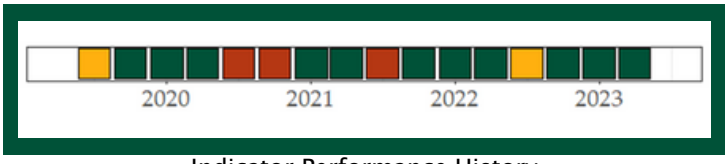
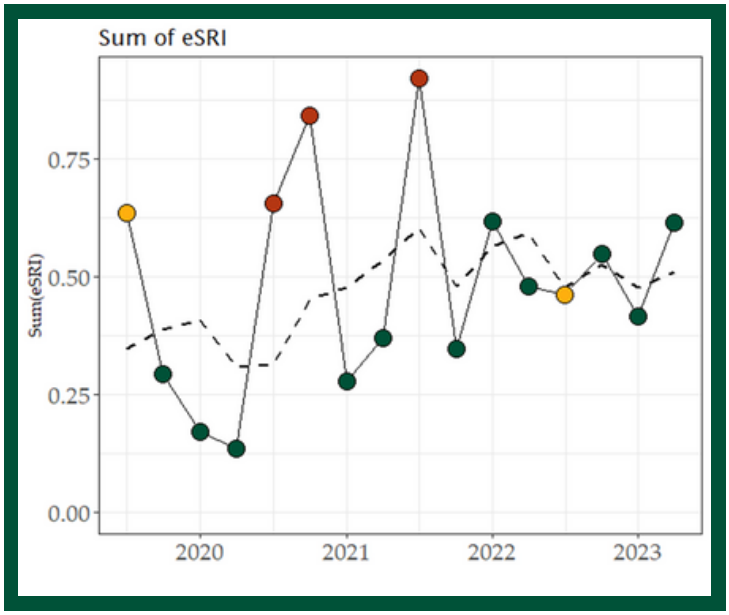
Indicator 1:
Number and Severity of Reported Events

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 NERC Event Analysis Process to track and evaluate events. The indicator measures only reported events evaluated through that process.



Indicator Performance History



How it is measured

Indicator 1 is based on two characteristics of reported events:

1. Sum of the Event Severity Risk Index (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 Q2 2023 evaluation tell us?

There were 11 categorized events in the Western Interconnection in Q2 of 2023. Nine of these events were Category 1a, one was a Category 1h and the remaining event was a Category 1i. No events of Category 2 or higher occurred.

Of these 11 events, three included an impact to customer loads, while six also affected generation resources. The eSRI for the quarter rose above the yearly average with over a third of the indicator metric being driven by two of the events. This indicator remains in a green status.

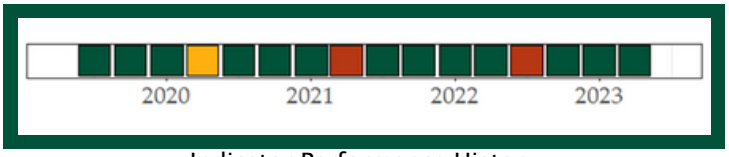
DATA SOURCE

The Event Analysis Management System
NERC eSRI metric

Indicator 2:
Rate of Protection System Misoperations

What it measures

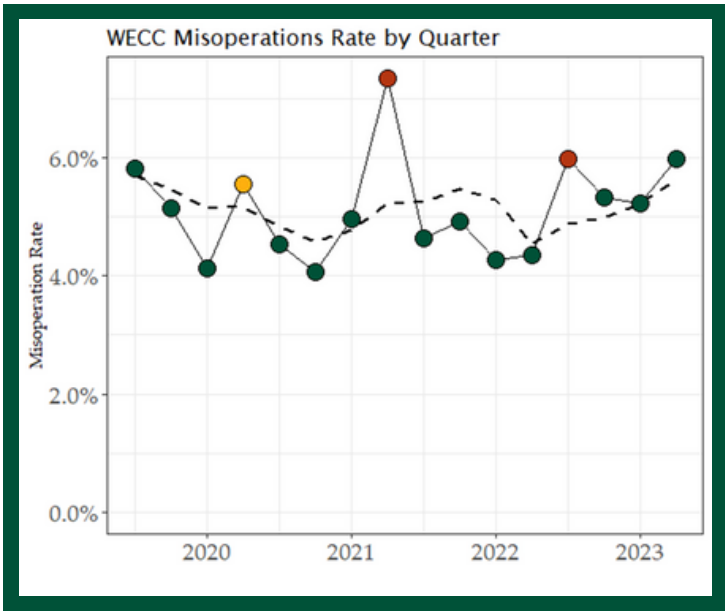
Indicator 2 measures the effectiveness of protection systems in safeguarding system reliability.



