

PRC-004-WECC-AB~~1~~-1

Protection System and Remedial Action Scheme Misoperation

1. Purpose

The purpose of this *reliability standard* is to ensure all *misoperations* of transmission and generation *protection systems* and *RASs* on transmission paths are analyzed and mitigated.

2. Applicability

This *reliability standard* applies to:

- (a) ~~the legal owner of a transmission facility~~ ~~TFOs of selected~~ that is the legal owner of a WECC major transmission path ~~facilities facility and or~~ RAS listed in the tables titled “Major WECC Transfer Paths in the Bulk Electric System” and “Major WECC Remedial Action Schemes (RAS)” as provided by the WECC; ~~provided at (http://www.wecc.biz/documents/library)~~
- (b) the operator of a transmission facility that operates a WECC major transmission path ~~facility or~~ RAS listed in the tables titled “Major WECC Transfer Paths in the Bulk Electric System” and “Major WECC Remedial Action Schemes (RAS)” as provided by the WECC;
- (c) the legal owner of a generating unit ~~GFOs~~ that owns components of *RASs* listed in the table titled “Major WECC Remedial Action Schemes (RAS)” as provided by the WECC ~~provided at (http://www.wecc.biz/documents/library);~~
- (d) the legal owner of an aggregated generating facility that owns components of *RASs* listed in the table titled “Major WECC Remedial Action Schemes (RAS)” as provided by the WECC;
- (e) ~~the operators~~ of a generating units that operates *RASs* listed in the table titled “Major WECC Remedial Action Schemes (RAS)” as provided by the WECC; ~~provided at (http://www.wecc.biz/documents/library)~~
- (f) the operator of an aggregated generating facility that operates *RASs* listed in the table titled “Major WECC Remedial Action Schemes (RAS)” as provided by the WECC; and
- (g) the ISO.

3. Definitions

Italicized terms used in this *reliability standard* have the meanings as set out in the *Alberta Reliability Standards Glossary of Terms and Part 1 of the ISO Rules Consolidated Authoritative Document Glossary*.

4. Requirements

- R1 Each legal owner of a transmission facility, legal owner of a generating unit, legal owner of an aggregated generating facility, operator of a transmission facility, operator

of a generating unit and operator of an aggregated generating facility ~~TFO, GFO and operator of a generating unit~~ must ensure that its system operators and protection personnel analyze all *protection system* and *RAS* operations as follows:

- R1.1** Each operator of a transmission facility, operator of a generating unit ~~TFO and operator of a generating unit~~ and operator of an aggregated generating facility must review all tripping of transmission *elements* and *RAS* operations to identify apparent *misoperations* within 24 hours.
- R1.2** ~~TFO and GFO~~ protection personnel of the legal owner of a transmission facility, the legal owner of a generating unit and the legal owner of an aggregated generating facility must analyze all operations of *protection systems* and *RAS* within 20 business days of the operation of either such system or *RAS* to determine whether a *misoperation* has occurred.

- R2** Each legal owner of a transmission facility ~~TFOs,~~ and legal owner of a generating unit and legal owner of an aggregated generating facility ~~GFOs~~ must ~~each~~ perform the actions listed in requirements R2.1 to R2.4 inclusive for each *misoperation* of the *protection system* or *RAS*, subject to the following:

Requirements R2.1 to R2.4 inclusive do not apply to *protection system* and/or *RAS* operations that appear to have operated correctly at the time of occurrence. If the legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility ~~TFO or GFO~~ later finds through system protection personnel analysis that the *protection system* or *RAS* misoperated, the requirements of R2.1 to R2.4 inclusive become applicable at the time the legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility ~~TFO or GFO~~ identifies the *misoperation*.

Table 1 is provided as a simplified summary of the requirements in R2.1 to R2.4 inclusive.

- R2.1** If the *protection system* or *RAS* has a *security-based misoperation* and two or more *FEPS* or *FERAS* remain in service to ensure *BES reliability*, ~~each~~ the legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility ~~TFO or GFO~~ must remove from service the *protection system* or *RAS* that misoperated, within 22 hours following the identification of the *misoperation*.

