



WECC PCS

October 3, 2024

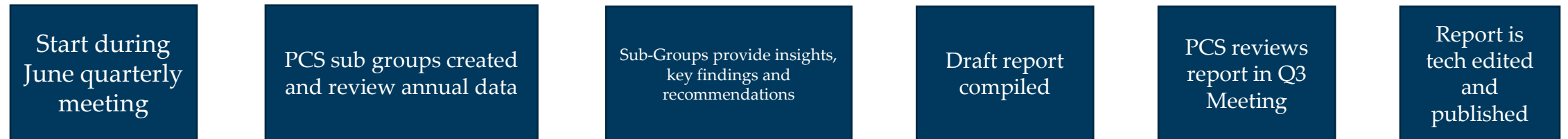
James Hanson
WECC PCS Liaison

MIDAS Review and Report Process

Review Process

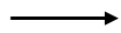


Report Process



WECC Regional Organization Structure

WECC Board



Reliability Risk Committee (RRC)



Protection and Control Subcommittee (PCS)



Program Areas ▾

Committees ▾

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Toolbox

About ▾

Search

Reliability Risk Committee

- CSF
- DEEMSF
- EPAS
- ESF
- GOPF
- HPF
- ISEAS
- PCS
- PS
 - OAWG
- PSF
- RASRS
- TCOMS



Protection and Control Subcommittee

The purpose of the PCS is to provide technical support to other WECC groups in the areas of system protection and Remedial Action Schemes relating to the operation of the Western Interconnection.

Staff Liaison

[James Hanson](#)

Chair

[Bill Middaugh](#)

Vice Chair

[Dean Bender](#)

Announcements

No current announcements

Meetings

[See all upcoming meetings +](#)

- [PCS - Protection and Control Subcommittee](#)
October 3, 2024

PCS Site

Members

Governance and Charter

Action Items

Approval Items

Approved Documents

<u>File Type</u>	<u>Title</u>	<u>Modified</u>
PDF	Guideline - Application for Echo Keying Logic on Permissive Overreaching Transfer Trip Schemes	2024-06-20
PDF	Guideline for Protection System Loadability	2024-06-20
PDF	Guideline for Time Synchronization of Protection Control and Monitoring	2024-06-20
PDF	PCS 2022 Misoperation Report Final	2024-06-20
PDF	System Operation Investigation Analysis Workflow	2024-06-20
PDF	White Paper on EHV Transmission Line Protection	2024-06-20
PDF	White Paper on Prevention of Negative-Sequence Element Misoperations During Unbalanced Conditions	2024-06-20

Approved Minutes

Misoperation Reduction Efforts

- Annual Reports
- Misoperation Reduction Strategy
 - Defined goal
 - Industry guided and incorporated feedback
 - Tracking progress
- Misoperations Workshops