Indicator Performance History

How it is measured

Indicator 2 tracks the ratio of protection system misoperations 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.

What does the Q2 2023 evaluation tell us?

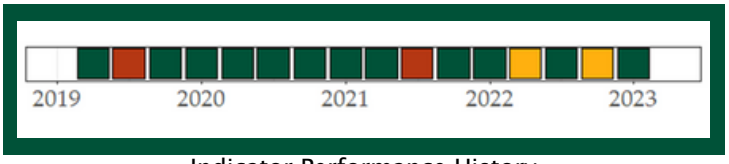
In Q2 2023, entities in the Western Interconnection reported 66 misoperations and 1120 operations for a rate of 5.9%. There were a few items that stood out for this data for this quarter. There were 17 misoperations caused by relay failure/malfunction in Q2 2023. This is more than double the average per quarter (8) for the last five years for this cause. Another item that stood out for Q2 is that 12% of the misoperations for the quarter were categorized as either slow to trip or failure to trip misoperations. These are generally considered more severe misoperations as fault conditions remain on the system longer and additional facilities are removed from service to clear the fault. While not reflected by the misoperations rate, this is not a favorable observation that WECC and the Protection and Control Subcommittee will look into further. Notwithstanding these observations, the metric for Q2 2023 remains green.

DATA SOURCE
Misoperation Information Data Analysis System (MIDAS)

Indicator 3: Unplanned Outages of Multiple Transmission Elements

What it measures

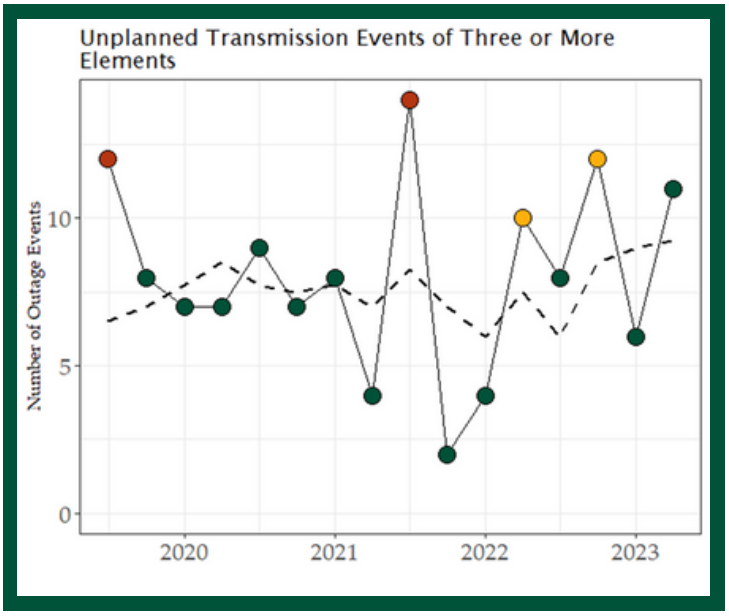
Indicator 3 measures how often potentially high-risk, unplanned transmission outages occur on the system.



Indicator Performance History

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.

What does the Q2 2023 evaluation tell us?

