How to Navigate the Reliability & Security Indicator Dashboard

July 2025

The dashboard provides an overview of the status of WECC's Reliability and Security Indicators. The webpage is set up to allow for easy navigation between its various components, which includes the main landing page, the quarterly indicator report, and a technical appendix.

The indicator colors have the following meaning:

- GREEN: Conditions are typical and good
- YELLOW: Conditions are somewhat unusual and may be of some concern
- RED: Unusual conditions that may be a more serious concern

About the Reliability and Security Indicators

WECC's Reliability and Security Indicators replace the former Reliability and Security Index and represent a first step toward improving how WECC measures the health of the Bulk Power System. It is expected that these indicators will be enhanced over time. They will be reviewed on a regular basis to make improvements wherever possible. WECC's Reliability and Security Indicators are updated each quarter to reflect new data received. As new data is validated and analyzed each quarter, the colors, data diagrams, and indicator analysis assessments for each indicator are updated in the dashboard. These quarterly updates occur roughly three weeks prior to each quarterly WECC Board of Directors meeting. The Reliability and Security Indicators are based on several datasets, some of which are available relatively quickly, and one of which is not stable until more than 75 days after the end of each quarter. The indicators cover the same time period for clarity. Otherwise, the dashboard would confusingly display the status of different indicators for different quarters. While the indicators are updated, reviewed, analyzed, and approved as promptly as possible, data timing constraints require that the indicators lag by roughly two quarters. For example, the indicator update that occurs in Q1 of 2025 reflects new data for Q3 of 2024.

About the Dashboard Webpage

The Reliability and Security Indicator Dashboard webpage consists of the main landing page, accordions dashboard documents (including this overview and a technical appendix), the current quarterly evaluation and an archive.

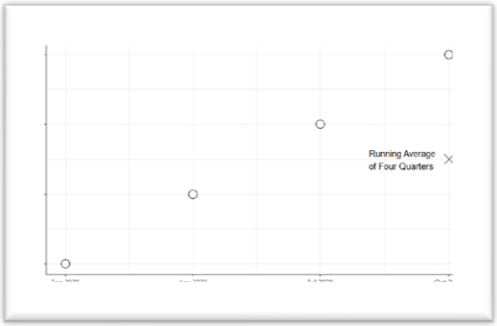
The main landing page shows each Reliability and Security Indicator as a colored icon.. Note that WECC analyzes performance trends for all indicators regardless of their color for a given quarter. More detailed information on how the colors are determined is included below in the "About the Colors–Statistical Details" section below. Most of the indicator write-ups include hyperlinks to a technical appendix which contains more detailed or technical information for that indicator. When clicking on the hyperlinks on the indicator page, it is recommended to right click on the hyperlink and "open link in new tab." The technical appendix also contains hyperlinks to external websites or public documents that can be referenced for more specifics and background information.

About the Indicator Pages

The indicator pages were designed to have the same look and feel throughout. Each page contains the following from top to bottom:

1. A colored icon indicating the color for that indicator for that quarter.
2. An Indicator Performance History box that shows how that indicator has performed over time. This is useful because some indicators contain two metrics.[1]
3. A chart showing the data for the metrics associated with the indicator. Each indicator will contain either one or two metrics.
4. “Quarterly Evaluation” section.
5. “What it measures” section.
6. “How it is measured” section.
7. “Why it Matters” section.

Each data chart contains a dashed line, which is the running average of the four quarters up to and including the most recent quarter. For example, if the value of some metric was 1, 2, 3, and 4 for the four quarters of 2020, the value of the running average at Q4 would be 2.5, (the average of those four numbers). This is illustrated in the figure below.