Annual Report

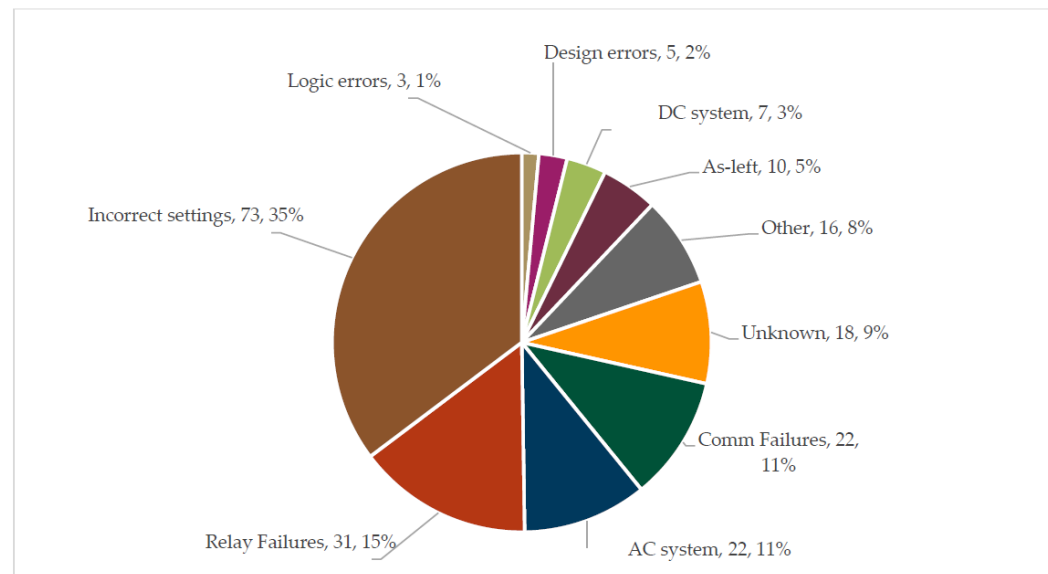
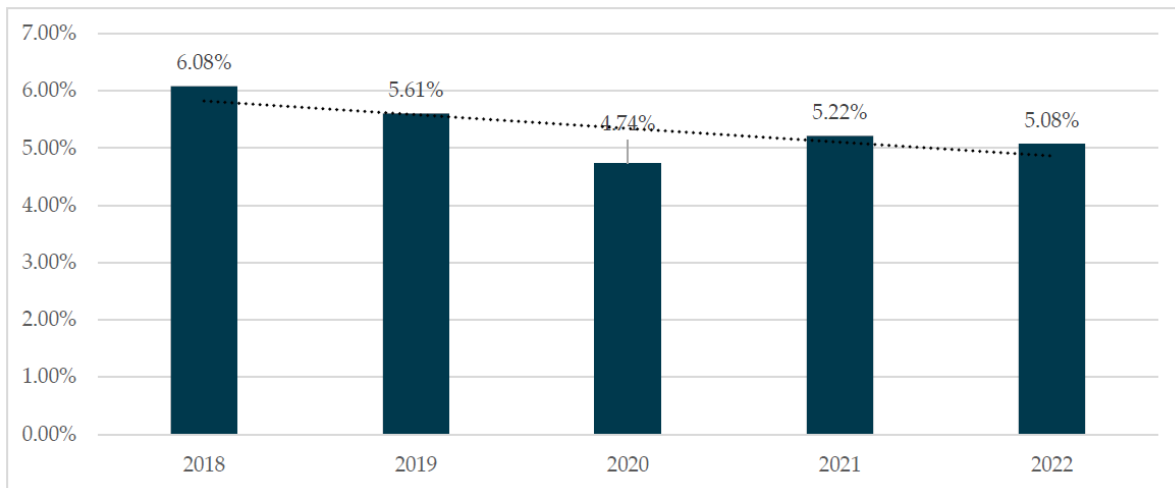


Table 1: 2022 Misoperations per 100 TADS Elements in voltage class

Voltage Class	AC Circuit	Converter	DC Circuit	Transformer	Total Elements per voltage class	# Misops	Misops per 100 elements in voltage class
0–99 kV	505	0	0	42	547	5	0.9
100–199 kV	3319	0	0	186	3505	86	2.5
200–299 kV	1964	5	3	716	2688	69	2.6
300–399 kV	203	2	0	181	386	25	6.5
400–599 kV	305	0	6	247	558	22	3.9