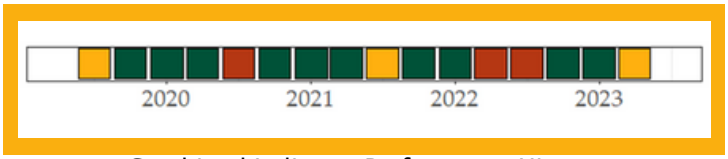
There were 11 unplanned transmission events involving three or more elements in Q2 of 2023, which is marginally higher than the moving average, classifying the quarter as "green." Six of these events lasted one hour or less, four events lasted less than five hours, and one element remaining out of service for more than five hours.

DATA SOURCE
Transmission Availability Data System (TADS)

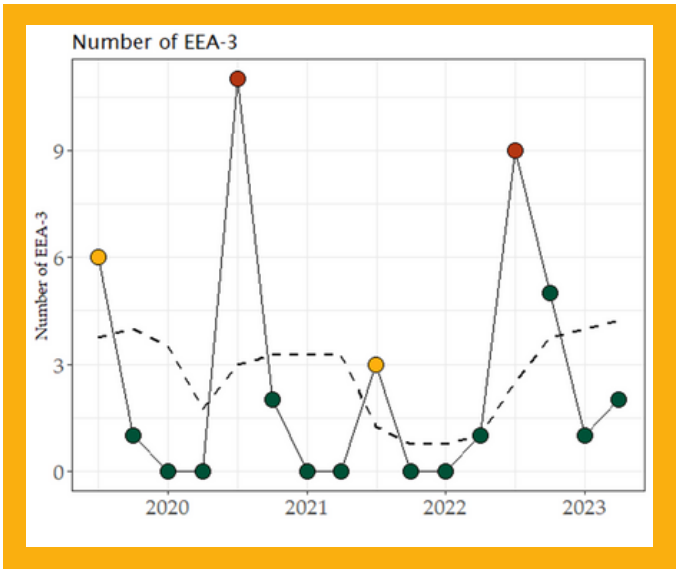
Indicator 4: Number And Duration of Energy Emergency Alerts

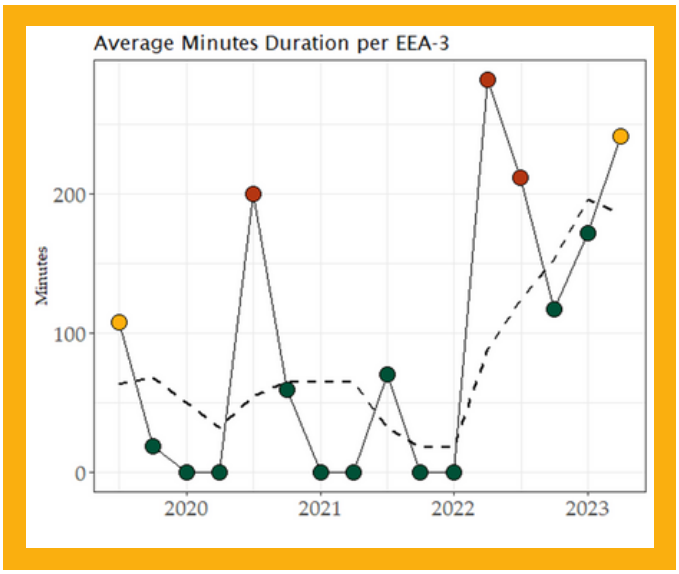
What it measures

Indicator 4 measures the number and duration of Level 3 Energy Emergency Alerts (EEA-3) issued to Balancing Authorities each quarter. An EEA-3 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 mean duration 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 Q2 2023 evaluation tell us?

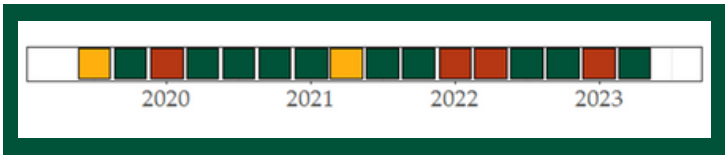
In the second quarter of 2023, two BA's had one EEA-3 event each, an increase of one from Q1. An event in June lasted abnormally long due to high demand because of hot temperatures and low wind, combined with an unplanned generator outage resulting from a condenser leak. Demand stayed high until the late evening as temperatures remained well above normal for the area. This indicator is yellow due mainly to the length of one EEA-3 event.

