

September 19, 2017

VIA ELECTRONIC FILING

David Erickson
President and Chief Executive Officer
Alberta Electric System Operator
2500, 330 - 5 Avenue SW
Calgary, Alberta
T2P 0L4

RE: Errata to Implementation Plan for the Revised Definition of “Remedial Action Scheme”

Dear Mr. Erickson:

The North American Electric Reliability Corporation (“NERC”) hereby submits an errata to the Implementation Plan for the Revised Definition of “Remedial Action Scheme” (the “RAS Implementation Plan”) submitted on February 25, 2015. As explained below, the errata is necessary to incorporate into the RAS Implementation Plan certain necessary implementation provisions from the Implementation Plan associated with Reliability Standard PRC-023-3 (the “PRC-023-3 Implementation Plan”) that were inadvertently omitted from the RAS Implementation Plan.

On February 25, 2015, the North American Electric Reliability Corporation (“NERC”) filed a petition for approval of proposed revisions to the definition of the term “Remedial Action Scheme” (“RAS”) in the *Glossary of Terms Used in NERC Reliability Standards* (“NERC Glossary”) and modifications to specified Reliability Standards to incorporate the revised RAS definition in place of the term Special Protection System. Among others, the PRC-023 Reliability Standard was modified to incorporate the RAS definition, moving from version PRC-023-3 to PRC-023-4. There were no other substantive changes made to the Reliability Standard at that time.

When Reliability Standard PRC-023-3 was developed, the PRC-023-3 Implementation Plan included specific provisions for load-responsive phase protection systems on circuits identified by the Planning Coordinator pursuant to Requirement R6. Specifically, the provision allows each Transmission Owner, Generator Owner, and Distribution Provider to become compliant with in Requirements R1, R2, and R3 for those systems the latter of the first day of the first calendar quarter 39 months following notification by the Planning Coordinator of a circuit’s inclusion on a list of circuits per application of Attachment B, or the first day of the first calendar year in which any criterion in Attachment B applies, unless the Planning Coordinator removes the circuit from the list before the applicable effective date.

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Additionally, the PRC-023-3 Implementation Plan included provisions regarding the retirement of Requirement R1, Criterion 6, contained in PRC-023-2. Specifically, the PRC-023-3 Implementation Plan specified that Requirement R1, Criterion 6 remains in effect through the implementation of Reliability Standard PRC-025-1 as specified in the Implementation Plan associated with PRC-025-1.

Recently, NERC noticed that in developing the RAS Implementation Plan, the provisions from the PRC-023-3 discussed above were inadvertently omitted. Those provisions must be carried forward for the PRC-023-4 version of the Reliability Standard to ensure that (1) entities continue to have the appropriate implementation period for complying with requirements applicable to load-responsive phase protection systems on circuits identified by the Planning Coordinator pursuant to Requirement R6, and (2) Requirement R1, Criterion 6 from PRC-023-2 remains in effect for the appropriate time. As such, NERC revised the RAS Implementation Plan to incorporate by reference the provisions from the PRC-023-3 Implementation Plan. The proposed modifications are identified in the redline version of the revised RAS Implementation Plan, provided as **Exhibit A** hereto. The proposed clean version of the revised RAS Implementation Plan is provided in **Exhibit B**.

Respectfully submitted,

/s/ Shamai Elstein

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Exhibit A

Implementation Plan for the Revised Definition of “Remedial Action Scheme”

Redline Version

Implementation Plan for the Revised Definition of “Remedial Action Scheme”

Project 2010-05.2 – Special Protection Systems

Background

The existing Glossary of Terms Used in NERC Reliability Standards definition for “Special Protection System” (“SPS”) or “Remedial Action Scheme” (“RAS”) lacks the specificity necessary to consistently identify what equipment or protection schemes qualify as SPS/RAS across the eight NERC Regions. The existing definition also does not clearly stipulate the characteristics of a SPS/RAS. The actions listed in the definition of SPS, which are incorporated by cross reference (NERC Glossary of Terms) into the definition of RAS, are ambiguous and may unintentionally include equipment whose purpose is not expressly related to preserving System reliability in response to predetermined System conditions. Employing a single term, i.e., RAS, and clarifying its definition will lead to more consistent application of the NERC Reliability Standards related to RAS.

The proposed definition of RAS must be broad to include the variety of System conditions monitored and corrective actions taken by RAS. Because of the diversity of RAS in both action and objective, the practical approach to the definition is to begin with a wide scope and then list specific exclusions. Without the exclusions, equipment and schemes that should not be considered RAS could be subject to the requirements of the RAS-related NERC Reliability Standards. The exclusion list assures that commonly applied protection and control systems are not unintentionally included as RAS.

