

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.

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.*

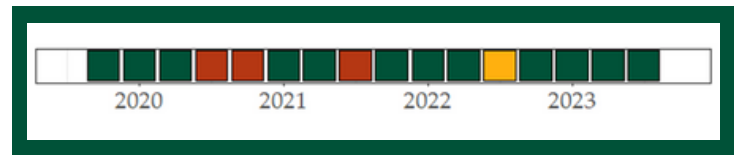
*Category 2 and higher events are rare, typically fewer than one per year. One Category 2 event occurred in Q3 2022.

Why this matters

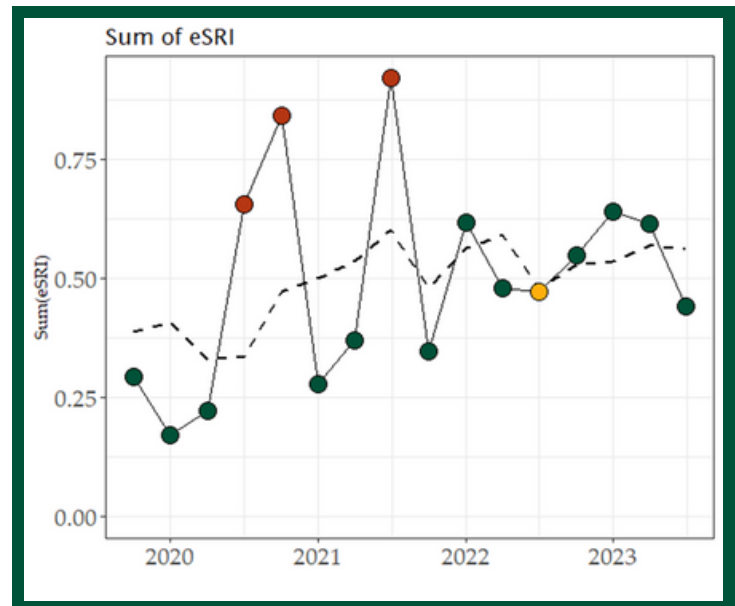
Events pose a risk to system reliability. Category 2 or higher events are more significant events that have severe impacts on the system.

What does the Q3 2023 evaluation tell us?

There were nine categorized events in the Western Interconnection in Q3 of 2023. All these events were Category 1 events. Five were Category 1a events, one was Category 1c, two were Category 1h, and one was Category 1i. Of these events, two impacted customer loads, while five events impacted generation. The eSRI for the quarter is below the moving average for the year and is the lowest since the third quarter of 2021.



Indicator Performance History



DATA SOURCE

The Event Analysis Management System
NERC eSRI metric



Indicator 3: Unplanned Outages of Multiple Transmission Elements



What it measures

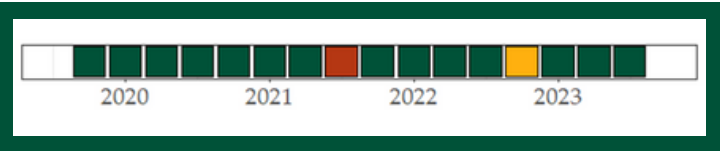
Indicator 3 measures how often potentially high-risk, unplanned transmission outages occur on the system.

