# Indicator 1: Number and Severity of Reported Events



## What it measures

Indicator 1 measures the frequency and severity of events that occur on the system each quarter. This measurement is based on the <u>NERC Event Analysis Process</u> to track and evaluate events. The indicator measures only <u>reported events</u> evaluated through that process.

## How it is measured

Indicator 1 is based on two characteristics of reported events:

- 1.Sum of the <u>Event Severity Risk Index</u> (eSRI) number for each event every quarter.
- 2. Number of Category 2 and higher events each quarter.\*

\*Category 2 and higher events are rare, typically fewer than one per year. One Category 2 event occurred in Q3 2022.

# Why this matters

Events pose a risk to system reliability. Category 2 or higher events are more significant events that have severe impacts on the system.

# What does the Q3 2024 evaluation tell us?

There were eight categorized events in the Western Interconnection in Q3 of 2024. Seven of these were category 1a events, one was a category 1h event.

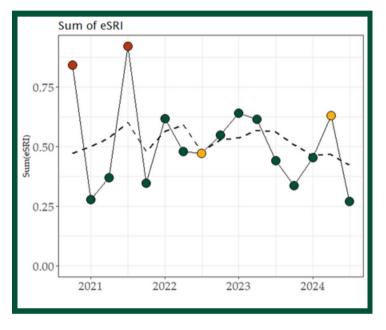
Of these eight events, two affected customer loads with an outage duration less than two hours, while seven affected generation resources with return-to-service times of a few minutes to a few hours. The shorter duration of these outages result in a reduction in the system impacts from the events. Due to these reduced impacts, the eSRI sum for the quarter is the lowest since Q4 of 2020 and well below the rolling average. This reduction in the eSRI also returns the index status to the typical and good level for Q3.

#### DATA SOURCE

The Event Analysis Management System NERC eSRI metric



Indicator Performance History





# Indicator 2: Rate of Protection System Misoperations



## What it measures

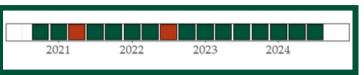
Indicator 2 measures the effectiveness of protection systems in safeguarding system reliability.

## How it is measured

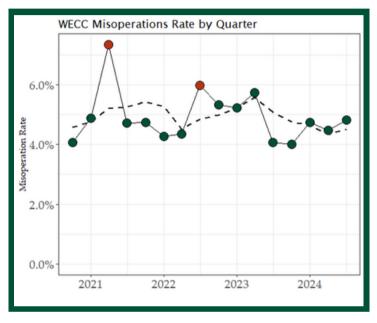
Indicator 2 tracks the ratio of protection system <u>misoperations</u> to the total number of protection system operations.

# Why this matters

System reliability is reduced when protection systems fail to operate, or they operate incorrectly ("misoperation"). Misoperations are a major contributor to transmission outage severity.



Indicator Performance History



# What does the Q3 2024 evaluation tell us?

There were 54 misoperations reported in Q3 2024 along with 1,125 misoperations resulting in a misoperations rate of 4.8%. The leading causes for misoperations in the third quarter of 2024 were Incorrect Settings (22), Relay Failures/Malfunctions (9), and Unknown Cause (6). Two of the Unknown Cause misoperations were failures to trip with a fault on the system. They are generally considered the most significant category of misoperations, and without a known cause and applied corrective action there is a higher likelihood of a repeat misoperation. The 4.8% misoperations rate is favorable, resulting in this indicator being green for the quarter.





#### What it measures

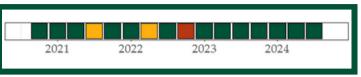
Indicator 3 measures how often potentially high-risk, unplanned transmission outages occur on the system.

#### How it is measured

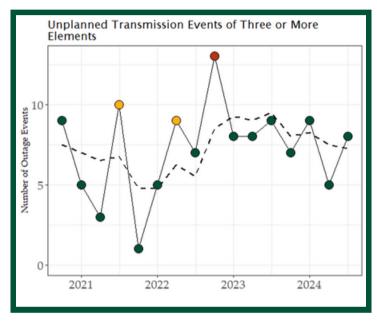
Indicator 3 tracks the number of unplanned transmission events involving three or more Bulk Electric System elements each quarter.

#### Why this matters

While most transmission events involve an outage of a single element, some events involve multiple elements. Though relatively uncommon, events involving three or more elements pose a higher risk because they are more extensive than the n-1 and n-2 contingencies typically considered by planners.



Indicator Performance History



#### What does the Q3 2024 evaluation tell us?

There were eight events involving three or more elements, which is only slightly above the running mean, so the indicator is green. The longest event involved three elements and lasted 23 hours. One event involved five elements but lasted for only 11 minutes.

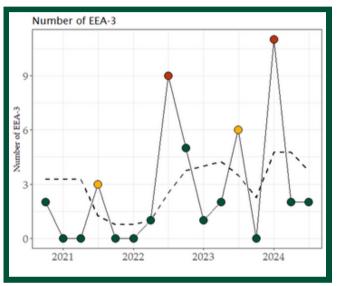


# Indicator 4: Number And Duration of Energy Emergency Alerts



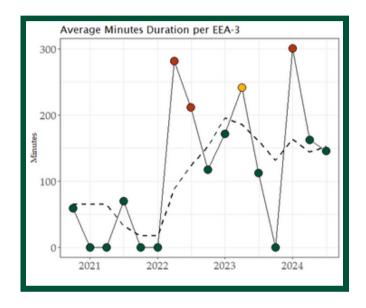
#### What it measures

Indicator 4 measures the number and duration of Level 3 Energy Emergency Alerts (EEA-3) issued to Balancing Authorities each quarter. An <u>EEA-3</u> alert is defined as a situation in which firm load interruption is imminent or in progress.