The Project 2010-05.2 SPS SDT coordinated the development of the RAS definition with the development of PRC-010-1 by the SDT for Project 2008-02 – Undervoltage Load Shedding. The UVLS SDT introduced a new term, UVLS Program, into the Glossary of Terms Used in NERC Reliability Standards to clearly establish applicability of PRC-010-1. The proposed term UVLS Program is defined as: “An automatic load shedding program consisting of distributed relays and controls used to mitigate undervoltage conditions leading to voltage instability, voltage collapse, or Cascading impacting the Bulk Electric System (BES). Centrally controlled undervoltage-based load shedding is not included.”

Note that the proposed definition excludes centrally controlled undervoltage-based load shedding. The UVLS SDT maintains that the design and characteristics of centrally controlled undervoltage-based load shedding are commensurate with RAS (wherein load shedding is the remedial action) and, as such, should be subject to RAS-related Reliability Standards. The Project 2010-05.2 SPS SDT agreed with this assessment and revised the definition of RAS to clarify that it is exclusive of distributed UVLS relays including the newly defined term UVLS Program. Therefore, the definition is inclusive of centrally controlled undervoltage-based load shedding. Collectively, the two definitions will promote consistency in the identification of centrally controlled undervoltage-based load shedding as RAS. The coordination of these revisions is required to maintain coverage of those systems and prevent a reliability gap. As a

result of these revisions, all NERC Reliability Standards that include the term RAS will be applicable to centrally controlled undervoltage-based load shedding upon the effective dates of the revised definitions of RAS and UVLS Program.

Requested Approvals

The definition of “**Remedial Action Scheme**” and the standards are listed below:

The following standards are proposed for approval to align the use of the single defined term RAS. This list is intended to reflect Reliability Standards currently in effect at the time of Project development. In certain cases, a standard listed below for approval may already be retired pursuant to an implementation plan of a successor version by the time the definition of “Remedial Action Scheme” becomes effective in a particular jurisdiction. In these cases, the standard below will not become effective.

CIP-002-3(i)	PRC-004-WECC-2	PRC-020-2
CIP-002-3(i)b	PRC-005-2(ii)	PRC-021-2
EOP-004-3	PRC-005-3(ii)	PRC-023-2(i)
FAC-010-3	PRC-006-1(i)	PRC-023-4 ¹
FAC-011-3	PRC-012-1	TOP-005-3a
IRO-005-3.1(i)a	PRC-013-1	TPL-001-0.1(i)
MOD-029-2a	PRC-014-1	TPL-002-0(i)b
MOD-030-3	PRC-015-1	TPL-003-0(i)b
NUC-001-2.1(i)	PRC-016-1	TPL-004-0(i)a
PRC-001-1.1(i)	PRC-017-1	

Requested Retirements

CIP-002-3	PRC-004-WECC-1	PRC-020-1
CIP-002-3b	PRC-005-2	PRC-021-1
EOP-004-2	PRC-005-3	PRC-023-2
FAC-010-2.1	PRC-006-1	PRC-023-3
FAC-011-2	PRC-012-0	TOP-005-2a
IRO-005-3.1a	PRC-013-0	TPL-001-0.1
MOD-029-1a	PRC-014-0	TPL-002-0b
MOD-030-02	PRC-015-0	TPL-003-0b
NUC-001-2.1	PRC-016-0.1	TPL-004-0a
PRC-001-1.1	PRC-017-0	

¹ [There are two provisions set forth in the Implementation Plan of PRC-023-3 that are specific to load-responsive phase protection systems on circuits identified by the Planning Coordinator pursuant to Requirement R6 remain in effect. \(1\) Each Transmission Owner, Generator Owner, and Distribution Provider in Requirements R2 and R3 shall become compliant the later of the first day of the first calendar quarter 39 months following notification by the Planning Coordinator of a circuit's inclusion on a list of circuits per application of Attachment B, or the first day of the first calendar year in which any criterion in Attachment B applies, unless the Planning Coordinator removes the circuit from the list before the applicable effective date, and \(2\) Requirement R1, Criterion 6 of PRC-023-2 shall remain in force until the effective date of PRC-025-1.](#)

General Considerations

The entity shall modify its processes as necessary to account for the revised definition. The revised definition of RAS clarifies that it is inclusive of centrally controlled undervoltage-based load shedding. Entities may have additional changes to the classification of certain schemes to align them with the revised definition.

This Implementation Plan provides additional time for entities with newly classified RAS to become compliant with the Reliability Standards during the transition to the revised definition.

All aspects of the Implementation Plans for PRC-005-2 and PRC-005-3 will remain applicable to PRC-005-2(ii) and PRC-005-3(ii). These implementation plans are incorporated here by reference.