How it is measured

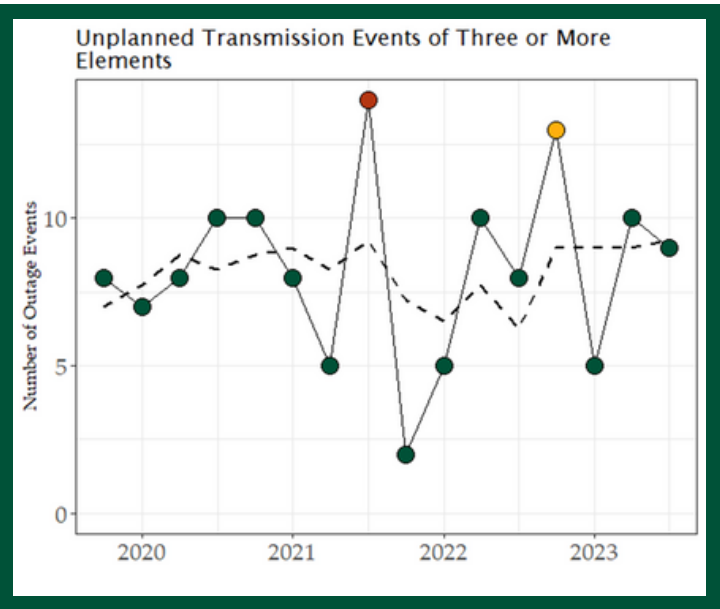
Indicator 3 tracks the number of unplanned transmission events involving three or more Bulk Electric System elements each quarter.

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 2023 evaluation tell us?

There were nine unplanned transmission events involving three or more elements in Q3 of 2023, which trends with the moving average, classifying the quarter as “green.” Five of these events lasted one hour or less, two events lasted less than eight hours, and two events resulted in elements remaining out of service for longer than eight hours.

DATA SOURCE

Transmission Availability
Data System (TADS)

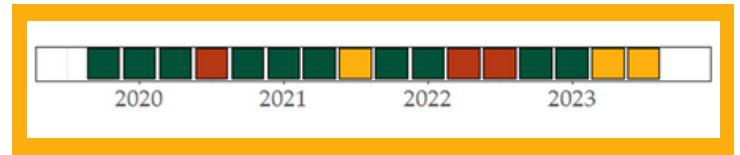


Indicator 4: Number And Duration of Energy Emergency Alerts

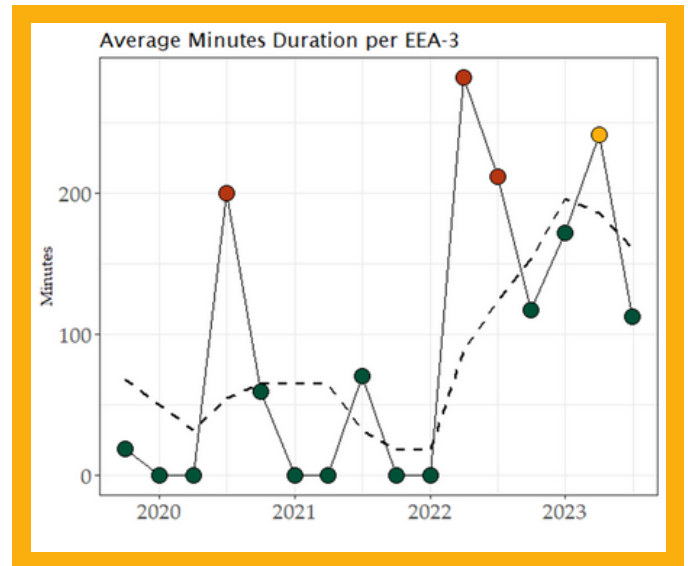
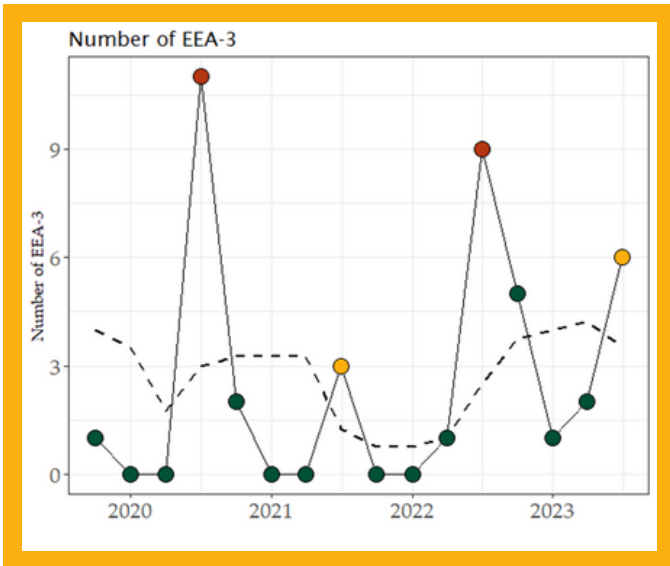


What it measures

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 Q3 2023 evaluation tell us?