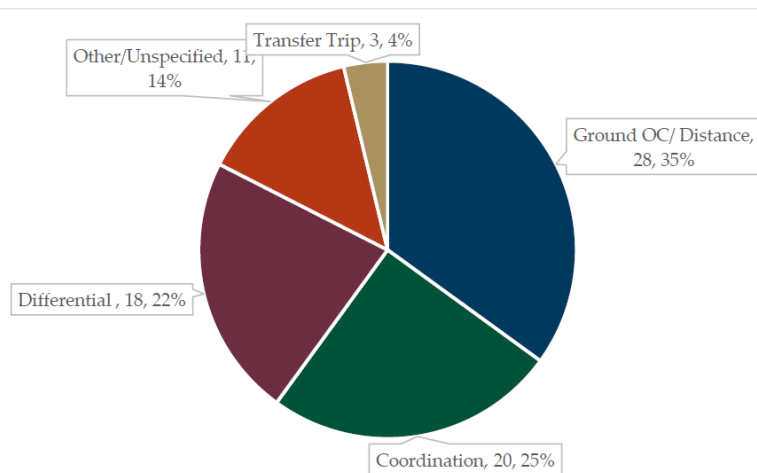
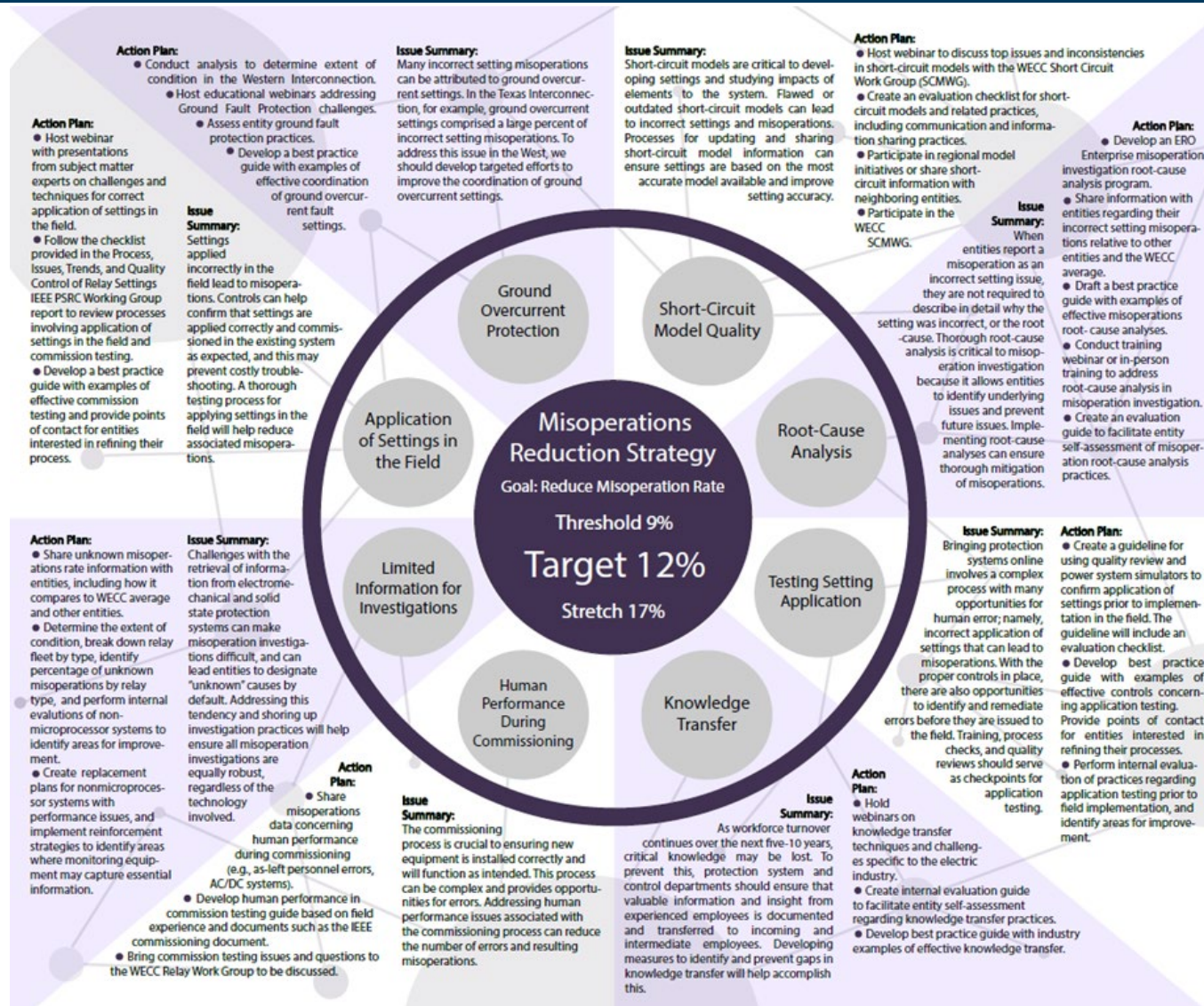
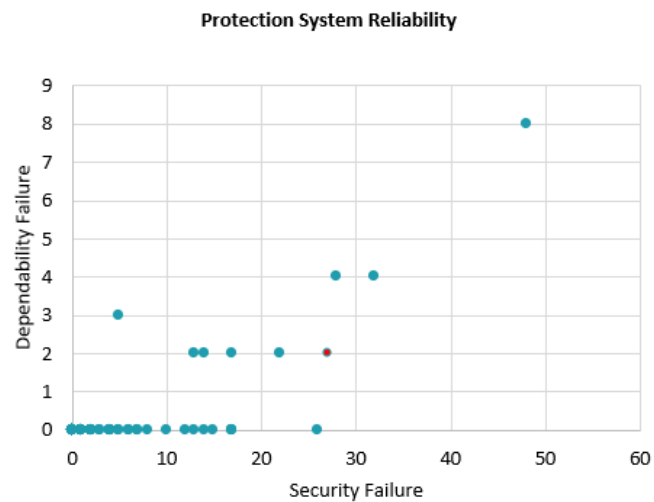
