PJM Protection Standards
Manual 07 Revision 3
Presented to PJM Planning Committee

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PJM Manual 07: PJM Protection Standards

- Released on 11/16/2011
- Established the minimum design standards and requirements for protection systems associated with bulk power facilities within PJM
- Develop from PJM Relay Subcommittee “Protective Relaying Philosophy and Design Guidelines” Document
Revision 01 (02/27/2014)

• Revised Section 7 - Line Protection
• Revised Section 8 - Substation Transformer Protection
Overview of Past Revisions

Revision 02 (04/29/2016)

- Revisions made to the following Sections:
  - Section 7: Line Protection
  - Section 8: Substation Transformer Protection
  - Appendix B: Direct Transfer Trip
  - Appendix C: Dual Pilot Channels

- Removed Appendix F: Triggered Current Limiters
• Revisions made to Section 17
  – added Remedial Action Scheme (RAS) to SPS
  – SPS/RAS term
• Added Reliability Section to M07
• Removed version number to reference standards
  – e.g. PRC-023
Section 17: Special Protection Schemes/Remedial Action Schemes

- Added term Remedial Action Scheme (RAS)
  - Official NERC definition
  - RAS are not Protection Systems; however, they may share components with Protection Systems.
- Term SPS replaced with SPS/RAS throughout Section 17
Section 2: Protection Philosophy and Reliability

- Outlines the requirements and recommendations to assure reliability of Protection Systems. The following apply to all new (BES) facilities:

2.2.1 Test Switches
- Isolation of AC and DC connections to protective and auxiliary relays

2.2.2 Instrument Transformers
- Independent instrument transformers for primary and backup relaying

2.2.3 Communication Channels
- Dual pilot communication channels if dual pilot required for stability and/or coordination
2.2.4 Station Batteries

- Primary and BU schemes - independently protected DC control circuits
  - Each battery required to have its own charger
- Subs > 300 kV, dual station batteries are preferred
  - If single battery utilized, dual battery chargers required
- Charger and DC control circuits shall be protected against short circuits.
- DC control systems - continuously monitored and alarm for abnormal voltage
  - At a minimum, a low battery voltage condition shall be reported remotely
- Chargers recommended - continuously monitored and alarmed.
  - If single battery / single charger, charger failure and Loss of AC Source reported remotely
2.2.5 Station Service (AC Supply)

- Two sources of Station Service AC supply
  - Each capable of carrying all critical load associated with protection
Other Revisions

• Removed version number to reference standards
  – e.g. PRC-023 instead of PRC-023-1