

# NERC

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

# Project 2007-06 System Protection Coordination (PRC-027-1) Industry Webinar

Standard Drafting Team Members  
December 5, 2013

**RELIABILITY | ACCOUNTABILITY**



- Welcome and Introductions
- Administrative Items
  - NERC Antitrust Guidelines and Disclaimer
  - Webinar Format
- Standard Drafting Team (SDT) Members
- Presenters
- Project Background
- PRC-027-1 – Overview of Draft 4
- Question and Answer Session

- NERC Antitrust Guidelines

- It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition.

- **Disclaimer**
  - Participants are reminded that this meeting is public. Notice of the meeting was posted on the NERC website and widely distributed. The notice included the number for dial-in participation. Participants should keep in mind that the audience may include members of the press and representatives of various governmental authorities, in addition to the expected participation by industry stakeholders.
  - Wording in this presentation is used for illustrative purposes and may not reflect the exact draft of the posted standard.

- Two hour webinar
  - Presentation
    - Project Background
    - Key Issues
    - Requirements
  - Informal Question and Answer Session
    - You may submit questions at any time via the chat feature or when the operator assisted phone line is opened after the presentation
    - Presenters will attempt to address each question
    - Some questions may require SDT discussion

Member	Registered Entity
Phil Winston, Chair	Southern Company
Bill Middaugh, Vice Chair	Tri-State G & T Association
Forrest Brock	Western Farmers
David Cirka	National Grid
Sam Francis	Oncor Electric Delivery
Jeff Iler	American Electric Power
Phil Waudby	Consumers Energy
Kevin Wempe	Kansas City Power and Light

- Industry Stakeholders
  - Phil Winston, SDT Chair, Southern Company
  - SDT Members
- NERC Staff
  - Al McMeekin, Standards Developer
  - Bill Edwards, Counsel – Standards

- PRC-001 contains operating and planning time frame requirements
  - SDT transferred operating requirements R2, R5, and R6 to Project 2007-03 Real-time Operations for inclusion in TOP-003-2
- NERC Board of Trustees adopted Reliability Standards TOP-003-2 and PRC-001-2 on May 9, 2012
  - Requirements R2, R5, and R6 of PRC-001-1 – System Protection Coordination retired because they are now addressed in proposed TOP-003-2
  - PRC-001-2 has three remaining requirements
    - One training requirement
    - Two coordination requirements (planning time frame)

- FERC issued a Notice of Proposed Rulemaking on November 21, 2013 proposing to remand NERC's proposed revisions to the TOP standards
- PRC-001-3 is posted concurrently with PRC-027-1 and contains one remaining training requirement
  - The two coordination requirements R2 and R3 are retired by PRC-027-1

- Address FERC directives in Order 693 (PRC-001)
- Address issues with PRC-001 identified by the System Protection and Control Task Force (SPCTF), now the System Protection Control Subcommittee (SPCS)
  - Applies to Transmission Operators, Generator Operators, and Balancing Authorities
    - SDT changed the Applicability to Transmission Owners, Generator Owners, and Distribution Providers
  - Does not require coordination of existing systems
    - SDT included such a requirement (for Interconnecting Elements) – 60 months

- PRC-001 does not require coordination to be periodically reviewed/updated
  - SDT included a Fault Current trigger – 60 month review

- **Purpose:**

To coordinate Protection Systems for Interconnecting Elements, such that Protection System components operate in the intended sequence during Faults.

## Applicability:

- **4.1 Functional Entities:**

- 4.1.1 Transmission Owner

- 4.1.2 Generator Owner

- 4.1.3 Distribution Provider (that own Protection Systems identified in the Facilities section 4.2 below)

- **4.2 Facilities:**

- Protection Systems:

- a) installed for the purpose of detecting Faults on Interconnecting Elements, and

- b) that require coordination for isolating those faulted Elements.

