NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Mapping Document

Project 2008-02.2 Phase 2: Undervoltage Load Shedding

During development of PRC-010-1, the standard drafting team provided the following explanation on its approach to cover Misoperation of UVLS equipment in future work:

> "As PRC-022-1 addresses UVLS equipment Misoperations, the UVLS drafting team's intention is for PRC-004 to address Misoperations of UVLS Program equipment. A change to make PRC-004 explicitly applicable to UVLS Program equipment will be addressed once PRC-004-3 – Protection System Misoperation Identification and Correction[1] is completed under Project 2010-05.1 – Misoperations (Phase 1 of Protection Systems)."

The table below demonstrates how proposed changes map from the retirement of PRC-022-1 (retired by the initial 2008-02 project) to the proposed PRC-010-2. The revisions are being proposed to provide additional clarity with the aligning revisions being proposed in PRC-004-5 as shown in Table 2.

[1] PRC-004-3 was surpassed by version four which addressed applicability to dispersed generation resources under Project 2014-01.

Table 1: Mapping PRC-022-1 to PRC-010-2		
Requirement in Approved PRC-022-1 Reliability Standard	**Translation to New Standard or Other Action**	**Proposed Language in PRC-010-2 or Comments**
R1. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a UVLS program to mitigate the risk of voltage collapse or voltage instability in the BES shall **analyze and document all UVLS operations and Misoperations**. The analysis shall include:* **R1.5** For any Misoperation, a Corrective Action Plan to avoid future Misoperations of a similar nature. *Sub-requirements R1.1 through R1.4 have been omitted because they were addressed in Project 2008-02 during development of PRC-010-1.	PRC-010-2 proposes Part 4.2 to provide additional clarity that UVLS equipment operations and Misoperations are addressed by Requirement R4 through the Planning Coordinator or Transmission Planner assessment. Part 4.1 was originally embedded in the main Requirement R4 of PRC-010-1 and is now shown as a new Part 4.1 now. Part 4.2 is being proposed to provide the necessary clarity that the assessment conducted following an event that resulted in a voltage excursion for which its UVLS Program was designed to operate must include UVLS Program equipment.	**R4.** Each Planning Coordinator or Transmission Planner shall, within 12 calendar months of an event that resulted in a voltage excursion for which its UVLS Program was designed to operate, perform an assessment to evaluate: **4.1.** whether its UVLS Program resolved the undervoltage issues associated with the event, and **(Proposed) 4.2.** the performance (i.e., operation and non-operation) of the UVLS Program equipment.

Table 1: Mapping PRC-022-1 to PRC-010-2		
Requirement in Approved PRC-022-1 Reliability Standard	**Translation to New Standard or Other Action**	**Proposed Language in PRC-010-2 or Comments**
	Part 4.2 requires the Planning Coordinator or Transmission Planner to assess the UVLS equipment performance and address any deficiencies in a Corrective Action Plan (CAP) as required by PRC-010-2, Requirement R5. The clause "in its UVLS Program" was removed to clarify the Corrective Action Plan is addressing components of the assessment, which is about the UVLS Program.	**R5.** Each Planning Coordinator or Transmission Planner that identifies deficiencies during an assessment performed in either Requirement R3 or R4 shall develop a Corrective Action Plan to address the deficiencies and subsequently provide the Corrective Action Plan, including an implementation schedule, to UVLS entities within three calendar months of completing the assessment.

Table 2: Mapping PRC-022-1 to PRC-004-5		
Requirement in Approved PRC-022-1 Reliability Standard	**Translation to New Standard or Other Action**	**Proposed Language in PRC-004-5 or Comments**
R1. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a UVLS program to mitigate the risk of voltage collapse or voltage instability in the BES shall **analyze and document all UVLS operations and Misoperations**. The analysis shall include:* **R1.5** For any Misoperation, a Corrective Action Plan to avoid future Misoperations of a similar nature. *Sub-requirements R1.1 through R1.4 have been omitted because they were addressed in Project 2008-02 during development of PRC-010-1.	The proposed Applicability 4.2.3 addresses the clause "analyze and document all UVLS operations and Misoperations" in PRC-022-1, Requirement R1. The standard PRC-004-5, Requirement R5 requires a Corrective Action Plan (CAP) to be developed for a known cause of a Misoperation and addresses Requirement R1.5. Requirement R6 requires the implementation of the CAP.	**(Proposed) 4.2.3** Undervoltage load shedding (UVLS) that is intended to trip one or more BES Elements. **R5.** Each Transmission Owner, Generator Owner, and Distribution Provider that owns the Protection System component(s) that caused the Misoperation shall, within 60 calendar days of first identifying a cause of the Misoperation: [Violation Risk Factor: Medium] [Time Horizon: Operations Planning, Long-Term Planning] • Develop a Corrective Action Plan (CAP) for the identified Protection System component(s), and an evaluation of the CAP's applicability to the entity's other Protection Systems including other locations; or

Table 2: Mapping PRC-022-1 to PRC-004-5		
Requirement in Approved PRC-022-1 Reliability Standard	**Translation to New Standard or Other Action**	**Proposed Language in PRC-004-5 or Comments**
		• Explain in a declaration why corrective actions are beyond the entity's control or would not improve BES reliability, and that no further corrective actions will be taken. **R6.** Each Transmission Owner, Generator Owner, and Distribution Provider shall implement each CAP developed in Requirement R5, and update each CAP if actions or timetables change, until completed.