

PRC-001 R6 & R7.3 TFO's Notification Requirement

Diagram Information:

- 4 Substation Buses: SB1 is Substation Bus 1, SB2 is Substation Bus 2, SB3 is Substation Bus 3, and SB4 is Substation Bus 4.
- Terminals: SB1 has 4 terminals, SB2 has 5 terminals, SB3 has 4 terminals, and SB4 has 4 terminals.
- 14 Lines: Line 01-02, Line 03-04, Line 05-06, Line 07-08, Line 09-10, Line 11-12, Line 13-14, Line 15-16, Line 17-18, Line 19-20, Line 21-22, Line 23-24, Line 25-26, and Line 27-28.
- Dashed Lines Indicate New Additions.
- Ownerships are indicated by different line colors.

Definitions of Interconnecting and Non-interconnecting Bus/Element are as follows:

- Interconnecting Bus is defined as: A substation bus with connected terminals which belong to more than one utility. Examples: SB1 and SB2.
- Non-interconnecting Bus is defined as: A substation bus with connected terminals which belong to only one utility. Examples: SB3 and SB4.
- Power System Elements: For simplicity, only elements with 2 terminals are considered. Therefore, only 2-terminal lines are indicated in the diagram.
- Interconnecting Element is defined as: A Power System Element with connected terminals belong to more than one utility. Examples: Line 07-08 and Line 21-22.
- Non-interconnecting Element is defined as: A Power System Element with connected terminals belong to only one utility. Examples: Line 01-02, Line 03-04, Line 05-06, Line 09-10, Line 11-12, Line 13-14, Line 15-16, Line 17-18, Line 19-20, Line 23-24, Line 25-26 and Line 27-28.

The following are six examples to indicate the PRC-001 notification requirement:

<p>For Terminal 05 (Connected to SB1): The Remote Terminal is: 06 The Upstream terminals are: 01, 03 & 23 The Downstream terminals are: 07, 09, 11 & 14 (Note: All four terminals are connected to SB2) The "Same Bus" Adjacent terminals are: 02, 04 & 24 If protection settings are to be changed (or added) at terminal 05: <i>Owners of terminals 03, 11, 14 & 04 are to be notified.</i></p>	<p>For Terminal 06 (Connected to SB2): The Remote Terminal is: 05 The Upstream terminals are: 08, 10, 12 & 13 The Downstream terminals are: 02, 04 & 24 (Note: All three terminals are connected to SB1) The "Same Bus" Adjacent terminals are: 07, 09, 11 & 14 If protection settings are to be changed (or added) at terminal 06: <i>Owners of terminals 08, 12, 13, 04, 11 & 14 are to be notified.</i></p>
<p>For Terminal 09 (Connected to SB2): The Remote Terminal is: 10 The Upstream terminals are: 08, 05, 12 & 13 The Downstream terminals are: 15, 17 & 25 (Note: All three terminals are connected to SB3) The "Same Bus" Adjacent terminals are: 06, 07, 11 & 14 If protection settings are to be changed (or added) at terminal 09: <i>Owners of terminals 08, 12, 13, 11 & 14 are to be notified.</i></p>	<p>For Terminal 10 (Connected to SB3): The Remote Terminal is: 09 The Upstream terminals are: 16, 18, & 26 The Downstream terminals are: 07, 06, 11 & 14 (Note: All four terminals are connected to SB2) The "Same Bus" Adjacent terminals are: 15, 17 & 25 If protection settings are to be changed (or added) at terminal 10: <i>Owners of terminals 11 & 14 are to be notified.</i></p>
<p>For Terminal 17 (Connected to SB3): The Remote Terminal is: 18 The Upstream terminals are: 09, 16, & 26 The Downstream terminals are: 19, 21 & 27 (Note: All three terminals are connected to SB4) The "Same Bus" Adjacent terminals are: 10, 15 & 25 If protection settings are to be changed (or added) at terminal 17: <i>No notification is required.</i></p>	<p>For Terminal 18 (Connected to SB4): The Remote Terminal is: 17 The Upstream terminals are: 20, 22 & 28 The Downstream terminals are: 15, 10 & 25 (Note: All three terminals are connected to SB3) The "Same Bus" Adjacent terminals are: 19, 21 & 27 If protection settings are to be changed (or added) at terminal 18: <i>Owner of terminal 22 is to be notified.</i></p>

In addition to the above listed notification requirement: If protection settings are to be changed at a terminal of an Interconnecting Element (i.e. Line), the owner of the other terminal (of the same Interconnecting Line) is to be notified.