## Definitions:

### **Interconnecting Element**

A Bulk Electric System (BES) Element that electrically joins Facilities:

- a) owned by separate Registered Entities, or
- b) owned by the same Registered Entity that represents multiple functional entity responsibilities.

(Transmission Owner, Generator Owner, or Distribution Provider)

### **Protection System Coordination Study**

A study documenting that existing or proposed Protection Systems operate in the intended sequence for clearing Faults.

## 1.1 Perform a Protection System Coordination Study (PSCS) for each of its Interconnecting Elements as follows:

- Within 60 calendar months after the effective date of this standard, if no PSCS for that Interconnecting Element exists.
- Within 12 calendar months after determining or being notified of a 10% or greater change in Fault current at an interconnecting bus, as described in Requirement R2, or technically justify why such a study is not required.
- According to an agreed upon time frame to meet the schedule when proposing or being notified of a change, as described in Requirement R3, Part 3.1, or technically justify why such a study is not required.
- Within six calendar months of being notified of a change as described in Requirement R3, Part 3.3, or technically justify why such a study is not required.

**1.2. Within 90 calendar days after the completion of each PSCS or the technical justification, provide to the other owner(s) of the Protection System(s) associated with the Interconnecting Element(s): a summary of the results of each PSCS performed, including, at a minimum:**

- Protection Systems reviewed,
- the associated Fault current(s) used,
- any issues identified, and
- any revisions or actions proposed;
- or the technical justification.

**For each Interconnecting Element on its System, the Transmission Owner shall, once every 60 calendar months:**

- 2.1.** Perform a short circuit study to determine the present maximum available Fault current values (single line to ground and 3-phase) at its interconnecting bus(s) where a PSCS is available (per Requirement R1).
- 2.2.** Calculate the percent change between the Fault current values used in the most recent PSCS and the present Fault current values.

$$\% \text{ Change} = \left| \frac{I_{scs} - I_{pscs}}{I_{pscs}} \right| \times 100$$

Where:  $I_{scs}$  = Fault current value from present short circuit study

And:  $I_{pscs}$  = Fault current value used in the most recent PSCS

**2.2.1** Within 30 calendar days after identification of a change of 10% or greater in either single line to ground or 3-phase Fault current, provide the updated Fault current values ( $I_{scs}$ ) to each owner of the Protection System(s) associated with the Interconnecting Element(s).

## **Shall provide to each Owner connected to the same Interconnecting Element:**

- 3.1.** Details for any proposed change or addition, either at an existing or new Facility associated with the Interconnecting Element; or at other Facilities when the proposed change modifies the conditions used in the coordination of Protection Systems associated with the Interconnecting Element(s).
- 3.2.** Requested information related to the coordination of Protection Systems associated with an Interconnecting Element, within 30 calendar days of receiving a request or according to an agreed-upon schedule.
- 3.3.** Within 30 calendar days of making the change, details of permanent changes made to Protection Systems associated with the Interconnecting Element during Misoperation investigations, commissioning, maintenance activities, or emergency replacements made due to failures of Protection System components.

**Each Owner that received a summary of the results of a PSCS or a technical justification shall, within 90 calendar days after receipt or according to an agreed upon schedule, review the summary of the results or the technical justification, and respond to the other owner(s) either:**

- Confirming that the summary of the results was reviewed and no coordination issues were identified, or
- Confirming that the summary of the results was reviewed and any identified coordination issue(s) were noted, or
- Confirming that a technical justification was reviewed and no issue(s) were identified, or
- Confirming that a technical justification was reviewed and any identified issue(s) were noted

Note: Moved part to new Requirement 5

**Each Owner that received a response pursuant to Requirement R4 shall address any identified coordination issue(s) prior to implementing any proposed change(s) or addition(s) to the Protection System(s) associated with the Interconnecting Element(s).**

## **Guidelines and Technical Basis**

This section provides significant insight into the drafting team's logic behind the various Requirements

