection standards changes
  - Reduce discrepancies

SPI Targeted Areas

- PRC Standards Technical Support
  - SPCS to provide technical SME support to Standards process
- Relay Loadability
  - Standard PRC-023 – Relay Loadability passed by NERC Board February 2008, awaiting FERC approval
- Protection System Reliability (redundancy)
  - SPCS Technical Reference Document & SAR
- Generator Frequency and Voltage Protective Relay Coordination
  - Standards Project 2007-09 – Generator Verification
  - Drafting of Standard PRC-024-1 — Generator Frequency and Voltage Protective Relay Settings

SPI Targeted Areas

- Transmission and Generation Protection System Misoperations
  - Technical review of PRC-004 -- Analysis and Mitigation of Transmission and Generation Protection System Misoperations
  - Includes NERC-wide definition of protection misoperations for NERC reporting and system performance metrics
- Protection System Maintenance
  - SPCTF 2007 Technical Reference Document on Protection System Maintenance
  - Project 2007-17 – Transmission and Generation Protection System Maintenance and Testing, PRC-005 in re-drafting phase

SPI Targeted Areas

- Protection System Coordination
  - Transmission Protection Coordination
    - Support for revisions to PRC-001
  - Trans & Gen Protection Coordination – IEEE PSRC collaboration
    - SPCS Technical Reference – Power Plant and Transmission System Protection Coordination – support for revisions to PRC-001
- BES System Performance & Protection Coordination with Generator Controls
  - Improved modeling of governors and other generator controls
  - New control models need to be applied
  - Model validation to actual system performance essential

SPI Targeted Areas

- BES System Performance & Protection Coordination with Turbine/Boiler Controls
  - Next thrust of the SPI
  - Response to a leading trend in system disturbances
  - Largely uncharted area for modeling by planners
  - Discussions with industry experts and turbine control manufacturers on appropriate level of modeling (detailed modeling not appropriate)

Power Plant and Transmission System Protection Coordination

Background

- Generation – Transmission protection miscoordination accounted for 20 percent of the protection misoperations that were causal or contributory to significant disturbances (2005-2009)
- Technical Reference Document published in December 2009
- Technical bridging document between IEEE Standards and Guides and NERC Standards
- Series of workshops and webinars

Technical Reference Document Team

- Joe Uchiyama – US Bureau of Reclamation
- Jon Gardell – Quanta Technology
- Tom Wiedman – Wiedman Power System Consulting Ltd., Corp.
- Murty Yalla – Beckwith Electric Co. Inc.
- Jon Sykes – PG&E (formerly with SRP)
- Hank Miller – AEP
- Phil Winston – Southern Company
- John Ciufo – Hydro One (SPCS Chair)
- Phil Tatro – NERC (formerly with National Grid)
- Bob Cummings – NERC