

# NPCC PRC-002-NPCC-1 DISTURBANCE MONITORING STANDARD

## Comments and Comparison to NERC PRC-002 Draft

### Sequence of Events

- SOE required at all substations and locations where circuit breaker (CB) operation affects continuity of service to radial load >300MW
- SOE Points:
  - Transmission and Generator CB positions
  - Protective Relay Tripping
  - Teleprotection keying and receiving

### **NOTES:**

1. No mention of time-stamp accuracy as in the NERC draft standard.
2. NERC draft standard only requires CB position.

### Fault Recording

- Defines elements to be monitored
- Requires capability to determine current-zero time for loss of BES elements
- Requires monitoring sufficient electrical quantities to determine 3-ph voltage and current for defined elements, plus polarizing, frequency, and real and reactive power.
- Defines record length at 1 second at minimum recording rate of 16-samples/cycle
- Defines three trigger functions:
  - Phase overcurrent
  - Neutral overcurrent
  - Phase undervoltage
- Allows for documented deviation from defined trigger functions

### **NOTES:**

1. Defines individual generator interconnections and not generators as in the NERC draft standard.
2. Determination of current zero time is unique to this standard. It appears to define this as the end of an event and infers that SOE points are not sufficient in determining the end of the event.
3. No pre-trigger or post trigger requirements
4. No mention of time synchronization or time stamp accuracy

### Dynamic Disturbance Recording

- Defines where DDRs are to be installed
- Defines minimum record length

- Requires use of at least one of four defined triggers
- Reliability Coordinator establishes requirements for DDR monitoring
- Reliability Coordinator documents deviations from required triggers
- Reliability Coordinator specify DDR requirements including triggers
- TO and GO responsible for installation of DDRs

**NOTES:**

1. Locations for DDRs is different that NERC draft standard
2. No pre-trigger or post-trigger requirements
3. Record length in NPCC Standard is 60 seconds and 90 seconds ( 3 minutes) in NERC Standard
4. Reliability Coordinator ensures DDR installed and defines settings and triggers such that quantities are monitored or derived (R10)

Maintenance and Testing

- Requires TO and GOs establish a maintenance and testing program
- Documentation of maintenance and testing procedures
- Monthly verification of communication channels for remote access
- Monthly verification of time synchronization
- Calibration check of settings every two years
- Requirement of returning failed units to service within 90-days

**NOTES:**

1. Calibration check of settings every two years is excessive. Protective relay maintenance intervals are six years for this type of check. DME should have same interval since DFR microprocessor based platforms are similar to those of protective relays.
2. Good baseline for inclusion in NERC draft standard.

Additional Requirements

- Data provided within 30-days upon request
- Data shall be:
  - Capable of being viewed with COMTRADE analysis tools
  - Conform to IEEE Std C37.232
  - Fault and DDR records shall contain all monitored channels.
  - SOE include; Station Name, date & time resolved to millisecond, Point name, and status

**NOTES:**

1. The requirement for providing data within 30-days of a request suggests records need to be available for a longer period of time than the current 10-days in the

NERC draft standard. NERC draft standard has the same 30-days in the compliance section

2. Viewing in COMTRADE is a requirement in NPCC Standard. In NERC Standard it is in compliance
3. Data format requirements is only instance where resolving time for SOE to the millisecond is documented.