## **Process Flow Chart**

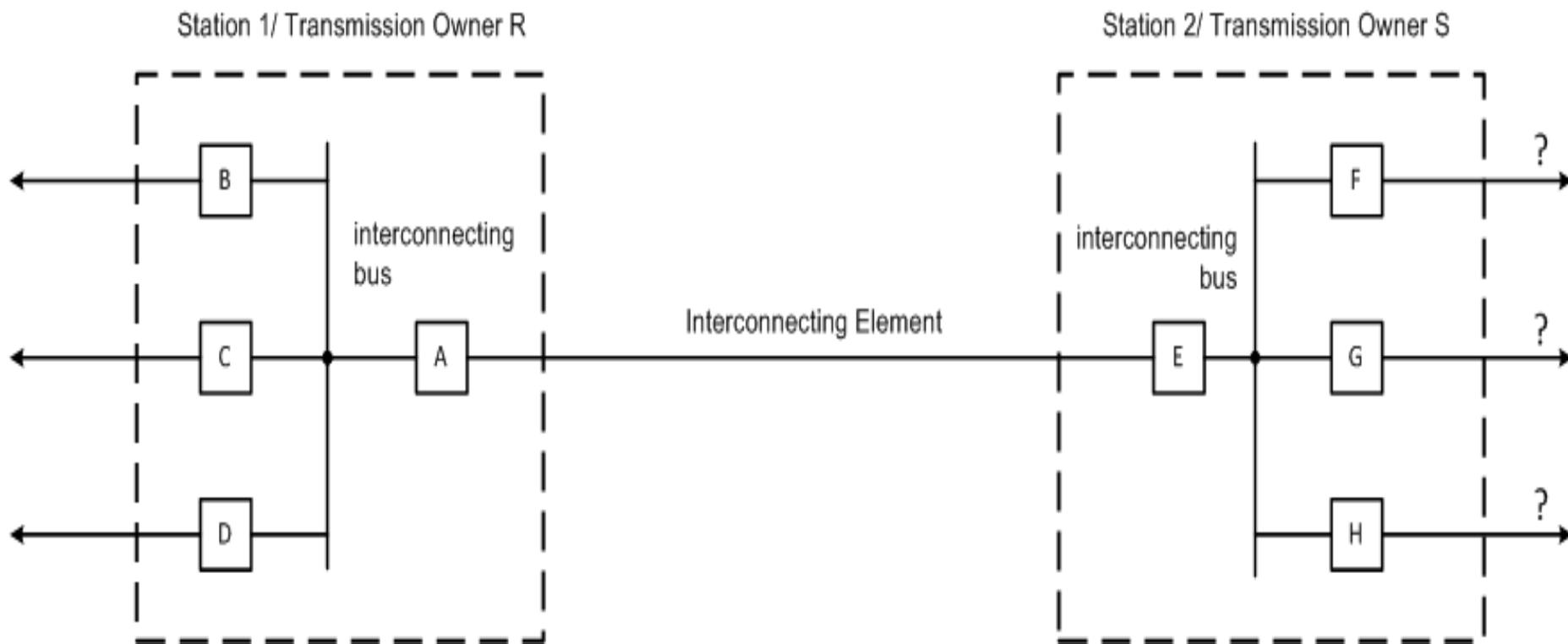
Provides a complete representation of the process, including the relationships between requirements