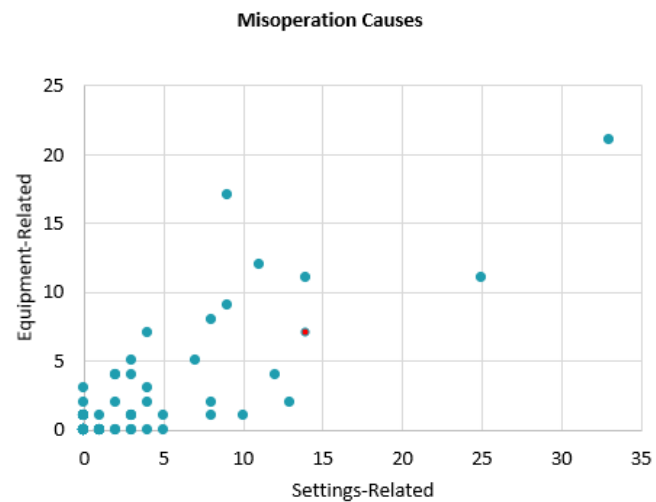
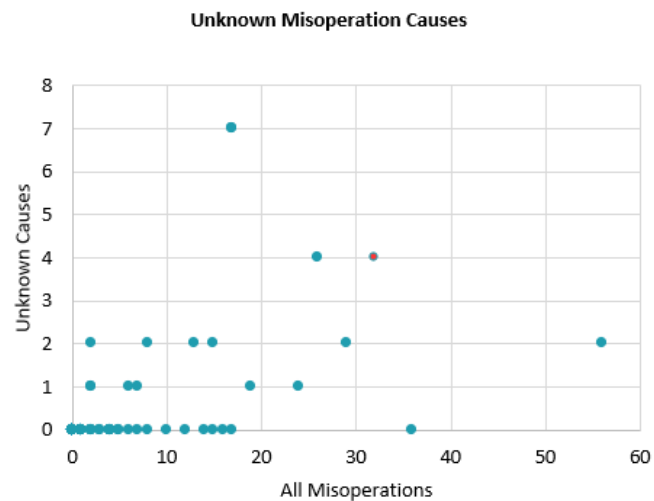
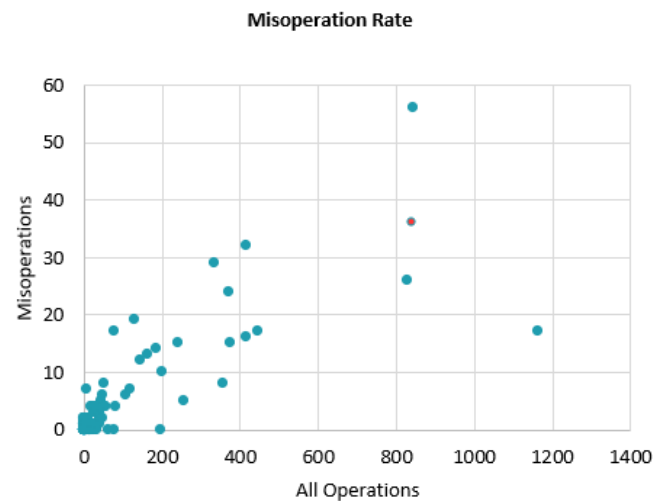