DATA SOURCE
NERC System Awareness

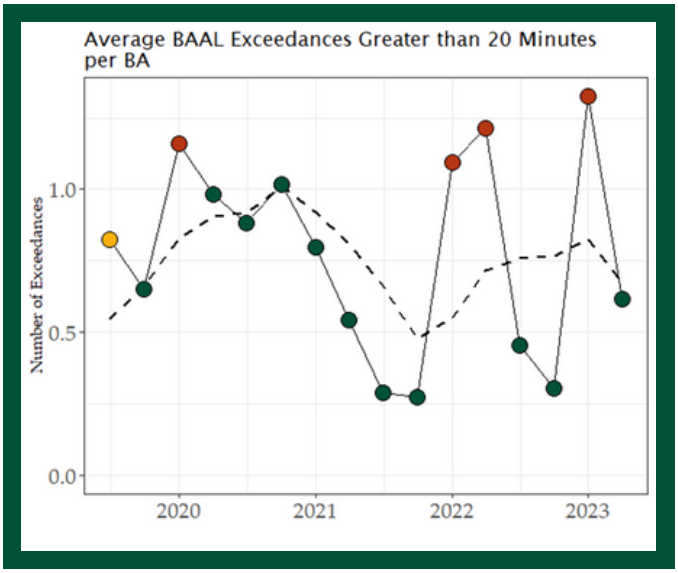
Indicator 5: System Operation Outside Balancing Authority ACE Limit (BAAL)

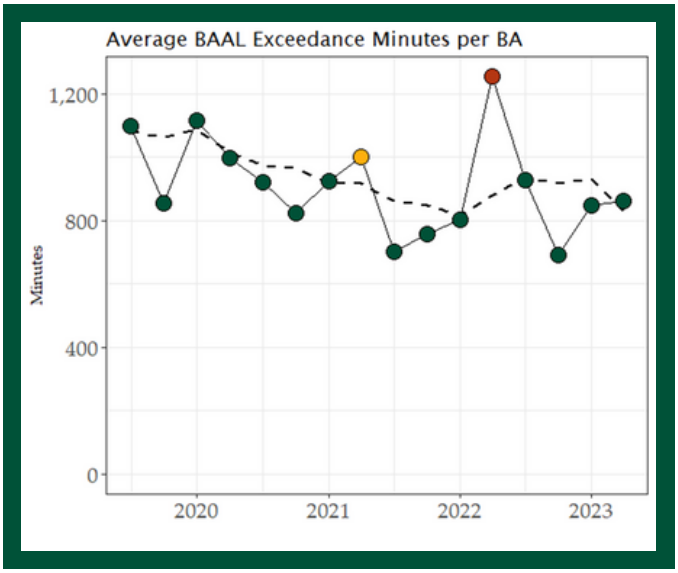
What it measures

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 Q2 2023 evaluation tell us?

The weighted average number of BAAL exceedances greater than 20 minutes declined sharply from Q1, close to the mean for the past three years. The average duration of all exceedances, across all BA's remained at a low level. Both metrics indicate that BAs overall did an excellent job of managing their ACE during the quarter. Outreach to BA's who struggled in Q1, made a difference in Q2 performance. This indicator is green for the quarter.