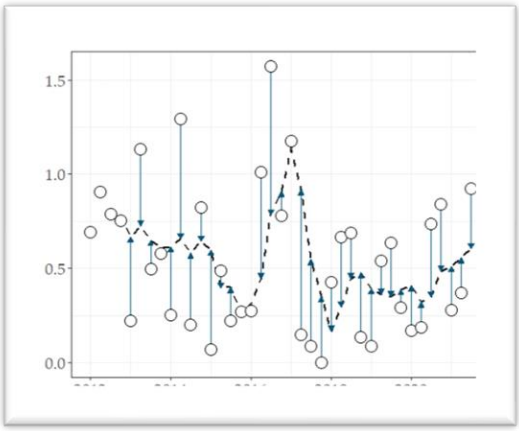


About the Colors–Statistical Details

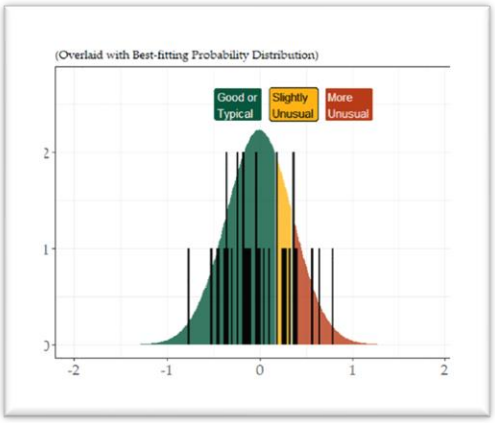
This section describes the method used for determining the colors of the indicators. Status colors have been assigned for each of the indicators using identical logic, as illustrated below for one example dataset, (Indicator 1). Using identical logic for all the indicators accomplishes two important objectives. First, it puts all the indicators on a common basis so that "red" means the same thing for one indicator that it means for another. Second, readers need only familiarize themselves with one set of logical steps, (as opposed to different logic for each indicator). The next sections describe the steps taken to determine the color for each indicator.

[1] When an indicator is based on more than one metric, it reflects the worst of the metrics for that indicator. For example, Indicator 3 is based on the number of EEA-3s and the average duration of EEA-3s in minutes. If either of those metrics is set to red, the combined Indicator 3 will be set to red. This conservative approach highlights areas of possible concern whenever they arise, rather than allowing the green status of one metric to mask the yellow or red status of another.

Step 1: Calculate the difference between each quarterly point and the running average. As described above, each chart contains a dashed line indicating a running one-year average. The first step in the process is to determine how far away each data point is from the running average. The differences between each data point (a dot) and the running average are indicated with blue arrows. Some dots are very close to the running average, and others are further away. From the diagram below, observe that the values of the distances between the dot and the dashed line can range anywhere from almost zero to +/- 0.8.



Step 2: Determine typical differences based on history. The differences between the dots and the dashed line are then arranged in histogram bins along a line from the most negative differences to the most positive differences. Once those differences are arranged on a plot, the goal is to find the probability distribution that best fits the distribution of those differences. In this example, we can see that differences near zero, (where the probability distribution is highest), are most common, while differences far away from zero, (where the probability distribution is very low), are less common.



Step 3: Assign colors based on how typical or atypical each difference is. Once the best-fitting probability density function is determined, the next step is to apply thresholds to determine how the data from each quarter fits into the color categories. In this example, data heading in the right direction indicates worse performance, and data heading in the left direction indicates better performance.

Statistical thresholds are used to determine the data that falls into the green, yellow, and red categories. These thresholds are designed such that approximately 70 percent of the differences are considered green, 15 percent are considered yellow, and the worst 15 percent are considered "red."

From a statistical perspective, the green category is defined as anything less than ½ of a standard deviation above the average, the yellow category is defined as anything between ½ standard deviation and 1 standard deviation above the average, and the red category is defined as anything greater than 1 standard deviation above the average. Once the data is fitted into the probability density function and categorized into the appropriate color, the dots are then arranged on the metric chart with the appropriate color. The diagram below shows the results from applying this process. In this example, the newest data point is considered yellow. More information about statistical distributions and standard deviations can be found on Wikipedia.