Alberta Reliability Standard
Protection System and Remedial Action Scheme Misoperation
PRC-004-WECC-AB1-1

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** that is the **legal owner** of 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;**

(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 that owns components of RASs listed in the table titled "Major WECC Remedial Action Schemes (RAS)" as provided by the WECC;

(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 **operator** of a **generating unit** that operates **RASs** listed in the table titled "Major WECC Remedial Action Schemes (RAS)" as provided by the **WECC;**

(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

Bold terms used in this **reliability standard** have the meanings as set out in the ***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** must ensure that its **system operator**s 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** and **operator** of an **aggregated generating facility** must review all tripping of transmission **system elements** and **RAS** operations to identify apparent **misoperations** within 24 hours.

R1.2 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**, **legal owner** of a **generating unit** and **legal owner** of an **aggregated generating facility** must 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** 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** identifies the **misoperation.**

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

2.1 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**, the **legal owner** of a **transmission facility**, **legal owner** of a **generating unit** or **legal owner** of an **aggregated generating facility** 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.**

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** 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 **system 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** 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 must perform the following:

R2.3.1 When a **FEPS** is not available, remove the associated **system 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,** 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**, 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 **system 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 The **legal owner** of a **transmission facility**, **legal owner** of a **generating unit** or **legal owner** of an **aggregated generating facility** 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 The **legal owner** of a **transmission facility**, **legal owner** of a **generating unit** or **legal owner** of an **aggregated generating facility** must remove from service the associated **system 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** 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

Date	Description
2016-08-30	Inclusion of the defined term **system element**.
2013-01-02	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.
2010-02-11	New Issue

Appendix 1 – Requirement R2: Table of Required Actions for Protection System or RAS Misoperation

PRC-004-WECC-1 Requirement R2 - Table of Required Actions for **Protection System** or **RAS Misoperation**					
Protective System/RAS Situation			Required Mitigating Actions		
Protection Basis:	Number of **FEPS** or **RAS** in place after **misoperation**	Misoperating **protection system** is:	**Protection System/RAS** Removal Requirement	**Protection System/RAS** Repair or Replacement Requirement	**System Element** Removal Requirement
Security	2 or more	PS	Remove within 22h.	At owners discretion.	
	1	PS	Remove within 22h.	Repair within 20 **days**.	Remove **system element** from service.
	0	PS	None.	Repair within 22 hours.	If not repaired in 22 hours then remove **system element** from service.
	2 or more	**RAS**	Remove within 22h.	At owners discretion.	
	1	**RAS**	Remove within 22h.	Repair within 20 **days**.	If not repaired in 20 days then disable **RAS** or remove **system element** from service.
	0	**RAS**	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** 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 **operator** of a **transmission facility** will operate the **facilities** within established limits.

Dependability	1 or more that operated correctly	PS	Can leave in service.	Repair in 20 **days** or remove **system element** from service.	
	0	PS	None.	Repair within 22 hours.	If not repaired in 22 hours then remove **system element** from service.
	1 or more that operated correctly	PS	Can leave in service.	Repair in 20 **days** or remove **RAS** or **system element** from service.	
	0	**RAS**	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** 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 **operator** of a **transmission facility** will operate the **facilities** within established limits.