

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

2020 ERO Enterprise Reliability Indicators

Dashboards are for example only and will be updated based on quarterly results

RELIABILITY | RESILIENCE | SECURITY



- **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)

Data (Annual Measurement)

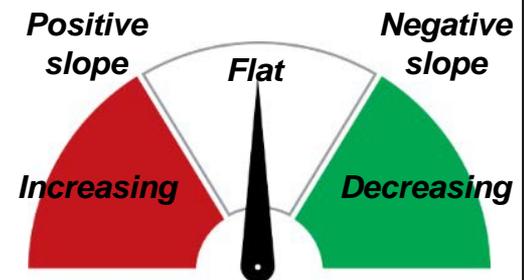
- Threshold: No Category 3 or above events: *Zero is green, else is red*

2020 Status



Data (Compared to a 5-year rolling average)

- Slope of eSRI line is flat to decreasing and does not show an increase above zero that is statistically significant (95% Confidence Interval).
- “2020 Status” relates to the slope of the 5-year rolling average (Positive, Flat or Negative), not just the 2020 performance.



- **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

<p>Data (Annual Measurement)</p> <ul style="list-style-type: none"> ▪ Moderate and serious risk repeat violations filed with FERC on organizations that have Compliance History (based on 2017 metric) 	<p>2020 Status</p> 
<p>Data (Annual Measurement)</p> <ul style="list-style-type: none"> ▪ Percent of noncompliance self-reported (Self-certified noncompliance is not included) (same as 2018 metric) 	
<p>Data (Compared to a 3-year rolling average)</p> <ul style="list-style-type: none"> ▪ The number of serious risk violations resolved compared to the total noncompliance resolved (based on 2018 metric) 	

* 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.

- **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)

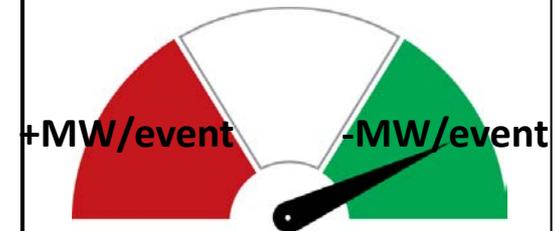
2020 Status



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



- **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

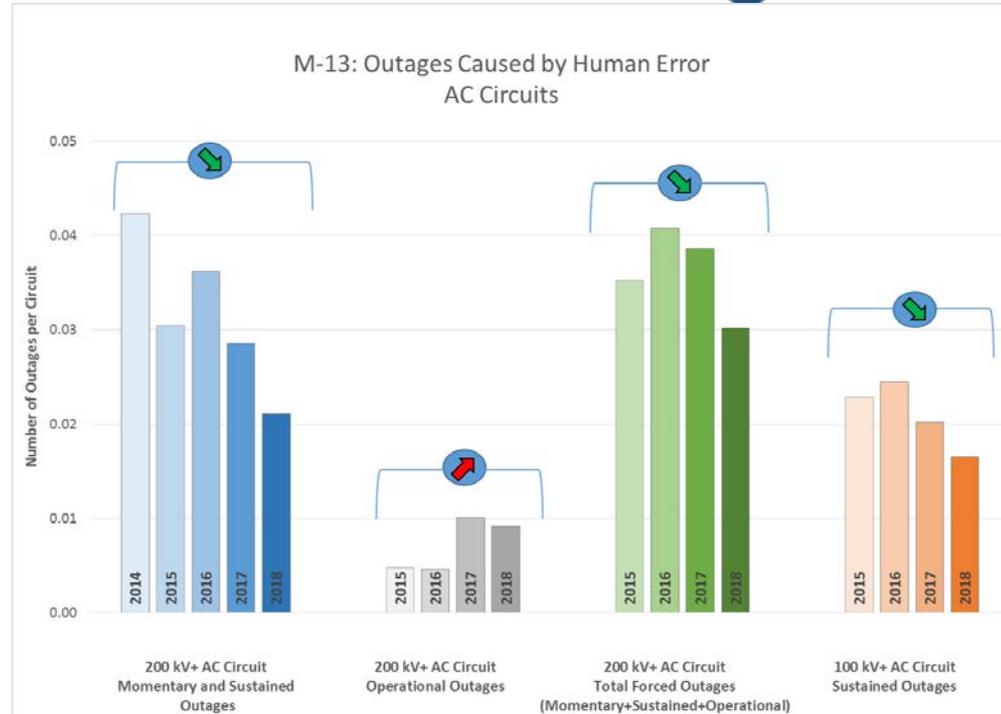
<p>Data (Annual Measurement)</p> <ul style="list-style-type: none"> ▪ No firm load loss due to gas-fired unit outages during cold weather: <i>Zero is green, else is red</i> (Cold weather months: January – March and December of the same calendar year) 	<p>2020 Status</p> 
<p>Data (Annual Measurement) (Match with 4.4, year defined as Q3-Q2)</p> <ul style="list-style-type: none"> ▪ No firm load loss due to gas unavailability: <i>Zero is green, else is red</i> 	
<p>Data (Compared to a 5-year rolling average)</p> <ul style="list-style-type: none"> ▪ 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) <i>Five-year average: 0.0067%</i> 	<p>0.00149% 0.00053%</p> 
<p>Data (Compared to a 5-year rolling average)</p> <ul style="list-style-type: none"> ▪ 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) <i>Five-year average: 0.1483%</i> 	<p>0.192% 0.0898%</p> 