Repair or replacement of the failed *protection system* or *RAS* is at the discretion of the legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility ~~TFO or GFO~~.

- R2.2** If the *protection system* or *RAS* has a *security-based misoperation* and only one *FEPS* or *FERAS* remains in service to ensure *BES reliability*, the legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility ~~TFO or GFO~~ responsible for the *protection system* or *RAS*, as the case may be, must perform the following:

R2.2.1 Remove from service, within 22 hours for repair or modification, the *protection system* or *RAS* that misoperated.

R2.2.2 Repair or replace any *protection system* or *RAS* that misoperated with a *FEPS* or *FERAS* within 20 business days of the date of removal.

R2.2.3 Remove the *element* from service or disable the *RAS* if repair or replacement is not completed within 20 business days.

R2.3 If the *protection system* or *RAS* has a *security-based* or *dependability-based misoperation* and a *FEPS* or *FERAS* is not in service to ensure *BES reliability*, the [legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility](#) ~~TFO or GFO~~ responsible for the *protection system* or *RAS*, as the case may be, must repair and place back in service within 22 hours the *protection system* or *RAS* that misoperated.

If this cannot be done, the responsible [legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility](#) ~~TFO or GFO~~ must perform the following:

R2.3.1 When a *FEPS* is not available, remove the associated *element* from service.

R2.3.2 When *FERAS* is not available, meet one of the following requirements:

R2.3.2.1 If the responsible entity is a [legal owner of a generating unit or legal owner of an aggregated generating facility](#) ~~GFO~~ it must advise the *ISO*, and [the operator of a generating unit or operator of an aggregated generating facility must](#) adjust generation to a reliable operating level as directed by the *ISO*.

R2.3.2.2 If the responsible entity is a [legal owner of a transmission facility](#) ~~TFO~~ it must advise the *ISO*, and [the operator of a transmission facility must](#) operate the *facilities* within the adjusted *SOL* as determined and directed by the *ISO*.

R2.4 If the *protection system* or *RAS* has a *dependability-based misoperation*, but has one or more *FEPS* or *FERAS* that operated correctly, the associated *element* or transmission path may remain in service without removing from service the *protection system* or *RAS* that failed, provided one of the following is performed:

~~Each~~ **R2.4.1** [The legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility](#) ~~TFO or GFO~~ must repair or replace any *protection system* or *RAS* that misoperated with *FEPS* and *FERAS* within 20 business days of the date of the *misoperation* identification, or

R2.4.2 ~~Each~~ [The legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility](#) ~~TFO or GFO~~ must remove from service the associated *element* or *RAS*.

R3 [The legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility](#) ~~TFOs and GFOs~~ must submit a *misoperation* incident report to the *ISO* within six business days of identifying the *misoperation* for the following:

R3.1 Identification of a *misoperation* of a *protection system* and/or *RAS*.

R3.2 Completion of repairs or the replacement of the *protection system* and/or *RAS* that misoperated.

R4 The *ISO* must submit *misoperation* incident reports to *WECC* within 10 business days of identifying the *misoperation*.

5. Processes and Procedures

No procedures have been defined for this *reliability standard*.

6. Measures

The following measures correspond to the requirements identified in Section 4 of this *reliability standard*. For example, MR1 is the measure for R1.

MR1 Measures for this requirement are identified in the subsections below.

MR1.1 Documentation exists that confirms a review was completed within the timelines as specified in requirement R1.1.

MR1.2 Documentation exists that confirms an analysis was completed and in the timelines as specified in requirement R1.2.

MR2 Measures for this requirement are identified in the subsections below.

MR2.1 Evidence exists and shows that required actions were taken in the timelines as specified in requirement R2.1.

MR2.2 Measures for this requirement are identified in the subsections below.

MR2.2.1 Evidence exists and shows that required actions were taken in the timelines as specified in requirement R2.2.1.

MR2.2.2 Evidence exists and shows that required actions were taken in the timelines as specified in requirement R2.2.2.

MR2.2.3 Evidence exists and shows that required actions were taken in the timelines as specified in requirement R2.2.3.

