

Reliability and Security Indicator Dashboard

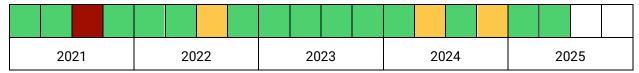
QUARTER 2 - 2025

Index

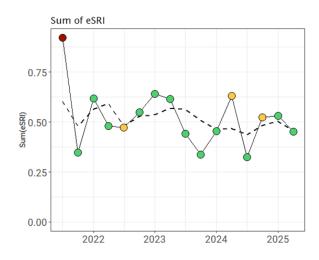
| <u>Indicator 1</u> | |
|---------------------------------|---|
| Reportable Events | 1 |
| Indicator 2 | |
| Protection System Misoperations | 2 |
| Indicator 3 | |
| Transmission Outages | 3 |
| Indicator 4 | |
| Energy Emergency Alerts | 4 |
| Indicator 5 | |
| Operation Outside BAAL | 5 |
| Indicator 6 | |
| System Frequency | 6 |



Indicator 1 Performance History-by Year and Quarter



Trend Charts



Quarterly Evaluation

There were seven categorized events in the Western Interconnection in Q2 of 2025. Four of these events were category 1a events, one each was category 1c, 1h, and 1i.

Of these seven events, five resulted in transmission lines tripping out of service, five affected generation resources, but none of the events affected customer loads.

One of the events had no impact on the score based on the metrics measured.

The eSRI sum for the quarter is lower than Q1 of 2025 due mainly to the absence of events, which resulted in loss of load decreasing the overall impact to the power system.

Comparing this quarter to the historical combined impact of events on the power system, the metric is in line with the rolling average and remains in the typical and good condition indicator criteria.

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:

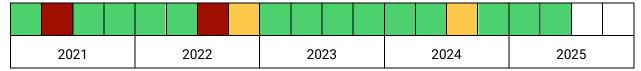
- 1. Sum of the <u>Event Severity Risk</u> <u>Index</u> (eSRI) number for each event every quarter.
- 2. Number of Category 2 and higher events each quarter.*

Why this matters

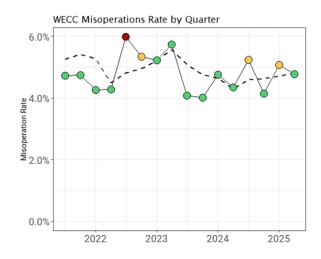
Events pose a risk to system reliability. Category 2 or higher events are more significant events that have severe impacts on the system.

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

Indicator 2 Performance History-by Year and Quarter



Trend Charts



Quarterly Evaluation

There were 41 misoperations reported in Q2 2025 along with 860 operations resulting in a misoperations rate of 4.8%. The leading causes for misoperations in the first quarter of 2025 were Incorrect Settings(20), Other/Explainable (6), and Relay Failures/Malfunctions (5). While Incorrect Settings are historically the highest contributor to misoperations, there was a higher percentage in Q1 of 2025 (49%) than the contribution to total misoperations in 2024 of 40%. There was one Failure to Trip misoperation that took place during a fault. This allows the fault condition to be left on the system longer than designed, and requires remote protection to clear the fault. This is an unfavorable condition. There was also one Slow to Trip misoperations, but this took place without a fault on the system. All other faults were unnecessary trips, which are generally less impactful to the system. The 4.8% misoperations rate is favorable, resulting in this indicator being green for the quarter.

What it measures

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

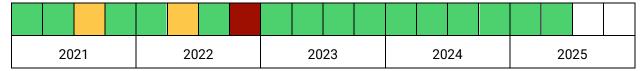
How it is measured

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

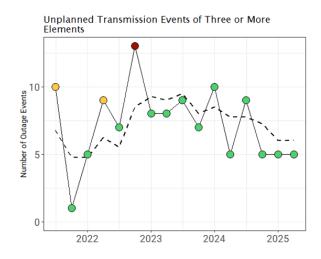
Why this matters

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 3 Performance History—by Year and Quarter



Trend Charts



Quarterly Evaluation

In the second quarter of 2025, there were five events with three or more outages. One of these events had a duration of 133 hours. The remaining events had durations of five hours or less. The total number of events is below the mean number of events per quarter, so this indicator is green.

