

## Mapping Document

### Project 2010-05.1 Protection Systems: Phase 1 (Misoperations)

## ~~Mapping Document~~

Mapping Document Showing Translation of PRC-003-1 – Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems, and PRC-004-2a – Analysis and Mitigation of Transmission and Generation Protection System Misoperations into PRC-004-3 – Protection System Misoperation Identification and Correction.

#### Standard: PRC-003-1 - Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems

Requirement in Approved Standard	Translation to New Standard or Other Action	Proposed Language in PRC-004-3 – Protection System Misoperation Identification and Correction Or Comment
<p><b>R1.</b> Each Regional Reliability Organization shall establish, document and maintain its procedures for, review, analysis, reporting and mitigation of transmission and generation Protection System Misoperations. These procedures shall include the following elements:</p>	<p>PRC-004-3 Applicability Section 4.1 Functional Entities - assigns the Transmission Owner, Generator Owner, and Distribution Provider as the responsible entity(s) replacing the Regional Reliability Organization. PRC-004-3 replaces the RRO procedures.</p>	<p><b>4.1. Functional Entities:</b></p> <p><b>4.1.1</b> Transmission Owner</p> <p><b>4.1.2</b> Generator Owner</p> <p><b>4.1.3</b> Distribution Provider</p>

Standard: PRC-003-1 - Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems		
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<p><b>R1. Part 1.1.</b> The Protection Systems to be reviewed and analyzed for Misoperations (due to their potential impact on BES reliability).</p>	<p>PRC-004-3 Applicability Section 4.2 Facilities.</p>	<p><b>4.2. Facilities</b>  <b>4.2.1</b> Protection Systems for <u>BES</u> Facilities  <b>4.2.2</b> <u>Underfrequency Load Shedding (UFLS)</u> that <del>are part of the trips a</del> <u>BES Element</u>  <del>4.2.2—Facilities not included</del>  <del>4.2.2.1</del> Special Protection Systems (SPS) <del>or</del> Remedial Action Schemes (RAS)  <del>4.2.2.2</del>, and <u>Undervoltage Load Shedding (UVLS)</u> <u>are excluded</u>  <del>4.2.3—Relay functions not included (these are non</del><b>4.2.4</b>  <u>Non</u>-protective functions that may be imbedded within a Protection System)  <del>4.2.3.1</del>Control (e.g. controlled shut down of generators or capacitor bank switching. Also see Guidelines and Technical Basis section for detailed examples)  <del>4.2.3.2</del>Automation (e.g. data collection) <u>are excluded</u></p>
<p><b>R1. Part 1.2.</b> Data reporting requirements (periodicity and format) for Misoperations.</p>	<p><del>PRC-004-3</del>  <u>Compliance</u>NERC Rules of <u>Procedure</u>, Section <del>C-1.4</del>  <u>Additional Compliance</u></p>	<p><del>C-1.4—Additional Compliance Information</del>  Each Transmission Owner, Generator Owner, and Distribution Provider that owns BES protection Systems will submit the data identified in PRC-004—Attachment 1</p>

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	<del>Information 1600 data request</del>	<del>to the CEA within two calendar months following the end of each calendar quarter. The CEA will report the Misoperation information provided by the responsible entities to NERC on a quarterly basis. N/A</del>
<b>R1. Part 1.3.</b> Process for review, analysis follow up, and documentation of Corrective Action Plans for Misoperations.	PRC-004-3 Requirement R1 Requirement R2 Requirement R3 Requirement R4	<p><b>R1.</b> <u>Each Transmission Owner, Generator Owner, and Distribution Provider shall:</u></p> <p>Within 120 calendar days of <del>ana BES</del> interrupting device operation in its Facility caused by a Protection System operation, <del>each Transmission Owner, Generator Owner, and Distribution Provider shall:</del></p> <p><b>1.1</b> <u>Identify</u> and review each Protection System operation.</p> <ul style="list-style-type: none"> <li><u>If the entity <del>suspects a</del>owns both the BES interrupting device and the Protection System, determine if it was a correct operation or a Misoperation</u></li> <li><u>If the entity owns the BES interrupting device but does not own all of the Protection System and cannot determine that the Protection System operation was correct, then notify the other</u></li> </ul>

