

**Note: an Interpretation cannot be used to change a standard.**

Request for an Interpretation of a Reliability Standard	
<b>Date submitted:</b> <a href="#">March 25, 2009</a>	
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<b>Identify the standard that needs clarification:</b>	
<b>Standard Number (include version number):</b> <a href="#">PRC-004-1 and PRC-005-1</a>	
<b>Standard Title:</b> <a href="#">Analysis &amp; Mitigation of Transmission/Generation Protection System Misoperations; Transmission &amp; Generation Protection System Maintenance &amp; Testing</a>	
<b>Identify specifically what needs clarification</b>	
<b>Requirement Number and Text of Requirement:</b>	
<b>In Standard <a href="#">PRC-004-1</a>:</b>	
<p><b>R1.</b> The Transmission Owner and any Distribution Provider that owns a transmission Protection System shall each analyze its transmission Protection System Misoperations and shall develop and implement a Corrective Action Plan to avoid future Misoperations of a similar nature according to the Regional Reliability Organization's procedures developed for Reliability Standard PRC-003 Requirement 1.</p> <p><b>R3.</b> The Transmission Owner, any Distribution Provider that owns a transmission Protection System, and the Generator Owner shall each provide to its Regional Reliability Organization, documentation of its Misoperations analyses and Corrective Action Plans according to the Regional Reliability Organization's procedures developed for PRC-003 R1.</p>	
<b>In Standard <a href="#">PRC-005-1</a>:</b>	
<p><b>R1.</b> Each Transmission Owner and any Distribution Provider that owns a transmission Protection System and each Generator Owner that owns a generation Protection System shall have a Protection System maintenance and testing program for Protection Systems that affect the reliability of the BES. The program shall include:</p> <p><b>R1.1.</b> Maintenance and testing intervals and their basis.</p>	

**R1.2.** Summary of maintenance and testing procedures.

**R2.** Each Transmission Owner and any Distribution Provider that owns a transmission Protection System and each Generator Owner that owns a generation Protection System shall provide documentation of its Protection System maintenance and testing program and the implementation of that program to its Regional Reliability Organization on request (within 30 calendar days). The documentation of the program implementation shall include:

**R2.1.** Evidence Protection System devices were maintained and tested within the defined intervals.

**R2.2.** Date each Protection System device was last tested/maintained.

**Clarification needed:**

Y-W Electric Association, Inc. (Y-WEA) and Tri-State Generation and Transmission Association, Inc. (Tri-State) respectfully request an interpretation of the term "transmission Protection System" and specifically whether protection for a radially-connected transformer protection system energized from the BES is considered a transmission Protection System and is subject to these standards.

**Background:**

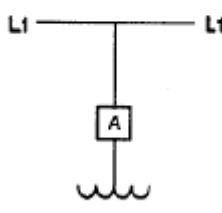
The requirements above from PRC-004-1 and PRC-005-1 refer to "the Transmission Owner and any Distribution Provider that owns a transmission Protection System" and place various testing and reporting requirements on these entities. The term "Protection System" is defined in the NERC glossary, and other interpretation requests currently under consideration cover the fine details of what this term means. However, these standards narrow the scope of their applicability to "transmission" Protection Systems. Unfortunately, this narrowing causes much confusion as to the applicability of these standards because the entire term "Transmission Protection System" is not defined anywhere in NERC's documentation.

There is some debate as to what constitutes a transmission Protection System, versus any other Protection System. For example, consider a tap from a looped 115 kV transmission system where this tap consists of a step-down power transformer and its associated distribution system. The Protection System includes the transformer protection equipment (overcurrent and differential relaying with a circuit switcher) and the associated distribution system protection equipment (usually reclosers). For this example, all connected distribution facilities are designed to be radial in nature and are normally operated radially, with only the possibility of being briefly connected in parallel with other distribution facilities during switching to feed this load from another substation while this substation is taken out of service.