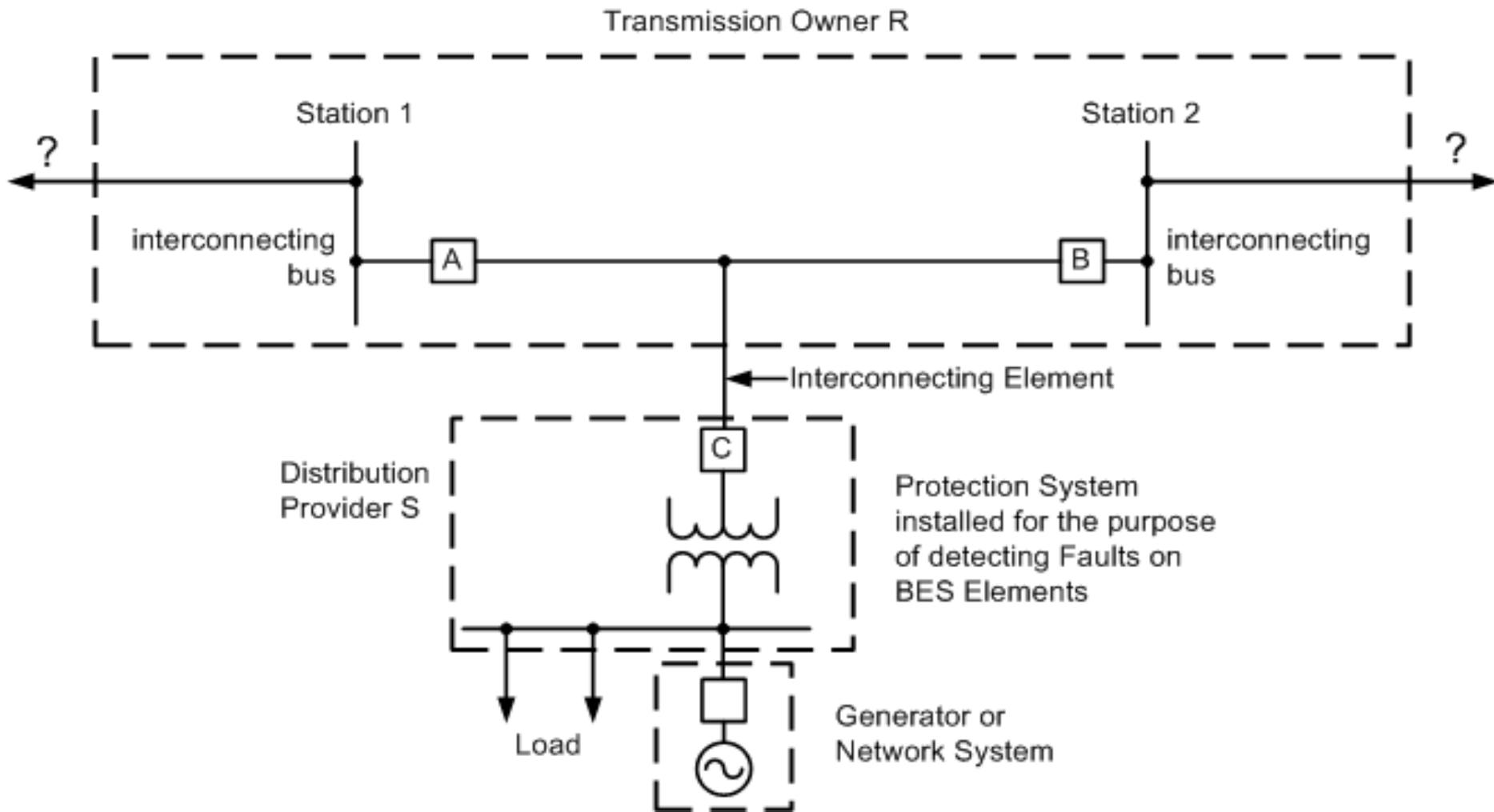
## **Example Process**

Provides an example of the interaction between entities required to gather the information to perform an accurate study is provided below

## **Diagrams**

Provide guidance, to the owners of Facilities associated with the affected Interconnected Element, for meeting the requirements of this standard







# Questions and Answers

- Please contact Al McMeekin at [al.mcmeekin@nerc.net](mailto:al.mcmeekin@nerc.net) or by telephone at (803) 530-1963 to be added to the email distribution list
- Project 2007-06 website <http://www.nerc.com/pa/Stand/Pages/Project-2007-06-System-Protection-Coordination.aspx>
- Timeline
  - 45-Day Formal Comment Period: November 4, 2013 – December 18, 2013
  - Ballot Period: December 9-18, 2013



**Thank you!**