



Midwest Reliability Organization Procedure for NERC PRC-003-1

**BOD Approved: December 15th, 2011
Effective: January 1st, 2012**

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A. Purpose

The MRO has established this Procedure to define the data submittal requirements for the purposes of reviewing Transmission and Generation Protection System Misoperations that occur within its region.

B. Scope

The requirements of the NERC standards concerning Transmission and Generation Protection System Misoperations are identified as in scope with this Procedure. These include PRC-003-1 and PRC-004-2. Additionally, this Procedure shall attempt to address the Protection System Misoperations data collection requirements that the MRO has been directed to incorporate by NERC.

C. Applicability

- 1) Any Registered Entity within the MRO regional footprint who is a,
 - a) Transmission Owner
 - b) Generator Owners
 - c) Distribution Provider

D. NERC Definitions

- 1) **Protection System:**
 - Protective relays which respond to electrical quantities,
 - Communications systems necessary for correct operation of protective functions
 - Voltage and current sensing devices providing inputs to protective relays,
 - Station dc supply associated with protective functions (including batteries, battery chargers, and non-battery-based dc supply)
 - Control circuitry associated with protective functions through the trip coil(s) of the circuit breakers or other interrupting devices.
- 2) **Misoperation:**
 - Any failure of a Protection System element to operate within the specified time when a fault or abnormal condition occurs within a zone of protection.
 - Any operation for a fault not within a zone of protection (other than operation as backup protection for a fault in an adjacent zone that is not cleared within a specified time for the protection for that zone).
 - Any unintentional Protection System operation when no fault or other abnormal condition has occurred unrelated to on-site maintenance and testing activity.

E. References

- 1) NERC Standard PRC-003-1
- 2) NERC Standard PRC-004-2
- 3) MRO Misoperations Reporting Template

F. Requirements to Identify, Analyze, and Mitigate Misoperations

- 1) Each Transmission Owner, Distribution Provider that owns a transmission Protection System, and Generator Owner shall establish, document, maintain, and implement a process to identify and analyze its Protection System Misoperations.
- 2) Each Transmission Owner, Distribution Provider that owns a transmission Protection System, and Generator Owner shall establish, document, maintain, and implement a process for developing and implementing Corrective Action Plans to avoid future Misoperations of a similar nature.
- 3) Each Transmission Owner, Distribution Provider that owns a transmission Protection System, and Generator Owner shall report to the MRO, any data concerning Protection System Misoperations it has identified in accordance with MRO data request requirements.

G. Protection Systems to be Considered

- 1) Any Protection System which is intended to protect the following

- a) An individual generating unit > 20 MVA (gross nameplate rating) and is directly connected to the bulk power system.
- b) Generating plant/facility > 75 MVA (gross aggregate nameplate rating) or when the entity has responsibility for any facility consisting of one or more units that are connected to the bulk power system at a common bus with total generation above 75 MVA gross nameplate rating.
- c) Any generator, regardless of size, that is a Blackstart Resource designated as part of a transmission operator entity's restoration plan.
- d) A transmission element associated with the bulk power system 100 kV and above. For transformers this voltage refers to the secondary winding.

H. Requirements on Identifying Protection System Components

- 1) The following criteria shall be used to identify Protection System components:
 - a) Any protective relay which responds to electrical quantities. (devices such as, but not limited to, relays that measure pressure, vibrations, seismic, thermal, gas accumulation, and light would not be included.)
 - b) Any component that is part of a communication system that is necessary for correct operation of protective functions.
 - c) Any voltage or current sensing device providing inputs to protective relays.
 - d) Station DC supply components associated with protective functions (including station batteries, battery chargers, and non-battery-based dc supply).
 - e) Any component that is part of the control circuitry associated with the implementation of protective functions. This includes the electrical interface with interrupting devices (including trip coils and auxiliary contacts).
- 2) Protection Systems such as Special Protection Systems, UFLS, and UVLS are not covered in this Procedure.

I. Protection System Misoperations to be Reported

- 1) The following types of Misoperations should be reported to the MRO:
 - a) Any failure of a Protection System element to operate when a fault or abnormal condition occurs within a zone of protection.
 - b) Any failure of a Protection System element that is slower than planned to operate when a fault or abnormal condition occurs within the zone of protection.
 - c) Any unnecessary Protection System operation for a fault not within the zone of protection. An example of this type of Misoperation is an over-trip due to lack of coordination between Protection Systems.
 - d) Any unnecessary Protection System operation when no fault or other abnormal condition has occurred.
- 2) The following types of Misoperations or events should not be reported to the MRO:
 - a) Failure to automatically reclose after a fault is not a reportable misoperation.
 - b) Operations which are initiated by control systems (not by Protection Systems), such as those associated with generator controls, or turbine/boiler controls, SVCs, FACTS, HVdc, circuit breaker mechanism, or other facility control systems, are not reportable misoperations.



- c) Slow breaker operation caused by mechanical malfunction does not constitute a reportable misoperation.
- d) Lack of targeting, such as when a high-speed pilot system is beat out by a high-speed zone, is not a reportable misoperation. If a fault or abnormal condition is cleared in the time normally expected with proper functioning of at least one Protection System, failure of a Protection System element is not a reportable misoperation.
- e) Delayed Fault Clearing, where a high-speed system is employed but is not essential for transmission system performance, is not a reportable misoperation.
- f) Operation as properly coordinated backup protection for a fault in an adjacent zone that is not cleared within the specified time for the protection for that adjacent zone is not a reportable Misoperation.
- g) An operation that is caused by on-site maintenance, testing, construction and/or commissioning activities is not a reportable Misoperation.

J. Requirements to Report Misoperations

- 1) Each Transmission Owner, Distribution Provider that owns a transmission Protection System, and Generator Owner shall report any and all requested data concerning Protection System Misoperations to the MRO on request.

K. Review, Approval, and Implementation

- 1) The MRO Operating Committee is responsible for approving and maintaining this Procedure.
- 2) MRO Staff are responsible for this Procedure's implementation.
- 3) These Requirements are reviewed and approved on no less than an annual basis, and updated as needed.

Revision History

Date	Revisions /Reviewed	Developed By	Approved By	Effective Date
12/15/2011	MRO BOD Approved Draft	MRO OC	MRO BOD	01/01/2012