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		<p><del>owner(s) of the</del> Protection System component(s) <del>owned by another entity contributed to a</del> Misoperation, <del>notify the owner of that Protection System component</del> and provide any requested investigative information.</p> <p><del>1.2 – Designate each Misoperation (if any).</del></p> <p><del>1.3 Investigate each</del> <u>The Protection System component owner(s) that was notified by the BES interrupting device owner shall determine if there was a correct operation or a Misoperation of their component.</u></p> <p><del>1.2</del> <u>Within the same 120 day period of a BES interrupting device operation caused by a Protection System operation, the owner of the Protection System component identified as contributing to the Misoperation (if any) shall investigate and document the findings including a cause for each Misoperation including a cause, if identified.</u></p> <p><del>R2. Within 60 calendar days of identifying the cause(s) of each Misoperation, the</del> <u>Each</u> Transmission Owner, Generator Owner, or Distribution Provider shall, <u>within 60 calendar days of identifying the cause of each Misoperation:</u></p>

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		<ul style="list-style-type: none"> <li>Develop <del>and document</del> a Corrective Action Plan (CAP) for the identified Protection System component(s) that includes an evaluation of the CAP’s applicability to the entity’s Protection Systems at other locations, or</li> <li>Explain in a declaration why corrective actions are beyond the entity’s control or would reduce BES reliability.</li> </ul> <p><b>R3.</b> <del>For each Misoperation without an identified cause(s), the</del> <u>Each</u> Transmission Owner, Generator Owner, or Distribution Provider shall, within 180 calendar days of <del>its</del><u>the</u> associated <u>BES</u> interrupting device operation, complete <u>for each Misoperation without an identified cause</u>:</p> <ul style="list-style-type: none"> <li>Development of an action plan that identifies any additional investigative actions and/or Protection System modifications, including a work timetable, or</li> <li>A declaration explaining why no further actions will be taken.</li> </ul> <p><b>R4.</b> <del>For each CAP or action plan, the</del> <u>Each</u> Transmission</p>

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		<p>Owner, Generator Owner, or Distribution Provider shall:</p> <p><del>4.1 Implement the CAP or action plan</del></p> <p><del>4.2 Maintain detailed implementation records of implement each CAP or action plan including dated information surrounding any revision(s), and revise as needed through completion.</del></p>
<p><b>R1. Part 1.4.</b> Identification of the Regional Reliability Organization group responsible for the procedures and the process for approval of the procedures.</p>	<p>PRC-004-3                      Applicability Section 4.1                      Functional Entities - assigns the Transmission Owner, Generator Owner, and Distribution Provider as the responsible entity(s) replacing the Regional Reliability Organization.                      PRC-004-3 replaces the RRO procedures.</p>	<p><b>4.1. Functional Entities:</b></p> <p><b>4.1.1</b> Transmission Owner</p> <p><b>4.1.2</b> Generator Owner</p> <p><b>4.1.3</b> Distribution Provider</p>
<p><b>R2.</b> Each Regional Reliability Organization shall maintain and periodically update documentation of its procedures for</p>	<p>PRC-004-3                      Applicability Section 4.1                      Functional Entities - assigns</p>	<p>PRC-004-3 is a results-based standard that achieves the reliability objectives of PRC-003-1. The requirements in the standard define the process for the responsible</p>

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review, analysis, reporting, and mitigation of transmission and generation Protection System Misoperations.	the Transmission Owner, Generator Owner, and Distribution Provider as the responsible entity(s) replacing the Regional Reliability Organization. PRC-004-3 replaces the RRO procedures.	entities to follow. The standards development process mandates the standards be reviewed once every five years.  <b>4.1. Functional Entities:</b> <b>4.1.1</b> Transmission Owner <b>4.1.2</b> Generator Owner <b>4.1.3</b> Distribution Provider  See <b>PRC-004-3</b>
<b>R3.</b> Each Regional Reliability Organization shall distribute procedures in Requirement 1 and any changes to those procedures, to the affected Transmission Owners, Distribution Providers that own transmission Protection Systems, and Generator Owners within 30 calendar days of approval of those procedures.	PRC-004-3 Applicability Section 4.1 Functional Entities - assigns the Transmission Owner, Generator Owner, and Distribution Provider as the responsible entity(s) replacing the Regional Reliability Organization. PRC-004-3 replaces the RRO procedures.	PRC-004-3 is a results-based standard that achieves the reliability objectives of PRC-003-1. The requirements in the standard define the process for the responsible entities to follow.  <b>4.1. Functional Entities:</b> <b>4.1.1</b> Transmission Owner <b>4.1.2</b> Generator Owner <b>4.1.3</b> Distribution Provider  See <b>PRC-004-3</b>