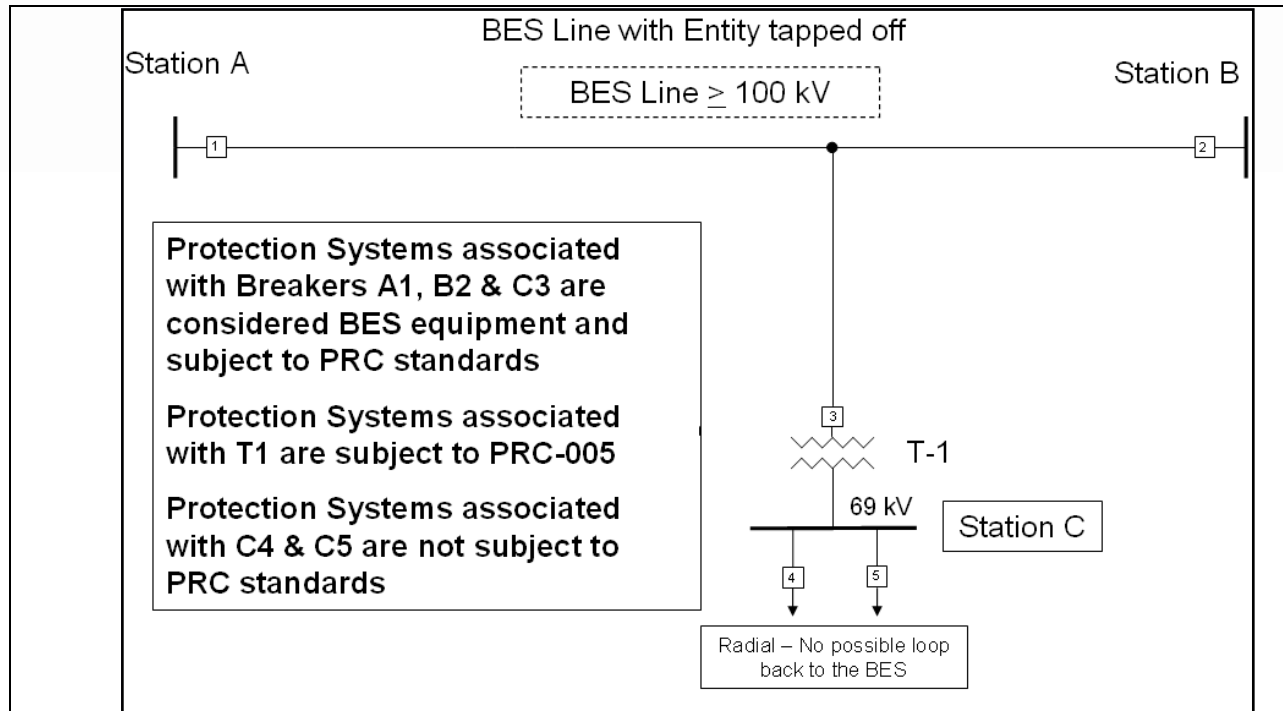
In this example, the looped 115 kV transmission system may be part of the Bulk Electric System and its protective relays and breakers located at the endpoints of this line section would be considered transmission Protection Systems and be subject to these standards. The status of the transformer protection equipment is unclear, though. The protective relays and the circuit switcher are connected at or attached to equipment that is connected at 115 kV, but this equipment is essentially connected to the BES radially, serves radial load, and is not necessarily designed to protect the transmission system to which it is connected. In fact, in many cases this equipment is designed strictly to protect the transformer from overloads and through-faults relating to the connected distribution system as well as to minimize

transformer damage resulting from internal faults by rapidly de-energizing the transformer for such internal faults.

There is a lack of consistent application or interpretation of these rules between various Regional Entities. For instance, ReliabilityFirst Corporation's Appendix A to their Bulk Electric System Definition shown below (available at <http://www.rfirst.org/Documents/AboutUs/Members/RFC%20BES%20Definition.pdf>) directly addresses this question, indicating that the transformer protection equipment in the above example would not be considered a transmission Protection System.

ReliabilityFirst Corp.	Bulk Electric System Definition
<p><b>Example 1B:</b> In another example, if a 138/12.47 kV distribution transformer is tapped from a networked 138 kV line which is included in the BES, and that transformer has protective relays (such as differential relays) that trip <u>only</u> the distribution transformer out-of-service and do not trip the networked 138 kV line; then those protective relays are <u>not included</u> as part of the BES definition. Breaker failure relaying on Breaker A, if any, is included if operation results in tripping of the networked 138kV line (Reference Diagram 1B.)</p>	
	
<p>Diagram 1B</p> <p>Relays protecting non-BES facility (e.g. transformer with secondary windings less than 100 kV) and tripping Breaker A are <u>not included</u> as part of BES.</p>	

However, slide 42 of Western Electricity Coordinating Council's PowerPoint presentation from their August 12, 2008 Relay Workshop (available at <http://www.wecc.biz/documents/library/compliance/2008/2008%2008%2012%20-%20Relay%20Workshop%20-%20Portland,%20OR%20-%20Presentation.ppt>) and shown below, also directly addresses this question, indicating that the equipment in the example above would be considered a transmission Protection System and would be subject to PRC-004-1 and PRC-005-1.



