This technical appendix provides supplemental information about definitions of the metrics and indicators.

Indicator 1: Number and severity of reported events

A reported event is any event defined by the NERC Event Analysis Process. This indicator measures only events that are Category 2 or higher.

The Event Severity Risk Index (eSRI) is a method of tracking the severity of reported events. The North American Electric Reliability Corporation (NERC) calculates an eSRI score for every reported event based on the loss of load, loss of transmission, and loss of generation. These values are summed and reported on a quarterly basis.

Indicator 2: Rate of protection system misoperations

Annual misoperation rates for the Western Interconnection are also available in the WECC Relay Work Group Annual Report.

Indicator 4: Number and duration of Energy Emergency Alerts

Energy Emergency Alert Mean Duration Metric

For the purpose of computing the rolling mean duration for quarters in which there were no EEA-3 alerts, a duration value of 0 minutes was used.

Indicator 5: Trend in system operation outside Balancing Authority ACE Limit (BAAL)

For more information on operations within BAAL limits, see Real Power Balancing Control Performance. BAAL information is reported monthly for each BA. In each case, the mean is calculated by assigning a larger weight to large BAs than small BAs based on the 2021 minimum frequency bias setting of each BA.

Indicator 6: Trend in interconnection frequency response and performance

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 interconnection frequency response measure (IFRM) data supporting this indicator. Other indicators will continue to use the standard calendar.

Frequency Response Metric

Sudden loss of generation creates a "frequency event" in which system frequency momentarily drops before restoration. The general pattern for generation loss events is described in Figure I.1 of the [2020 Frequency Response Annual Analysis](). The "A" value represents the starting frequency before an event, while "B" represents the frequency during the stabilizing period. "A" and "B" values for each frequency event are specified by subject-matter experts on the NERC Resources Subcommittee.

The IFRM for any one event is

$$IFRM_{A-B} = \frac{MW\ Loss}{10 * \Delta f_{A-B}}$$

as shown in the [NERC BAL-003 Informational Filing](). Each quarterly value is the median of IFRM for generation loss frequency events in that quarter, (where the number of frequency events each quarter may be as few as zero, or more than a dozen). The IFRM following a generation loss is a negative number. The more negative the number the better the performance, i.e., negative numbers closer to zero represent worse performance and a potential issue with the Interconnection's ability to arrest frequency deviations and recover.

Frequency Performance Metric

The dataset supporting the frequency performance metric currently only begins with the third quarter of 2018 but will be extended backwards if additional data becomes available.

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Indicator 7: Proportion of entities with repeated or coincident possible compliance violations

Repeated Violation Metric

Repeated potential violations are calculated based on entities having a repeat potential violation of a specific standard and requirement within a five-year period. Repeated potential violations may be caused by an entity performing the same action repeatedly, or by different actions that violate the same requirement. An entity with multiple repeat potential violations in a quarter is counted as one entity with repeated violations for that quarter.

Concurrent Violation Metric

Concurrent violations are calculated based on entities with three or more concurrent Operations and Planning (O&P) violations, *or* three or more Critical Infrastructure Protection (CIP) violations reported or found within each quarter. An entity with three or more O&P violations *and* three or more CIP violations is counted as one entity with concurrent violations for that quarter.

Indicator 8: Rate of detected malicious threats

Indicator 8 is under development.