What it measures

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

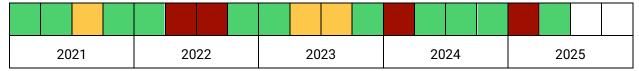
How it is measured

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

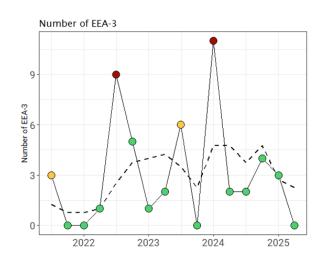
Why this matters

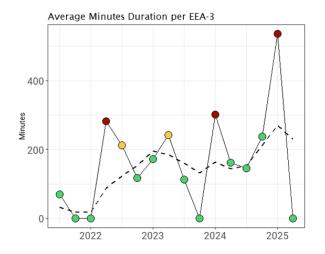
While most transmission events involve an outage of a single element, some events involve multiple elements. Though relatively uncommon, events involving three or more elements pose a higher risk because they are more extensive than the n-1 and n-2 contingencies typically considered by planners.

Indicator 4 Performance History—by Year and Quarter



Trend Charts





Quarterly Evaluation

WECC had zero BAs placed into an EEA-3 during the quarter. In May, RC West did place a BA into an EEA-1 due to a unit de-rate that caused the BA to be concerned about its ability to maintain reserves in the hours ahead. The BA was able to complete repairs and return the unit to service without any other concerns. Therefore, the indicator is green for Q2.

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.

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.

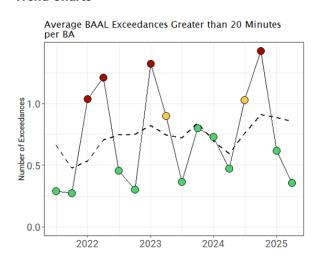
Why this matters

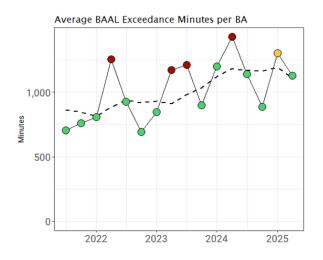
EEA-3 alerts can indicate a lack of sufficient bulk electric system generation capacity, energy, or transmission capability. EEA-3 alerts are an important indicator of system operational reliability.

Indicator 5 Performance History—by Year and Quarter



Trend Charts





Quarterly Evaluation

Fewer 20-minute exceedances than any recent quarter, and an average number of exceedance minutes, means that the indicator is green.

What it measures

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

How it is measured

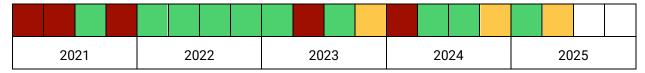
Indicator 5 is based on two metrics related to Real Power Balancing Control Performance:

- 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.

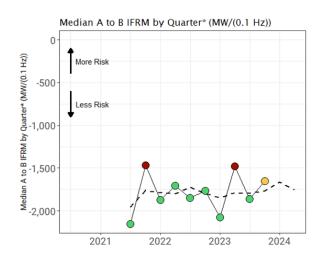
Why this matters

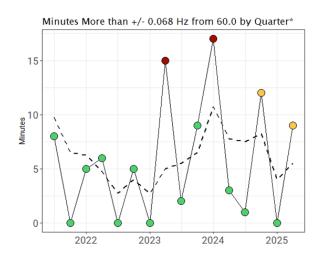
Operation within the BAAL supports reliability by maintaining system frequency within defined limits. Instances where the BAAL is exceeded may put the reliability of the interconnection at risk.

Indicator 6 Performance History—by Year and Quarter



Trend Charts





Quarterly Evaluation

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.

SystUse of the IFRM metric has been suspended due to insufficient measurement events. Therefore, Indicator 6 is currently based entirely on frequency performance.

With nine minutes in which the mean frequency was more than 0.68 mHz below 60 Hz, Q2 has significantly more than the recent average. Consequently, this indicator is yellow.

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.