Prerequisite Approvals

NERC Reliability Standard PRC-010-1 – Undervoltage Load Shedding
Definition of “Undervoltage Load Shedding Program (UVLS Program)” in Project 2008-02 Undervoltage Load Shedding

Revisions to the NERC Glossary of Terms

The drafting team proposes the following revised definition:

Remedial Action Scheme (RAS)

A scheme designed to detect predetermined System conditions and automatically take corrective actions that may include, but are not limited to, adjusting or tripping generation (MW and Mvar), tripping load, or reconfiguring a System(s). RAS accomplish objectives such as:

- Meet requirements identified in the NERC Reliability Standards;
- Maintain Bulk Electric System (BES) stability;
- Maintain acceptable BES voltages;
- Maintain acceptable BES power flows;
- Limit the impact of Cascading or extreme events.

The following do not individually constitute a RAS:

- a. Protection Systems installed for the purpose of detecting Faults on BES Elements and isolating the faulted Elements
- b. Schemes for automatic underfrequency load shedding (UFLS) and automatic undervoltage load shedding (UVLS) comprised of only distributed relays
- c. Out-of-step tripping and power swing blocking
- d. Automatic reclosing schemes
- e. Schemes applied on an Element for non-Fault conditions, such as, but not limited to, generator loss-of-field, transformer top-oil temperature, overvoltage, or overload to protect the Element against damage by removing it from service

- f. Controllers that switch or regulate one or more of the following: series or shunt reactive devices, flexible alternating current transmission system (FACTS) devices, phase-shifting transformers, variable-frequency transformers, or tap-changing transformers; and, that are located at and monitor quantities solely at the same station as the Element being switched or regulated
- g. FACTS controllers that remotely switch static shunt reactive devices located at other stations to regulate the output of a single FACTS device
- h. Schemes or controllers that remotely switch shunt reactors and shunt capacitors for voltage regulation that would otherwise be manually switched
- i. Schemes that automatically de-energize a line for a non-Fault operation when one end of the line is open
- j. Schemes that provide anti-islanding protection (e.g., protect load from effects of being isolated with generation that may not be capable of maintaining acceptable frequency and voltage)
- k. Automatic sequences that proceed when manually initiated solely by a System Operator
- l. Modulation of HVdc or FACTS via supplementary controls, such as angle damping or frequency damping applied to damp local or inter-area oscillations
- m. Sub-synchronous resonance (SSR) protection schemes that directly detect sub-synchronous quantities (e.g., currents or torsional oscillations)
- n. Generator controls such as, but not limited to, automatic generation control (AGC), generation excitation [e.g., automatic voltage regulation (AVR) and power system stabilizers (PSS)], fast valving, and speed governing

Conforming Changes to Other Standards

The existing Reliability Standards proposed for retirement contain references to SPS or RAS or both. The revised Reliability Standards will reflect the use of the single term RAS. The revised Reliability Standards noted above for approval are included in a separate document *Revised Reliability Standards for the Revised Definition of "Remedial Action Scheme."*

Effective Date for Revised Reliability Standards and Definition

Except as noted below, the revised Reliability Standards and the revised definition of "Remedial Action Scheme" shall become effective on the first day of the first calendar quarter that is twelve (12) months after the date that the standards and definition are approved by an applicable governmental authority or as otherwise provided for in a jurisdiction where approval by an applicable governmental authority is required for a standard to go into effect. Where approval by an applicable governmental authority is not required, the standards and the definition shall become effective on the first day of the first calendar quarter that is twelve (12) months after the date the standards and definition are adopted by the NERC Board of Trustees or as otherwise provided for in that jurisdiction.

Implementation Plan for Newly Classified Remedial Action Schemes (RAS)

Entities with newly classified "Remedial Action Scheme" (RAS) resulting from the application of the revised definition must be fully compliant with all Reliability Standards applicable RAS twenty-four (24)

months from the Effective Date of the revised definition of RAS. This additional time applies only to existing schemes that must transition to RAS due to the revised definition. The additional time does not apply to future RAS that may be created following implementation of the revised definition.

Retirement of Existing Standards and Definitions

The requested Reliability Standards for retirement shall be retired at midnight of the day immediately prior to the Effective Date of its successor standard in the particular jurisdiction in which the revised definition is becoming effective. The current definition of “Remedial Action Scheme” shall be retired at midnight of the day immediately prior to the Effective Date of the revised definition of “Remedial Action Scheme”.