Two BAs evenly contributed to the six EEA-3 events in Q3. Large Generation losses for one of the BAs led directly to its inability to maintain Contingency Reserve requirements resulting in the Energy Emergencies. For the other BA, a combination of high temperatures, heavy demand, low wind generation, transmission and generation outages, and declining solar generation during the evening ramp resulted in EEAs. On a positive note, the average duration for the time BAs were in an EEA-3 went down significantly during the quarter.

DATA SOURCE

NERC System Awareness

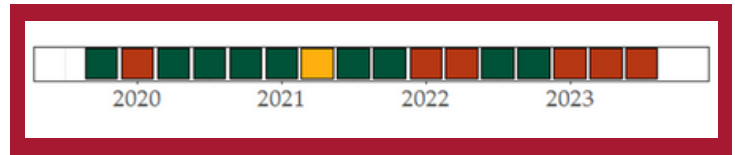


Indicator 5: System Operation Outside Balancing Authority ACE Limit (BAAL)

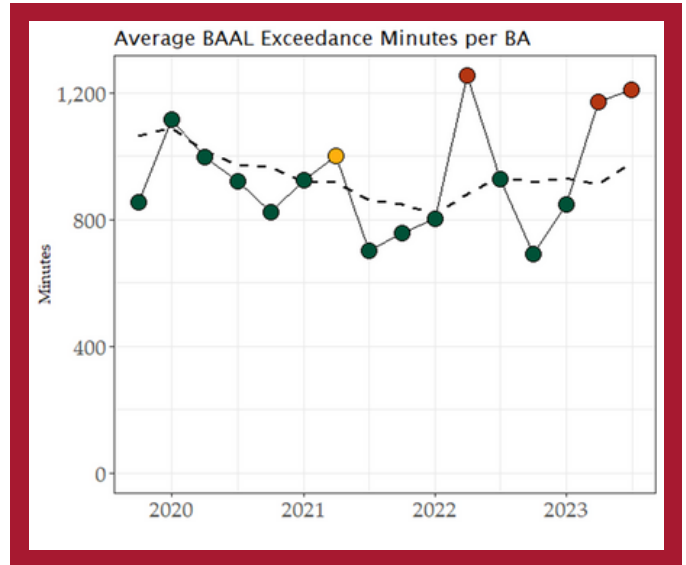
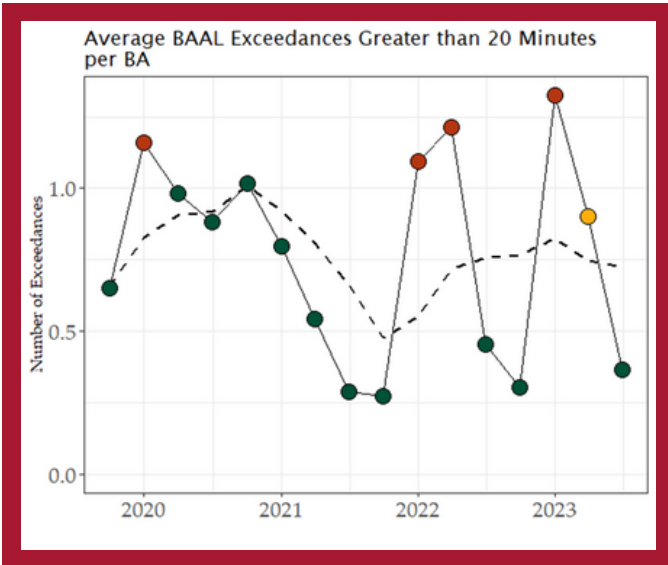


What it measures

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 Q3 2023 evaluation tell us?