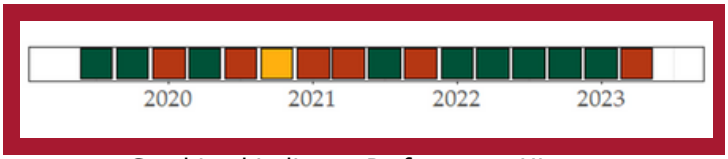
DATA SOURCE

NERC BA Submission Site (BASS)

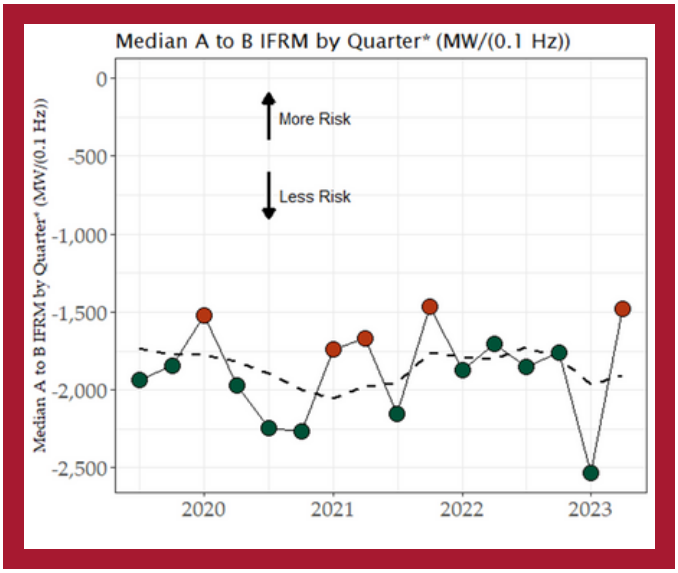
Indicator 6: Interconnection Frequency Response and Performance

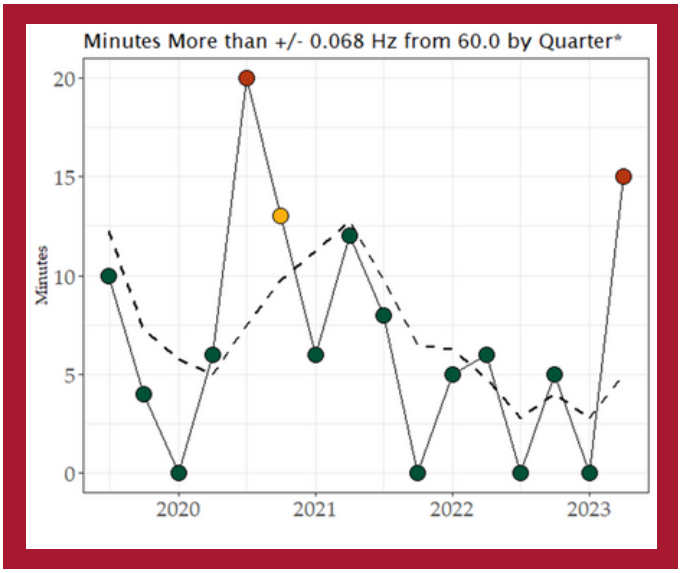
What it measures

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



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 Q2 2023 evaluation tell us?

The magnitude of the Median A-to-B IFRM declined significantly in Q2, down over -1000 MW. This was due mainly to two small generation events having poor A-B response: one hydro event (four units totaling 436 MW), and one solar plant event (46 MW)

Nine frequency intervals were observed during which system frequency was more than +/-0.068 from 60.0 Hz for at least one minute in Q2. Of the nine intervals, most were measured at 1 minute with a couple at 4-5 minutes. This may not be the best way to measure a problem with response. A better measure to consider would be events that last 15 minutes or longer with frequency staying at 0.068 Hz below 60.0 Hz. Because both metrics are red, the indicator for Q2 is red.