Exhibit B

Implementation Plan for the Revised Definition of “Remedial Action Scheme”

Clean Version

Implementation Plan for the Revised Definition of “Remedial Action Scheme”

Project 2010-05.2 – Special Protection Systems

Background

The existing Glossary of Terms Used in NERC Reliability Standards definition for “Special Protection System” (“SPS”) or “Remedial Action Scheme” (“RAS”) lacks the specificity necessary to consistently identify what equipment or protection schemes qualify as SPS/RAS across the eight NERC Regions. The existing definition also does not clearly stipulate the characteristics of a SPS/RAS. The actions listed in the definition of SPS, which are incorporated by cross reference (NERC Glossary of Terms) into the definition of RAS, are ambiguous and may unintentionally include equipment whose purpose is not expressly related to preserving System reliability in response to predetermined System conditions. Employing a single term, i.e., RAS, and clarifying its definition will lead to more consistent application of the NERC Reliability Standards related to RAS.

The proposed definition of RAS must be broad to include the variety of System conditions monitored and corrective actions taken by RAS. Because of the diversity of RAS in both action and objective, the practical approach to the definition is to begin with a wide scope and then list specific exclusions. Without the exclusions, equipment and schemes that should not be considered RAS could be subject to the requirements of the RAS-related NERC Reliability Standards. The exclusion list assures that commonly applied protection and control systems are not unintentionally included as RAS.

The Project 2010-05.2 SPS SDT coordinated the development of the RAS definition with the development of PRC-010-1 by the SDT for Project 2008-02 – Undervoltage Load Shedding. The UVLS SDT introduced a new term, UVLS Program, into the Glossary of Terms Used in NERC Reliability Standards to clearly establish applicability of PRC-010-1. The proposed term UVLS Program is defined as: “An automatic load shedding program consisting of distributed relays and controls used to mitigate undervoltage conditions leading to voltage instability, voltage collapse, or Cascading impacting the Bulk Electric System (BES). Centrally controlled undervoltage-based load shedding is not included.”

Note that the proposed definition excludes centrally controlled undervoltage-based load shedding. The UVLS SDT maintains that the design and characteristics of centrally controlled undervoltage-based load shedding are commensurate with RAS (wherein load shedding is the remedial action) and, as such, should be subject to RAS-related Reliability Standards. The Project 2010-05.2 SPS SDT agreed with this assessment and revised the definition of RAS to clarify that it is exclusive of distributed UVLS relays including the newly defined term UVLS Program. Therefore, the definition is inclusive of centrally controlled undervoltage-based load shedding. Collectively, the two definitions will promote consistency in the identification of centrally controlled undervoltage-based load shedding as RAS. The coordination of these revisions is required to maintain coverage of those systems and prevent a reliability gap. As a

result of these revisions, all NERC Reliability Standards that include the term RAS will be applicable to centrally controlled undervoltage-based load shedding upon the effective dates of the revised definitions of RAS and UVLS Program.

Requested Approvals

The definition of “**Remedial Action Scheme**” and the standards are listed below:

The following standards are proposed for approval to align the use of the single defined term RAS. This list is intended to reflect Reliability Standards currently in effect at the time of Project development. In certain cases, a standard listed below for approval may already be retired pursuant to an implementation plan of a successor version by the time the definition of “Remedial Action Scheme” becomes effective in a particular jurisdiction. In these cases, the standard below will not become effective.

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NUC-001-2.1	PRC-016-0.1	TPL-004-0a
PRC-001-1.1	PRC-017-0	

¹ This Implementation Plan carries forward and incorporates by reference the following two provisions set forth in the Implementation Plan associated with Reliability Standard PRC-023-3 that are specific to load-responsive phase protection systems on circuits identified by the Planning Coordinator pursuant to Requirement R6: (1) Each Transmission Owner, Generator Owner, and Distribution Provider in Requirements R2 and R3 shall become compliant the later of the first day of the first calendar quarter 39 months following notification by the Planning Coordinator of a circuit’s inclusion on a list of circuits per application of Attachment B, or the first day of the first calendar year in which any criterion in Attachment B applies, unless the Planning Coordinator removes the circuit from the list before the applicable effective date; and (2) Requirement R1, Criterion 6 of PRC-023-2 shall remain in force until the effective date of PRC-025-1.

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months from the Effective Date of the revised definition of RAS. This additional time applies only to existing schemes that must transition to RAS due to the revised definition. The additional time does not apply to future RAS that may be created following implementation of the revised definition.

Retirement of Existing Standards and Definitions

The requested Reliability Standards for retirement shall be retired at midnight of the day immediately prior to the Effective Date of its successor standard in the particular jurisdiction in which the revised definition is becoming effective. The current definition of “Remedial Action Scheme” shall be retired at midnight of the day immediately prior to the Effective Date of the revised definition of “Remedial Action Scheme”.