A BAAL minute is defined as a one-minute CPS1 value calculated at the BA level which is more negative than -700%. This metric is an indication of a BA struggling to balance its load and resources during that one-minute period. The average BAAL Exceedance Minutes per Western Interconnection BA, historically, fluctuates greatly based upon the season. The metric "Average BAAL Exceedance Greater than 20 Minutes per BA" has remained relatively stable when compared to similar past seasonal periods. The metric "Average BAAL Exceedance Minutes per BA" is trending up in recent quarters compared to previous quarters of the like season. WECC will be monitoring this trend.

DATA SOURCE

NERC BA Submission Site (BASS)

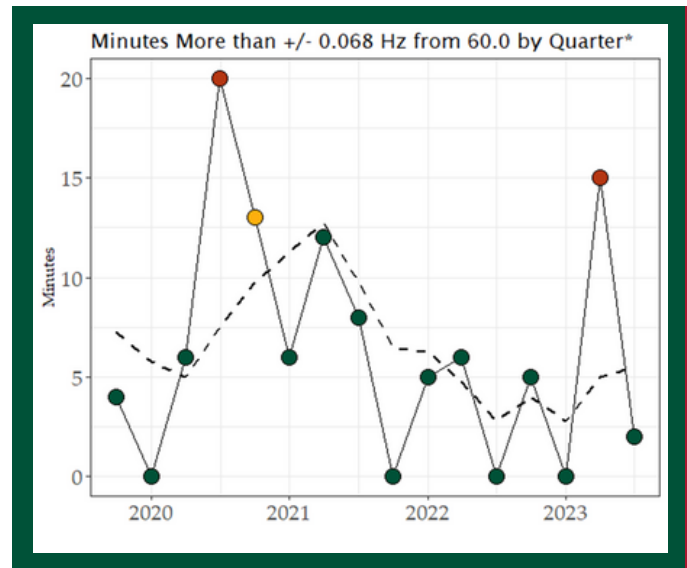
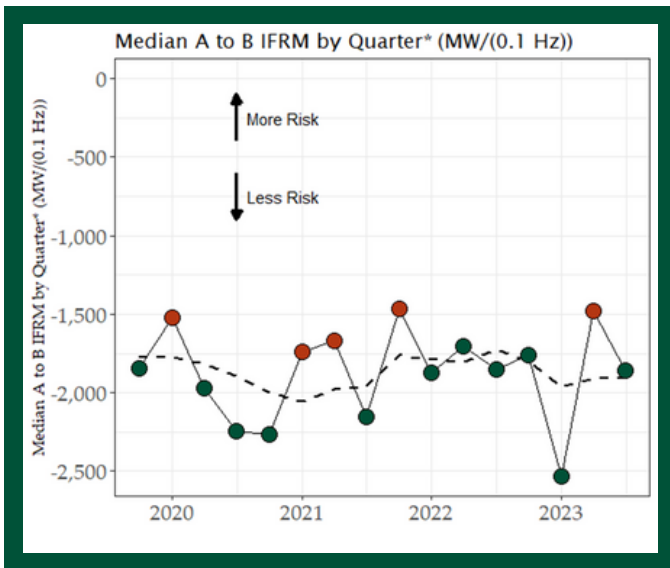
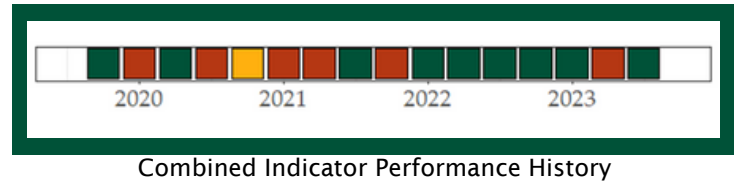


Indicator 6: Interconnection Frequency Response and Performance



What it measures

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



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 2023 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.

Metrics for Indicator 6 are green, indicating the Western Interconnection frequency response for all measured events was acceptable.

DATA SOURCE

NERC IFR Master Event List (Redacted)