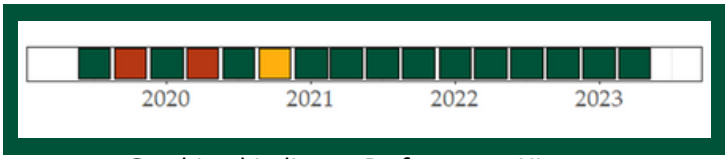
DATA SOURCE

NERC IFR Master Event List (Redacted)

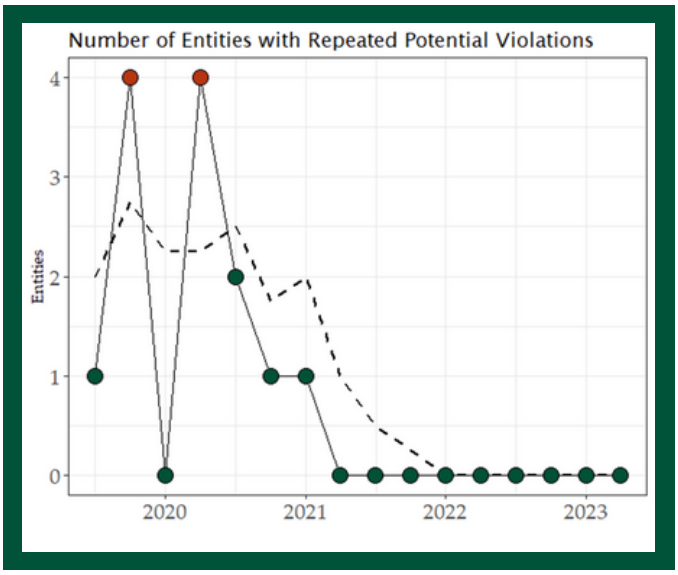
Indicator 7: Proportion of Entities With Repeated or Coincident Potential Compliance Violations

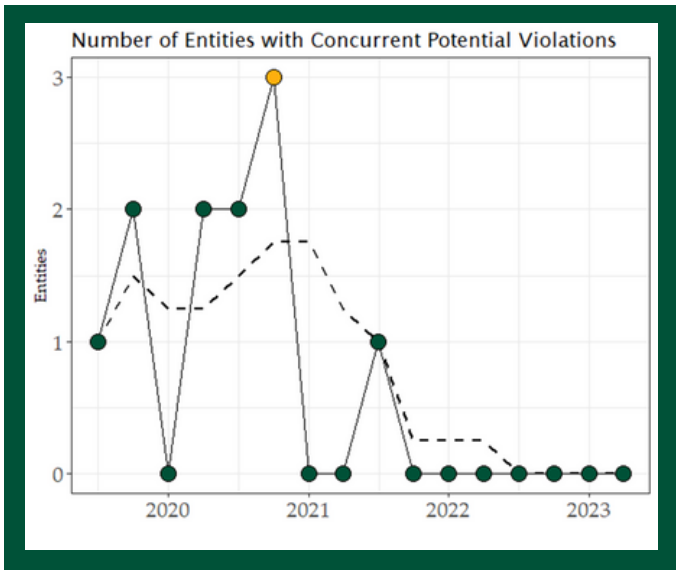
What it measures

Indicator 7 measures aspects of entity compliance behavior related to multiple potential violations.



Combined Indicator Performance History





How it is measured

Indicator 7 is based on two metrics:

1. Number of entities with repeat serious or moderate potential violations of the same standard and requirement within a five-year period.
2. Number of entities with three or more concurrent serious or moderate potential violations within a standard family issued during a given quarter.

Why this matters

Repeated or concurrent serious or moderate potential violations can be indicators of systemic or programmatic issues within the entity.

What does the Q2 2023 evaluation tell us?

The number of entities with repeated or concurrent potential violations was zero for Q2 of 2023. Consequently, this indicator is classified as "green." This indicator will be discontinued in the Reliability and Security dashboard because the topic is better addressed in the Oversight Quarterly Trends document.

DATA SOURCE
webCDMS/Align

Indicator 8:
Rate of Detected Malicious Threats

Under Development

Indicator 8 is currently under development and will focus on reported cyber and physical threats to the Western Interconnection. WECC currently receives notification of these threats through the EOP-004-2 and OE-417 reporting process; however, these reports may not reflect the full spectrum of the threats. Consequently, WECC does not currently have adequate data to develop an accurate indicator for physical and cyber security. WECC is working with other organizations (ex., NERC, E-ISAC) to determine potential datasets for this indicator that can provide a broader and more complete assessment.