These issues stem from the fact that the term "transmission Protection System" is not clearly defined.

**Identify the material impact associated with this interpretation:**

**Identify the material impact to your organization or others caused by the lack of clarity or an incorrect interpretation of this standard.**

Depending upon the interpreted definition of the term "transmission Protection System," Y-WEA and other Tri-State members who are Distribution Providers and own substations connecting to the BES for power delivery from a wholesale provider as well as Tri-State and other Transmission Owners could be directly and materially affected by these standards. Y-WEA and other Tri-State members are compliant with these NERC standards. We believe the applicability of WECC's more stringent interpretation must be clarified for uniform enforcement.

Alleged violations from a WECC audit where these standards were not thought to be applicable could result in sanctions and civil penalties.

**Project 2009-17: Response to Request for an Interpretation of PRC-004-1 and PRC-005-1 for Y-W Electric Association, Inc. and Tri-State Generation and Transmission Association, Inc.**

The following interpretation of PRC-004-1 — Analysis & Mitigation of Transmission and Generation Protection System Misoperations Requirements R1 and R3 and PRC-005-1 – Transmission and Generation Protection System Maintenance and Testing Requirements R1 and R2 was developed by the System Protection and Controls Subcommittee.

**Requirement Number and Text of Requirement**

**PRC-004-1:**

**R1.** The Transmission Owner and any Distribution Provider that owns a transmission Protection System shall each analyze its transmission Protection System Misoperations and shall develop and implement a Corrective Action Plan to avoid future Misoperations of a similar nature according to the Regional Reliability Organization's procedures developed for Reliability Standard PRC-003 Requirement 1.

**R3.** The Transmission Owner, any Distribution Provider that owns a transmission Protection System, and the Generator Owner shall each provide to its Regional Reliability Organization, documentation of its Misoperations analyses and Corrective Action Plans according to the Regional Reliability Organization's procedures developed for PRC-003 R1.

**PRC-005-1:**

**R1.** Each Transmission Owner and any Distribution Provider that owns a transmission Protection System and each Generator Owner that owns a generation Protection System shall have a Protection System maintenance and testing program for Protection Systems that affect the reliability of the BES. The program shall include:

**R1.1.** Maintenance and testing intervals and their basis.

**R1.2.** Summary of maintenance and testing procedures.

**R2.** Each Transmission Owner and any Distribution Provider that owns a transmission Protection System and each Generator Owner that owns a generation Protection System shall provide documentation of its Protection System maintenance and testing program and the implementation of that program to its Regional Reliability Organization on request (within 30 calendar days). The documentation of the program implementation shall include:

**R2.1.** Evidence Protection System devices were maintained and tested within the defined intervals.

**R2.2.** Date each Protection System device was last tested/maintained.

**Question**

Y-W Electric Association, Inc. (Y-WEA) and Tri-State Generation and Transmission Association, Inc. (Tri-State) respectfully request an interpretation of the term "transmission

Protection System" and specifically whether protection for a radially-connected transformer protection system energized from the BES is considered a transmission Protection System and is subject to these standards.

## Response

The request for interpretation of PRC-004-1 Requirements R1 and R3 and PRC-005-1 Requirements R1 and R2 focuses on the applicability of the term "transmission Protection System." The NERC *Glossary of Terms Used in Reliability Standards* contains a definition of "Protection System" but does not contain a definition of transmission Protection System. In these two standards, use of the phrase transmission Protection System indicates that the requirements using this phrase are applicable to any Protection System that is installed for the purpose of detecting faults on transmission elements (lines, buses, transformers, etc.) identified as being included in the Bulk Electric System (BES) and trips an interrupting device that interrupts current supplied directly from the BES.

A Protection System for a radially connected transformer energized from the BES would be considered a transmission Protection System and subject to these standards only if the protection trips an interrupting device that interrupts current supplied directly from the BES and the transformer is a BES element.