**Dashboards are for example only and will be updated based on quarterly results**
Reliability Indicator 1: Fewer, Less Severe Events

- Why is it important?
  - Measures risk to the bulk power system (BPS) from events on the Bulk Electric System (BES)

- How is it measured?
  - Cumulative eSRI line in the composite daily event Severity Risk Index (eSRI) for Category 1–3 events (see pages 2-3 of ERO Event Analysis Process for category determination)

<table>
<thead>
<tr>
<th>Data (Annual Measurement)</th>
<th>2020 Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold: No Category 3 or above events: Zero is green, else is red</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data (Compared to a 5-year rolling average)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope of eSRI line is flat to decreasing and does not show an increase above zero that is statistically significant (95% Confidence Interval).</td>
<td></td>
</tr>
<tr>
<td>“2020 Status” relates to the slope of the 5-year rolling average (Positive, Flat or Negative), not just the 2020 performance.</td>
<td></td>
</tr>
</tbody>
</table>
Reliability Indicator 2: Compliance Violations

• Why is it important?
  ▪ Reduce risk to BPS reliability from Standard violations by registered entities

• How is it measured?
  ▪ Compliance History* of with moderate/serious risk noncompliance
  ▪ The number of violations discovered through self-reports, audits, etc.
  ▪ Risk to the BPS based on the severity of Standard violations

<table>
<thead>
<tr>
<th>Data (Annual Measurement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate and serious risk repeat violations filed with FERC on organizations that have Compliance History (based on 2017 metric)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2020 Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
</tr>
<tr>
<td>45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data (Annual Measurement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of noncompliance self-reported (Self-certified noncompliance is not included) (same as 2018 metric)</td>
</tr>
</tbody>
</table>

| 75% |
| 80% |

<table>
<thead>
<tr>
<th>Data (Compared to a 3-year rolling average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of serious risk violations resolved compared to the total noncompliance resolved (based on 2018 metric)</td>
</tr>
</tbody>
</table>

| 5% |
| 4% |

* To measure the effectiveness of the risk-based CMEP in reducing noncompliance, NERC reviews moderate and serious risk violations and includes them in one of three categories: 1) noncompliance with no prior compliance history; 2) noncompliance with prior compliance history that does not involve similar conduct; and 3) noncompliance with compliance history that includes similar conduct.
Reliability Indicator 3: Protection System Misoperations Rate

- Why is it important?
  - Protection system misoperations exacerbate the impacts

- How is it measured?
  - Annual Misoperations rate and the annual loss of load for events with misoperations

Data (Year-Over-Year Comparison)
- Q3-Q2 comparison misoperations rate based on collection interval (95% Confidence Interval) (Based on 2018 Metric)

2020 Status
- 7.5%
- 7.0%

Data (Year-Over-Year Comparison)
- Q3-Q2 comparison for qualified events with misoperations and loss of load (load loss/number of events) during the collection interval (95% Confidence Interval)

No Change
- +MW/event
- -MW/event
## RI 4: Events Caused by Gas-Fired Unit Forced Outages Due to Cold Weather or Gas Unavailability

### Why is it important?
- Reduce risk to BPS reliability due to gas-fired unit outages during cold weather or gas unavailability

### How is it measured?
- Firm load loss due to cold weather or gas unavailability
- MWh of potential production lost initiated by cold weather and gas unavailability

<table>
<thead>
<tr>
<th>Data (Annual Measurement)</th>
<th>2020 Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>No firm load loss due to gas-fired unit outages during cold weather: <em>Zero is green, else is red</em> (Cold weather months: January – March and December of the same calendar year)</td>
<td><img src="image1" alt="2020 Status" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data (Annual Measurement) (Match with 4.4, year defined as Q3-Q2)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No firm load loss due to gas unavailability: <em>Zero is green, else is red</em></td>
<td><img src="image2" alt="2020 Status" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data (Compared to a 5-year rolling average)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of winter period net MWh of potential production lost due to gas-fired unit outages during cold weather (Cold weather months: January – March and December of the same calendar year) <em>Five-year average: 0.0067%</em></td>
<td>0.00149% 0.00053%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data (Compared to a 5-year rolling average)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of annual net MWh of potential production lost due gas unavailability compared to a 5-year rolling average (Due to data availability, year defined as Q3-Q2) <em>Five-year average: 0.1483%</em></td>
<td>0.192% 0.0898%</td>
</tr>
</tbody>
</table>
Why is it important?

