

ARC Operations Work Group Assessment and Conversion of NERC PRC-022-1 to Alberta PRC-022-AB-1 Under-Voltage Load Shedding Program Performance

| Section | NERC PRC-022-1 | Alberta PRC-022-AB-1 | Reason for Difference¹ |
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| Purpose | Ensure that Under Voltage Load Shedding (UVLS) programs perform as intended to mitigate the risk of voltage collapse or voltage instability in the Bulk Electric System (BES). | <u>The purpose of this reliability standard is to ensure that Under Voltage Load Shedding (UVLS) programs perform as intended to mitigate the risk of voltage collapse or voltage instability in the Bulk Electric System (BES) AES.</u> | |
| Applicability | 4.1. Transmission Operator that operates a UVLS program. 4.2. Distribution Provider that operates a UVLS program. 4.3. Load-Serving Entity that operates a UVLS program. | 4.1. Transmission Operator that operates a UVLS program. 4.2. Distribution Provider that operates a UVLS program. 4.3. Load-Serving Entity that operates a UVLS program. <u>This reliability standard applies to the ISO.</u> | |
| Effective Date | May 1, 2006 | <u>May 1, 2006 10 calendar days after the date of approval by the Commission.</u> | |
| Definitions | | Italicized terms used in this reliability standard have the same meanings as set out in the Alberta Reliability Standards Glossary of Terms and Part 1 of the ISO Rules. ² | Added definitions section to the Alberta reliability standard. |
| Requirement | R1. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a | R1. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that | Added that reporting is to be done in accordance |

¹ The following revisions have been made throughout this proposed reliability standard:

- Identified the responsible entities in Alberta.
- Applied a consistent writing style and added clarity.
- Changed passive terms such as “shall” to “must”.

² Defined terms are not italicized in this document, but will appear in the Alberta Reliability Standards document.

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| | 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: | operates a UVLS program to mitigate the risk of voltage collapse or voltage instability in the BES shall <u>The ISO must</u> analyze and document all UVLS operations and M misoperations <u>in accordance with ISO rules.</u> The analysis shall include: | with existing operating policy and procedures. |
| Measure | | MR1. Documentation of UVLS operations and misoperations exists <u>Event reports exist for UVLS events that require a report in accordance with ISO rules.</u> | |
| Requirement | <p>R1.1. A description of the event including initiating conditions.</p> <p>R1.2. A review of the UVLS set points and tripping times.</p> <p>R1.3. A simulation of the event, if deemed appropriate by the Regional Reliability Organization. For most events, analysis of sequence of events may be sufficient and dynamic simulations may not be needed.</p> <p>R1.4. A summary of the findings.</p> <p>R1.5. For any Misoperation, a Corrective Action Plan to avoid future Misoperations of a similar nature.</p> | <p>R2. <u>The ISO's analysis of UVLS operations and misoperations shall</u> <u>must include</u> without limitation the following:</p> <ul style="list-style-type: none"> • A description of the <u>UVLS</u> event including initiating conditions. • A review of the UVLS set points and tripping times. • <u>An</u> analysis of <u>the</u> sequence of events. — A simulation of the event, if deemed appropriate by the Regional Reliability Organization <u>WECC. For most events, analysis of sequence of events may be sufficient and dynamic simulations may not be needed.</u> • A summary of the findings. • For any Mmisoperation, a Ccorrective <u>A</u>ction <u>P</u>lan <u>to avoid future</u> | <p>Omitted “dynamic simulations may not be needed” as stated in NERC R1.3 as it is not a requirement.</p> <p>Included the analysis of the sequence of events as a requirement.</p> |

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| | | <p>Misoperations of a similar nature.</p> <p>R3. The ISO must A-simulation of the <u>simulate</u> the <u>UVLS</u> event, <u>within the time frame agreed to by the ISO, if WECC makes a written request for a simulation deemed requested appropriate by the Regional Reliability Organization WECC.</u> For most events, analysis of sequence of events may be sufficient and dynamic simulations may not be needed</p> | |
| Measure | <p>M1. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a UVLS program shall have documentation of its analysis of UVLS operations and Misoperations in accordance with Requirement 1.1 through 1.5.</p> | <p>M1. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a UVLS program shall have documentation of its analysis of UVLS operations and Misoperations in accordance with Requirement 1.1 through 1.5. MR232. <u>Documentation of the analysis includes the items listed in R2.</u></p> <p>MR3. <u>Results of the simulation exists.</u></p> | |
| Requirement | <p>R2. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a UVLS program shall provide documentation of its analysis of UVLS program performance to its Regional Reliability Organization within 90 calendar days of a request.</p> | <p>R42. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a UVLS program <u>The ISO must shall</u> provide documentation of its analysis of <u>a</u> UVLS program performance to its Regional Reliability Organization <u>the WECC</u> within 90 calendar days of a request <u>from WECC.</u></p> | |

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| Measure | M2. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a UVLS program shall have evidence that it provided documentation of its analysis of UVLS program performance within 90 calendar days of a request by the Regional Reliability Organization. | M2. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a UVLS program shall have evidence that it provided documentation of its analysis of UVLS program performance within 90 calendar days of a request by the Regional Reliability Organization. MR4. <u>Written confirmation from the WECC that documentation was received within 90 calendar days.</u> | |
| Procedures | | | |
| Compliance | To view the compliance section D of the NERC reliability standard follow this link: http://www.nerc.com/files/PRC-022-1.pdf | | There is no compliance section currently proposed in the Alberta Reliability Standards. A compliance program will be developed at a later date for Alberta Reliability Standards that recognizes the compliance monitoring and enforcement structure in Alberta. This approach is deemed consistent with the |

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| | | | existing ISO Rules. |
| Regional Differences | None identified. | None identified. | Not applicable in Alberta |

Proposed Terms for the Alberta Reliability Standard Glossary:

"misoperation" means any one the following:

- any failure of a protection system element to operate within the specified time when a fault or abnormal condition occurs within a zone of protection;
- any operation for a fault not within a zone of protection, except an operation as backup protection for a fault in an adjacent zone that is not cleared within a specified time for the protection for that zone;
- any unintentional protection system operation when no fault or other abnormal condition has occurred unrelated to on-site maintenance and testing activity.

"protection system" means protective relays, associated communication systems, voltage and current sensing devices, station batteries and DC control circuitry

Existing Defined Terms Used in this Standard:

(As included in the ISO Rules Definitions or Alberta Reliability Standards Glossary)

- Commission
- ISO
- under voltage load shed (UVLS)
- WECC
- AIES
- reliability standard



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