Standard: PRC-004-2a - Analysis and Mitigation of Transmission and Generation Protection System Misoperations		
Requirement in Approved Standard	Translation to New Standard or Other Action	Proposed Language in PRC-004-3 – Protection System Misoperation Identification and Correction or Comment
<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 Entity’s procedures.</p>	<p>PRC-004-3 Requirement R1 Requirement R2 Requirement R3 Requirement R4</p>	<p><b>R1.</b>– <u>Each Transmission Owner, Generator Owner, and Distribution Provider shall:</u>            Within 120 calendar days of <del>an</del> a BES interrupting device operation in its Facility caused by a Protection System operation, <del>each Transmission Owner, Generator Owner, and Distribution Provider shall:</del>  <u>1.1 1.1 Identify</u> identify and review each Protection System operation.</p> <ul style="list-style-type: none"> <li>• <u>If the entity <del>suspects</del> owns both the BES interrupting device and the Protection System, determine if it was a correct operation or a Misoperation</u></li> <li>• <u>If the entity owns the BES interrupting device but does not own all of the Protection System and cannot determine that the Protection System operation was correct, then notify the other owner(s) of the Protection System component(s) <del>owned by another entity contributed to a Misoperation, notify the owner of that Protection System component</del> and provide any requested investigative information.</u></li> </ul>

Standard: PRC-004-2a - Analysis and Mitigation of Transmission and Generation Protection System Misoperations		
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		<p><del>1.2 Designate each Misoperation (if any).</del></p> <p><del>1.3 Investigate each</del> <u>The Protection System component owner(s) that was notified by the BES interrupting device owner shall determine if there was a correct operation or a Misoperation of their component.</u></p> <p><u>1.2 Within the same 120 day period of a BES interrupting device operation caused by a Protection System operation, the owner of the Protection System component identified as contributing to the Misoperation (if any) shall investigate and document the findings including a cause for each Misoperation including a cause, if identified.</u></p> <p><del>R2. Within 60 calendar days of identifying the cause(s) of each Misoperation, the</del> <u>Each</u> Transmission Owner, Generator Owner, or Distribution Provider shall, <u>within 60 calendar days of identifying the cause of each Misoperation:</u></p> <ul style="list-style-type: none"> <li>Develop a Corrective Action Plan (CAP) for the identified Protection System component(s) that</li> </ul>

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		<p>includes an evaluation of the CAP’s applicability to the entity’s Protection Systems at other locations, or</p> <ul style="list-style-type: none"> <li>Explain in a declaration why corrective actions are beyond the entity’s control or would reduce BES reliability.</li> </ul> <p><b>R3.</b> <del>For each Misoperation without an identified cause(s), the</del><u>Each</u> Transmission Owner, Generator Owner, or Distribution Provider shall, within 180 calendar days of <del>it</del><u>the</u> associated <u>BES</u> interrupting device operation, complete <u>for each Misoperation without an identified cause</u>:</p> <ul style="list-style-type: none"> <li>Development of an action plan that identifies any additional investigative actions and/or Protection System modifications, including a work timetable, or</li> <li>A declaration explaining why no further actions will be taken.</li> </ul> <p><b>R4.</b> <del>For each CAP or action plan, the</del><u>Each</u> Transmission Owner, Generator Owner, or Distribution Provider</p>

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		<p>shall:</p> <p><del>4.1 Implement the CAP or action plan</del></p> <p><del>4.2 Maintain detailed implementation records of implement each CAP or action plan including dated information surrounding any revision(s), and revise as needed through completion.</del></p>
<p><b>R2.</b> The Generator Owner shall analyze its generator Protection System Misoperations, and shall develop and implement a Corrective Action Plan to avoid future Misoperations of a similar nature according to the Regional Entity’s procedures.</p>	<p>PRC-004-3 Requirement R1 Requirement R2 Requirement R3 Requirement R4</p>	<p><b>R1.</b> <u>Each Transmission Owner, Generator Owner, and Distribution Provider shall:</u></p> <p>Within 120 calendar days of <del>an</del> a BES interrupting device operation in its Facility caused by a Protection System operation, <del>each Transmission Owner, Generator Owner, and Distribution Provider shall:</del></p> <p><del>1.1 1.1 Identify</del> <u>identify</u> and review each Protection System operation.</p> <ul style="list-style-type: none"> <li><u>If the entity <del>suspects</del> owns both the BES interrupting device and the Protection System, determine if it was a correct operation or a Misoperation</u></li> <li><u>If the entity owns the BES interrupting device but does not own all of the Protection System</u></li> </ul>