- Measures risks to BPS reliability from three priority causes:
  1. Operator or other human performance issues
  2. Substation equipment failures or failed circuit equipment
  3. Vegetation encroachment
• How is it measured?
  ▪ Number of transmission line outages caused by Human Error divided by the total inventory of circuits

Data (Compared to a 5-year rolling average)
  ▪ Annual outage rate* decreasing compared to a 5-year rolling average (95% Confidence Interval) (Based on 2018 metric)

*Due to data availability, collection year defined as Q3-Q2
How is it measured?

- Number of transmission line outages caused by AC substation equipment outage failures and failed AC circuit equipment (such as transformers), divided by the total inventory of circuits.

Data (Compared to a 5-year rolling average)

- Annual outage rate* decreasing compared to a 5-year rolling average (95% Confidence Interval) (Based on 2018 metric)

*Due to data availability, collection year defined as Q3-Q2.
• How is it measured?
  ▪ Number of potential FAC-003 violations*

  *\text{Year: #}
  2019: 0
  2018: 3
  2017: 6
  2016: 0
  2015: 3
  \text{Mean = 3 Standard deviation = 2.7}

\begin{tabular}{|c|c|c|c|c|}
\hline
\text{Year} & \text{Mean} & \text{Standard deviation} \\
\hline
2015 & 20 & 2.7 \\
2016 & 27 & 2.7 \\
2017 & 20 & 2.7 \\
2018 & 31 & 2.7 \\
2019 & 21 & 2.7 \\
\hline
\end{tabular}

\textbf{Data* (Compared to a 5-year rolling average)}
  ▪ Number of vegetation encroachments, excluding fall-ins, decreasing (within one standard deviation, based on small sample size) (Based on 2018 metric) -- 5-year average is 3.0

\textbf{Data** (Compared to a 5-year rolling average)}
  ▪ Fall-ins: Number of vegetation encroachments decreasing (within one standard deviation, based on 6-year sample) -- 5-year average is 23.8
Why is it important?

- Measures risk and impact to the BPS from cyber or physical security attacks

How is it measured?

- Based on industry-submitted OE-417 and/or EOP-004 Electric Emergency Incident and Disturbance Reports*
  
  *One cyber security and 34 physical security events were reported in Q4 2019.*

*As more data becomes available this metric will be enhanced to provide increased granularity of this risk

Data (Annual Measurement), based on 2018 metric

- No disruption** of BES operations due to cyber attacks
- No disruption** of BES operations due to physical attacks: Zero is green, else is red

**A disruption means that a BES facility was removed from service as a result of the cyber or physical incident
RI 7: Disturbance control events greater than the most severe single contingency

• Why is it important?
  ▪ Measures risk to the BPS by monitoring the number of Disturbance Control Standard (DCS) events that are greater than the Most Severe Single Contingency (MSSC)

• How is it measured?
  ▪ Information received by NERC based on the BAL-002 Reliability Standard
  ▪ Due to the timing in Balancing Authority data submittals the metric is updated one quarter in arrears
  ▪ Measures a rolling 7 year quarterly time trend testing for statistical significance

Data (Quarterly Measurement), New
  ▪ **Green**: a time trend line of the most recent 7 years of quarterly DCS events > MSSC has a statistically significant negative slope
  ▪ **Middle**: no statistically significant trend for the slope
  ▪ **Red**: a time trend line of the most recent 7 years of quarterly DCS events > MSSC has a statistically significant positive slope

2020 Status

- **Increasing Trend**
- **No Statistical Trend**
- **Decreasing Trend**
Why is it important?

- Measures risk and impact to the BPS by measuring the interconnection frequency response performance measure (IFRM) for each BAL-003-1 event as compared to the Interconnection Frequency Response Obligation (IFRO).

How is it measured?

- IFROs are calculated and recommended in the Frequency Response Annual Analysis Report for Reliability Standard BAL-003-1.1 implementation.
- IFRM performance is measured for each event by comparing the resource (or load) MW loss to the frequency deviation.
- Due to the timing in selection of events the metric is updated one quarter in arrears.

Data (Quarterly & Annual Measurement), New

- IFRM for each BAL-003-1 event is compared to the IFRO for each quarter of the 2020 operating year.
- Success is no Interconnection experiencing a BAL-003-1 frequency event where IFRM performance is below their respective IFRO: Zero is green, else is red.