Figure 15: 2022 settings and logic/design errors by root cause

Misoperation Reduction Strategy



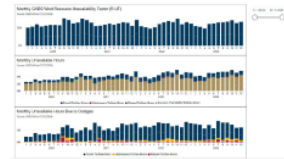
WECC Efforts with MIDAS Data



System Performance Data Portal

Home FAQ

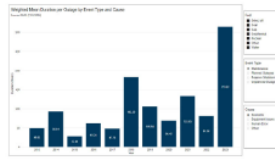
Wind Availability



Resource availability/unavailability for the Wind Generation Fleet in the Western Interconnection.

[Wind Availability](#)

Conventional Availability



The industry collects data on the performance of electric generating equipment, and the causes resulting in these generators being unavailable to generate.

[Conventional Availability](#)

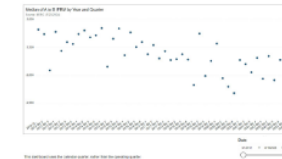
Balancing Area Exchange



Balancing Area Exchange information.

[Balancing Area Exchange](#)

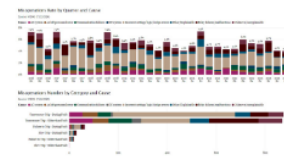
Frequency Response



Interconnection Frequency Response Measure (IFRM) measures the amount of primary frequency response deployed after an event.

[Frequency Response](#)

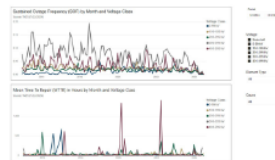
Protection System Misoperations



It is crucial that Protection systems operate correctly to remove faults from the system to protect sensitive equipment and maintain system stability.

[Protection System Misoperations](#)

Transmission Availability



Data related to the performance of BES transmission equipment and causes for these to become unavailable.

[Transmission Availability](#)

System Frequency



Frequency in the Western Interconnection is normally controlled to 60 Hz. A stable system frequency means a balance of load to generation

[System Frequency](#)

Reliability and Security Indicators

Reliability & Security Indicator Dashboard

The WECC Reliability and Security indicators provide an overview of system health for stakeholders and the general public. These indicators will be updated quarterly with new data and will change as our system reliability and security risks change. Each indicator is based on datasets and analyses that are described in detail under each indicator.

Reliability and Security Indicators Q1 2024



Typical and good



Somewhat unusual
and may be of
some concern



Unusual and may
be a more serious
concern

Click icons for more
information



**Indicator 1: Reportable
Events**



**Indicator 2: Protection
System Misoperations**



**Indicator 3:
Transmission Outages**



**Indicator 4: Energy
Emergency Alerts**



**Indicator 5: Operation
Outside BAAL**



**Indicator 6: System
Frequency**



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