MR2.3 Evidence exists and shows that required actions were taken in the timelines as specified in requirement R2.3.

MR2.3.1 Evidence exists and shows that required actions were taken in the timelines as specified in requirement R2.3.1.

MR2.3.2 Measures for this requirement are identified in the subsections below.

MR2.3.2.1 Evidence exists and shows that required actions were taken in the timelines as specified in requirement R2.3.2.1.

MR2.3.2.2 Evidence exists and shows that required actions were taken in the timelines as specified in requirement R2.3.2.2.

MR2.4 Measures for this requirement are identified in the subsections below

MR2.4.1 Evidence exists and shows that required actions were taken in the timelines as specified in requirement R2.4.1.

MR2.4.2 Evidence exists and shows that required actions were taken in the timelines as specified in requirement R2.4.2.

MR3 *Misoperation* incident report is submitted within timelines as specified in requirement R3.

MR3.1 *Misoperation* incident report contains content as specified in requirement R3.1.

MR3.2 *Misoperation* incident report contains content as specified in requirements R3.2.

MR4 Confirmation exists that incident reports as specified in requirement R4 were received within the timelines specified, or evidence that requests for confirmation were made for the incident reports provided as specified in requirement R4.

7. Appendices

Appendix 1 – Requirement R2: Table of Required Actions for *Protection System or RAS Misoperation* (see below)

8. Guidelines

No guidelines have been defined for this *reliability standard*.

Revision History

Effective	Description
<u>2012-xx-xx</u>	<u>Administrative update – “TFO and GFO” replaced with “legal owner of a transmission facility” “legal owner of a generating unit” and “legal owner of an aggregated generating facility”; and other minor cleanup items.</u>
2010-02-11	New Issue

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PRC - 004 - WECC - 1 Requirement R2 - Table of Required Actions for <i>Protection System</i> or <i>RAS Misoperation</i>					
Protective System/RAS Situation			Required Mitigating Actions		
Protection Basis:	Number of <i>FEPS</i> or <i>RAS</i> in place after <i>misoperation</i>	Misoperating <i>protection system</i> is:	<i>Protection System/RAS</i> Removal Requirement	<i>Protection System/RAS</i> Repair or Replacement Requirement	<i>Element</i> Removal Requirement
Security	2 or more	PS	Remove within 22h.	At owners discretion.	
	1	PS	Remove within 22h.	Repair within 20 <i>days</i> .	Remove <i>element</i> from service.
	0	PS	None.	Repair within 22 hours.	If not repaired in 22 hours then remove <i>element</i> from service.
	2 or more	<i>RAS</i>	Remove within 22h.	At owners discretion.	
	1	<i>RAS</i>	Remove within 22h.	Repair within 20 <i>days</i> .	If not repaired in 20 days then disable <i>RAS</i> or remove <i>element</i> from service.
	0	<i>RAS</i>	None.	Repair within 22 hours.	Either the legal owner of a transmission facility , legal owner of a generating unit or legal owner of an aggregated generating facility , TFO or GFO must advise the ISO, and the operator of a generating unit or operator of an aggregated generating facility must adjust generating operating levels to a reliable operating level as directed by the ISO or the ISO will adjust the SOL and the TFOs operator of a transmission facility will operate the <i>facilities</i> within established limits.
Dependability	1 or more that operated correctly	PS	Can leave in service.	Repair in 20 <i>days</i> or remove <i>element</i> from service.	
	0	PS	None.	Repair within 22 hours.	If not repaired in 22 hours then remove <i>element</i> from service.
	1 or more that operated correctly	<i>RAS</i>	Can leave in service.	Repair in 20 <i>days</i> or remove <i>RAS</i> or <i>element</i> from service.	

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	0	RAS	None.	Repair within 22 hours.	<p>Either the <u>legal owner of a transmission facility, legal owner of a generating unit or legal owner of an aggregated generating facility</u> TFO or GFO must advise the ISO, and the <u>operator of a generating unit or operator of an aggregated generating facility</u> must adjust generating operating levels to a reliable operating level as directed by the ISO or the ISO will adjust the SOL and the <u>operator of a transmission facility</u> TFOs will operate the facilities within established limits.</p>
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