Standard: PRC-004-2a - Analysis and Mitigation of Transmission and Generation Protection System Misoperations

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		<p><u>and cannot determine that the Protection System operation was correct, then notify the other owner(s) of the Protection System component(s) <del>owned by another entity contributed to a Misoperation, notify the owner of that Protection System component</del> and provide any requested investigative information.</u></p> <p><del>1.2 Designate each Misoperation (if any).</del></p> <p><del>1.3 Investigate each</del> <u>The Protection System component owner(s) that was notified by the BES interrupting device owner shall determine if there was a correct operation or a Misoperation of their component.</u></p> <p><u>1.2 Within the same 120 day period of a BES interrupting device operation caused by a Protection System operation, the owner of the Protection System component identified as contributing to the Misoperation (if any) shall investigate and document the findings including a cause for each Misoperation including a cause, if identified.</u></p>

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		<p><b>R2.</b> <del>Within 60 calendar days of identifying the cause(s) of each Misoperation, the</del> <u>Each</u> Transmission Owner, Generator Owner, or Distribution Provider shall, <u>within 60 calendar days of identifying the cause of each Misoperation:</u></p> <ul style="list-style-type: none"> <li>• Develop a Corrective Action Plan (CAP) for the identified Protection System component(s) that includes an evaluation of the CAP’s applicability to the entity’s Protection Systems at other locations, or</li> <li>• Explain in a declaration why corrective actions are beyond the entity’s control or would reduce BES reliability.</li> </ul> <p><b>R3.</b> <del>For each Misoperation without an identified cause(s), the</del> <u>Each</u> Transmission Owner, Generator Owner, or Distribution Provider shall, within 180 calendar days of its associated interrupting device operation, complete <u>for each Misoperation without an identified cause:</u></p> <ul style="list-style-type: none"> <li>• Development of an action plan that identifies</li> </ul>

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		<p>any additional investigative actions and/or Protection System modifications, including a work timetable, or</p> <ul style="list-style-type: none"> <li>A declaration explaining why no further actions will be taken.</li> </ul> <p><b>R4.</b> <del>For each CAP or action plan, the</del><u>Each</u> Transmission Owner, Generator Owner, or Distribution Provider shall:</p> <p><del>4.1 Implement the CAP or action plan</del></p> <p><del>4.2 Maintain detailed implementation records of</del> <u>implement</u> each CAP or action plan <del>including dated information surrounding any revision(s),</del> and <u>revise as needed through</u> completion.</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 Entity, documentation of its Misoperations analyses and Corrective Action Plans according to the Regional</p>	<p>PRC-004-3 Requirement 4</p> <p><del>Compliance</del><u>NERC Rules of Procedure, Section C-1.4 Additional Compliance Information</u><u>1600 data request</u></p>	<p><b>R4.</b> <del>For each CAP or action plan, the</del><u>Each</u> Transmission Owner, Generator Owner, or Distribution Provider shall:</p> <p><del>4.1 Implement the CAP or action plan</del></p> <p><del>4.2 Maintain detailed implementation records of</del> <u>implement</u> each CAP or action plan <del>including dated information surrounding any revision(s),</del> and <u>revise</u></p>

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Entity's procedures.		<p><u>as needed through</u> completion.</p> <p><del><b>C.1.4. Additional Compliance Information</b></del>  <del>Each Transmission Owner, Generator Owner, and Distribution Provider that owns BES protection Systems will submit the data identified in PRC-004 Attachment 1 to the CEA within two calendar months following the end of each calendar quarter.</del>  <del>The CEA will report the Misoperation information provided by the responsible entities to NERC on a quarterly basis.</del></p> <p><u>N/A</u></p>