
PRC-004-WECC-AB-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:

- *TFOs* of selected *WECC* major transmission path *facilities* and *RAS* listed in the tables titled “Major WECC Transfer Paths in the Bulk Electric System” provided at (<http://www.wecc.biz/documents/library>) and “Major WECC Remedial Action Schemes (RAS)” provided at (<http://www.wecc.biz/documents/library>)
- *GFOs* that own components of *RASs* listed in the table titled “Major WECC Remedial Action Schemes (RAS)” provided at (<http://www.wecc.biz/documents/library>)
- Operators of generating units that operate *RASs* listed in the table titled “Major WECC Remedial Action Schemes (RAS)” provided at (<http://www.wecc.biz/documents/library>)
- *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](#).

4. Requirements

R1 Each *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 *TFO* and operator of a generating unit must review all tripping of transmission *elements* and *RAS* operations to identify apparent *misoperations* within 24 hours.

R1.2 *TFO* and *GFO* protection personnel 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 *TFOs* and *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

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 *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 *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 *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 *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 *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 *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 *GFO* it must advise the *ISO* and adjust generation to a reliable operating level as directed by the *ISO*.

R2.3.2.2 If the responsible entity is a *TFO* it must advise the *ISO* and 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:

- R2.4.1** Each *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 *TFO* or *GFO* must remove from service the associated *element* or *RAS*.
- R3** *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
2010-02-11	New Issue

PRC– 004–WECC–AB–1
Protection System and Remedial Action Scheme Misoperation

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 <i>days</i> then disable <i>RAS</i> or remove <i>element</i> from service.
	0	<i>RAS</i>	None.	Repair within 22 hours.	Either the <i>TFO</i> or <i>GFO</i> must advise the <i>ISO</i> and adjust generating operating levels to a reliable operating level as directed by the <i>ISO</i> or the <i>ISO</i> will adjust the <i>SQL</i> and the <i>TFOs</i> 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.	
	0	<i>RAS</i>	None.	Repair within 22 hours.	Either the <i>TFO</i> or <i>GFO</i> must advise the <i>ISO</i> and adjust generating operating levels to a reliable operating level as directed by the <i>ISO</i> or the <i>ISO</i> will adjust the <i>SQL</i> and the <i>TFOs</i> will operate the <i>facilities</i> within established limits.