

## Project 2007-06 System Protection Coordination Mapping Document

Mapping Document Showing Translation of PRC-001-2 – System Protection Coordination to PRC-027-1 – Protection System Coordination for Performance During Faults  
Updated 10-31 to reflect changes made to requirements

Standard: PRC-001-2 - System Protection Coordination		
Requirement in Approved Standard	Translation to New Standard or Other Action	Proposed Language or Comment in PRC-027-1
<b>R1.</b> Each Transmission Operator, Balancing Authority, and Generator Operator shall be familiar with the purpose and limitations of protection system schemes applied in its area.	Retained	NA
<p><b>R2.</b> A Generator Operator or Transmission Operator shall coordinate new protective systems and changes as follows.</p> <p><b>R2.1</b> Each Generator Operator shall coordinate all new protective systems and all protective system changes with its Transmission Operator and Host Balancing Authority.</p>	<p>PRC-027-1, R1, R3, &amp; R4</p> <p>Note: Applicability changed to GO, TO and DP</p>	<p><b>R1.</b> Each Transmission Owner, Generator Owner, and Distribution Provider shall:</p> <p><b>1.1.</b> Perform a Protection System Study for each Interconnected Element on its System as follows:</p> <p><b>1.1.3.</b> 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 Part 3.3, or technically justify why such a study is not required.</p>

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<p><b>R2.2</b> Each Transmission Operator shall coordinate all new protective systems and all protective system changes with neighboring Transmission Operators and Balancing Authorities.</p>		<p><b>1.2.</b> Within 90 calendar days after the completion of each Protection System Study provide to the owner(s) of the Protection System(s) associated with the Interconnected Element(s) a summary of the results of each Protection System Study performed pursuant to this requirement, (including, at a minimum, the protective relay settings reviewed, power system Elements to be isolated, contingencies evaluated, Fault currents used, any issues identified, and any revisions proposed).</p> <p><b>R3.</b> Each Transmission Owner, Generator Owner, and Distribution Provider shall provide to each Transmission Owner, Generator Owner, and Distribution Provider connected to the same Interconnected Element:</p> <p><b>3.1.</b> Details for any change or additions listed below; either at an existing or new Facility associated with the Interconnected Element; or at other facilities when the proposed change modifies the conditions used in the coordination of Protection Systems associated with the Interconnected Element(s).</p> <ul style="list-style-type: none"> <li>• New installation, replacement with different types, or modification of: protective relays or protective function settings, communication systems, current transformer ratios and voltage transformer ratios</li> <li>• Changes to a transmission system Element that change any sequence or mutual coupling impedance</li> <li>• Changes to generator unit(s) that result in a change in impedance</li> </ul>

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		<ul style="list-style-type: none"> <li>Changes to the generator step-up transformer(s) that result in a change in impedance</li> </ul> <p><b>3.2.</b> Requested information related to the coordination of Protection Systems associated with an Interconnected Element within 30 calendar days of receiving a request or according to an agreed-upon schedule.</p> <p><b>3.3.</b> Within 30 calendar days, details of changes made to Protection Systems during Misoperation investigations, commissioning, maintenance activities, or emergency replacements made due to failures of Protection System components.</p> <p><b>R4.</b> Each Transmission Owner, Generator Owner, and Distribution Provider shall:</p> <p><b>4.2.</b> Prior to implementing any planned change(s) associated with Requirement R3, Part 3.1, confirm the owner(s) of each Facility associated with the affected Interconnected Element accept any resulting Protection System(s) changes.</p>
<p><b>R3.</b> Each Transmission Operator shall coordinate protection systems on major transmission lines and interconnections with neighboring Generator Operators, Transmission Operators, and Balancing</p>	<p>PRC-027-1, R1, R2, R3, &amp; R4</p> <p>Note: Applicability</p>	<p><b>R1.</b> Each Transmission Owner, Generator Owner, and Distribution Provider shall:</p> <p><b>1.1.</b> Perform a Protection System Study for each Interconnected Element on its System as follows:</p> <p><b>1.1.1.</b> Within 48 calendar months after the effective date of this standard, if no Protection System Study for that Interconnected</p>

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Authorities.	changed to GO, TO and DP	<p>Element exists.</p> <p><b>1.1.2.</b> Within six 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.</p> <p><b>1.2.</b> Within 90 calendar days after the completion of each Protection System Study provide to the owner(s) of the Protection System(s) associated with the Interconnected Element(s) a summary of the results of each Protection System Study performed pursuant to this requirement, (including, at a minimum, the protective relay settings reviewed, power system Elements to be isolated, contingencies evaluated, Fault currents used, any issues identified, and any revisions proposed).</p> <p><b>R2.</b> For each Facility associated with an Interconnected Element on its System, the Transmission Owner shall:</p> <p><b>2.1.</b> At least once every 24 months:</p> <p><b>2.1.1</b> Perform a short circuit study to determine the present maximum available Fault current values (single line to ground and 3-phase) at the interconnecting bus where a Protection System Study is available per Requirement R1.</p> <p><b>2.1.2.</b> Calculate the percent deviation between the Fault current values (single line to ground and 3-phase for the interconnecting bus(s) under</p>

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		<p>consideration) used in the most recent Protection System Study and the Fault current values determined pursuant to Requirement R2, Part 2.1.1, using the following equation:</p> $I_{scs} = \frac{I_{pss}}{k}$ <p>Where: <math>I_{scs}</math> = Fault current value from present short-circuit study</p> <p>And: <math>I_{pss}</math> = Fault current value used in the most recent Protection System Study</p> <p><b>2.2.</b> Within 30 calendar days after identification where the calculation performed, pursuant to Requirement R2, Part 2.1.2, indicates a deviation in Fault current of 10% or greater, provide each owner of the Protection System associated with the Interconnected Element the updated Fault current values (<math>I_{scs}</math>).</p> <p><b>R3.</b> Each Transmission Owner, Generator Owner, and Distribution Provider shall provide to each Responsible Entity connected to the same Interconnected Element:</p> <p><b>3.2.</b> Requested information related to the coordination of Protection Systems associated with an Interconnected Element within 30 calendar days of receiving a request or according to an agreed-upon schedule.</p> <p><b>R4.</b> Each Transmission Owner, Generator Owner, and Distribution Provider</p>

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		<p>shall:</p> <p><b>4.1.</b> Within 90 calendar days after receipt, or according to an agreed upon schedule, review the summary results of a Protection System Study, as described in Requirement R1, Part 1.2, and respond as to whether further action is required.</p>