If protection settings are to be changed (or added) at terminal 07: <i>Owner of terminal 08 is to be notified.</i>	If protection settings are to be changed (or added) at terminal 21: <i>Owner of terminal 22 is to be notified.</i>
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Since the above listed notification requirements refer to line protections, further clarifications are provided as follows:

The interconnected party is to be notified of any protection setting change which resulted in any change in any one of the following protection characteristics:

- Impedance protection coverage (i.e. calculated Primary Value) or the associated timing (i.e. time delay),
- Over-current protection coverage (i.e. calculated Primary Value) or the associated timing (i.e. time delay).

Differential protection is a Unit-Protection which does not require protection coordination with upstream or downstream protections. Therefore, no notification is required for protection setting change in any existing differential protection.

The following situations are provided to illustrate some specific cases of notification requirements:

SCN	Notification Required	SCN	No Notification Required
01	Change in impedance zone reach (i.e. calculated Primary value)	01A	Change in impedance protection setting parameters which does not result in any change in the impedance zone reach (i.e. The calculated Primary value remains the same)
02	Change in impedance zone timer setting		
03	Change in line protection scheme (e.g. Change from PUTT to POTT)		
04	Change in relay device type/make, which changes the protection coverage, protection timing, protection characteristics or protection scheme	04A	Change in relay device type/make without any change to the protection coverage, protection timing, protection characteristics or protection scheme (e.g. Change form Vendor-1 impedance relay to Vendor-2 impedance relay, with no change to the original protection coverage, original protection timing, original protection characteristics or original protection scheme. That means the calculated Primary value remains the same)
05	Change in overcurrent protection primary pickup value	05A	Change in overcurrent protection setting parameters which does not result in any change in the primary overcurrent pickup value (e.g. Change from “tap 8 at 300/5” to tap 4 at 600/5)
06	Change in overcurrent protection timing setting (i.e. time dial, time delay)	06A	
		07A	Setting change related to bus differential protection (e.g. CT ratio change for the bus differential protection, differential slope setting change or differential current pickup value change)
SCN	Notification Required	SCN	No Notification Required
08		08A	Setting change related to transformer differential protection

			(e.g. CT ratio change for the transformer differential protection, differential slope setting change or differential current pickup value change)
		09A	Setting change related to line differential protection (e.g. CT ratio change for the line differential protection, differential slope setting change or differential current pickup value change) Note: For an interconnecting (i.e. jointly owned) line, any setting change related to line differential protection, is expected to be jointly determined by the interconnected utilities. However, this joint effort is outside the scope of PRC-001.
		10A	Addition of a “Partner Protection” to an existing protection, and the newly added protection has the same protection coverage, protection timing, protection characteristics and protection scheme as the existing protection (e.g. Adding a “B-Protection” which has the same protection coverage, protection timing, protection characteristics and protection scheme as the existing “A-Protection)
11	Change in Breaker Failure Protection time delay	11A	Change in Breaker Failure Protection overcurrent pickup value
		12A	Change in event recording settings on the relay
		13A	Change in relay inputs and/or outputs
		14A	Firmware upgrades to relays, which does not result in any change in the protection coverage, protection timing, protection characteristics or protection scheme Note: For an interconnecting (i.e. jointly owned) line with relay-to-relay teleprotection, any firmware upgrade is expected to be jointly determined by the interconnected utilities. However, this joint effort is outside the scope of PRC-001.
		15A	IT (Information Technology) type change or SCADA type change (such as DNP mapping/points change) to existing protection devices, which does not result in any change in the protection coverage, protection timing, protection characteristics or protection scheme (e.g. IP Address correction on existing device, Communication Port change, or Communication Speed/Rate change, which does not impact protection)

SCN	Notification Required	SCN	No Notification Required
		16A	Setting changes in Synch-Check or Synchronizing device
		17A	Setting changes in Auto-Reclosing device (e.g. Settings for various timing or lead/follow logics)
		18A	Setting changes in Transformer Non-electrical protection/alarms (e.g. Transformer Thermal or Pressure Settings)
19	Line rating change of jointly owned (i.e. interconnected) line		
20	Line rating change of solely owned line, which requires the line owner to change the line protection settings	20A	Line rating change of solely owned line, which does not require the line owner to change the line protection settings

(Note: **SCN** = Situation Case Number. Notification is required for **SCN xx**. No notification is required for **SCN xxA**)

Guiding Principles: PRC-001 deals mainly with Protection Coordination. Therefore, if the changes do not impact any Protection Coordination, no notification is required.

PRC-001 R6 and R7.3: Protection Coordination:

Requirement for Notification: Power System Element(s) & Bus(es) Defined