Combined Indicator Performance History



#### How it is measured

Indicator 4 is based on two metrics related to EEA-3 alerts:

- 1. The number of EEA-3 alerts issued each quarter.
- 2. The <u>mean duration</u> of the EEA-3 alerts issued each quarter.

# Why this matters

EEA-3 alerts can indicate a lack of sufficient bulk electric system generation capacity, energy, or transmission capability. EEA-3 alerts are an important indicator of system operational reliability.

# What does the Q3 2024 evaluation tell us?

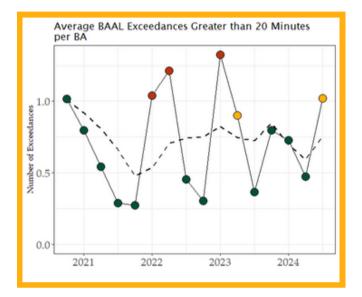
There were only two EEA-3 in Q3 2024, fewer than the rolling average over the past four quarters. The average duration of the Q3 EEA-3 slightly below that of the past four quarters as well. For these reasons, the indicator is "green."





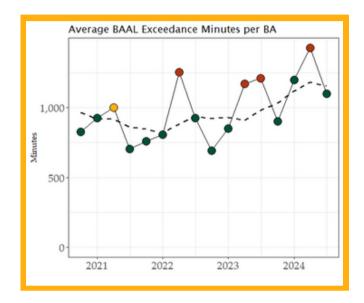
#### What it measures

Indicator 5 measures the system's ability to maintain frequency within defined limits.





**Combined Indicator Performance History** 



#### How it is measured

Indicator 5 is based on two metrics related to Real Power Balancing Control Performance:

- 1. The mean number of Balancing Authority Area Control Error (ACE) Limit (BAAL) exceedance minutes per BA each quarter.
- 2. The mean number of BAAL exceedances greater than 20 minutes per BA each quarter.

#### Why this matters

Operation within the BAAL supports reliability by maintaining system frequency within defined limits. Instances where the BAAL is exceeded may put the reliability of the interconnection at risk.

# What does the Q3 2024 evaluation tell us?

Only 11 BAs had any exceedances lasting more than 20 minutes, but two moderately sized BAs had 42 and 14 such events, respectively. Consequently, the average across all BAs was significantly greater than the rolling average of that metric. The average duration per BA was slightly below the rolling mean, but the combined result of these two metrics is that the indicator is "yellow."

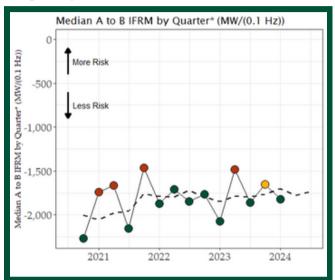


#### **DATA SOURCE** NERC IFR Master Event List (Redacted)

# Indicator 6: Interconnection Frequency Response and Performance

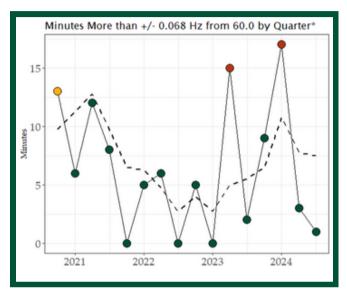
#### What it measures

Indicator 6 measures the system's ability to respond to changes in frequency and maintain 60 Hz frequency.



# 2021 2022 2023 2024

Combined Indicator Performance History



#### How it is measured

Indicator 6 is based on two characteristics of system frequency:

- 1. Frequency response to large disturbances—Frequency stability in response to events such as sudden generation or load loss, measured by NERC's A-B IFRM metric.
- 2. Frequency performance under normal frequency behavior—Frequency stability at all times, measured as the number of minutes with a mean frequency exceeding +/-0.068 Hz from 60 Hz.

#### Why this matters

Frequency should be kept as close to 60 Hertz as possible. When large disturbances occur, frequency should not deviate far from 60 Hertz and should be restored quickly. Maintaining frequency is a coordinated effort among BAs to balance generation and load. When one BA is unable to perform this balance, it can adversely impact the entire interconnection and, if not resolved, can lead to issues on the BPS that may include shedding firm load.

# What does the Q3 2024 evaluation tell us?

Beginning with Q1 2022, Indicator 6 has been modified to use the "operating calendar," rather than the "standard calendar." Per the operating calendar, December 2021 through February 2022 represents the first quarter of the 2022 operating year. This change will align Indicator 6 with the meeting, data availability, and reporting schedule of the NERC Resources Subcommittee (RS), which is the source of the IFRM data supporting this indicator. Other indicators will continue to use the standard calendar.

The number of frequency events (2) this quarter was not sufficient to evaluate frequency response. So, for this quarter, Indicator 6 will be based entirely on the system frequency measure and not on frequency response. The interconnection had only one instance when frequency declined past 0.068 Hz for one minute. Indicator 6 is green for the quarter and well below the mean.