- **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

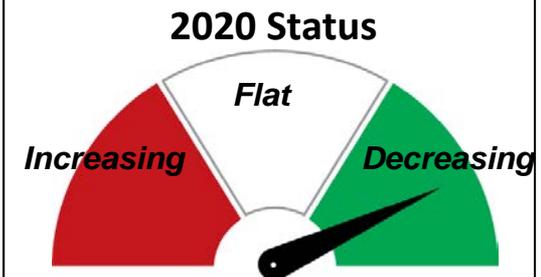
- **How is it measured?**

- Number of transmission line outages caused by Human Error divided by the total inventory of circuits



Data (Compared to a 5-year rolling average)

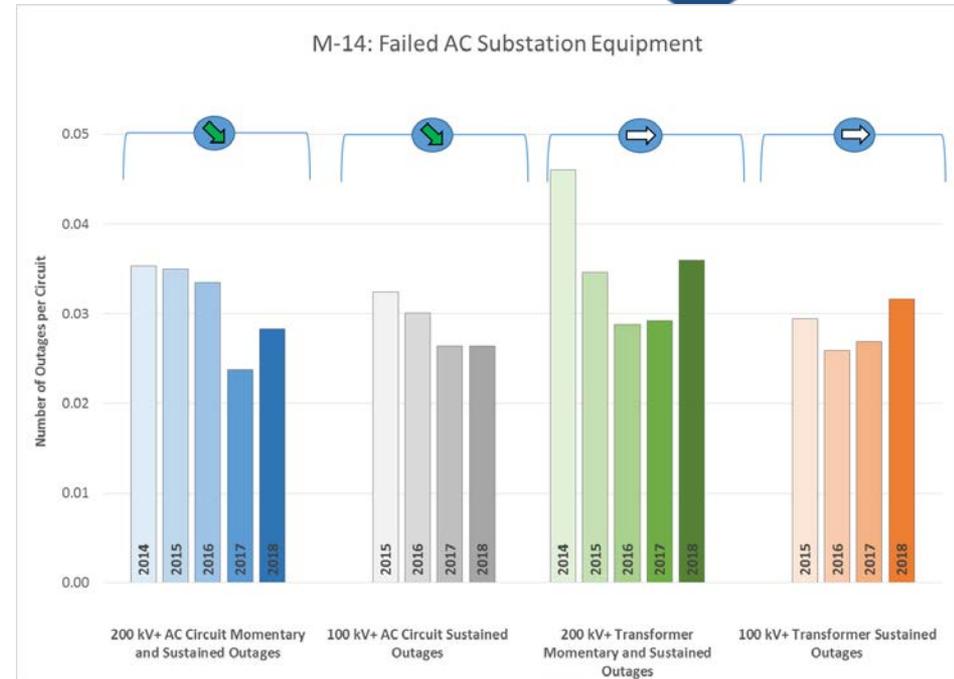
- Annual outage rate* decreasing compared to a 5-year rolling average (95% Confidence Interval) (Based on 2018 metric)



*Due to data availability, collection year defined as Q3-Q2

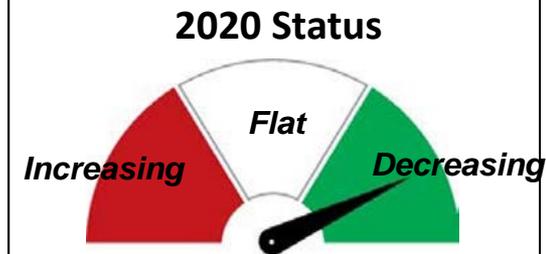
• How is it measured?

- 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*

Year: #

2019: 0

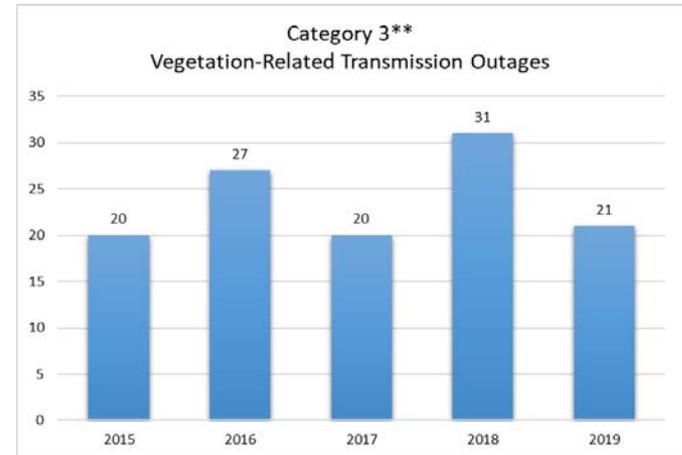
2018: 3

2017: 6

2016: 0

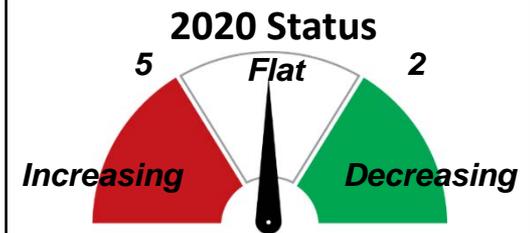
2015: 3

Mean = 3 Standard deviation = 2.7



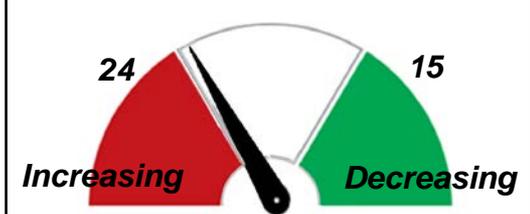
Data* (Compared to a 5-year rolling average)

- 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



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.

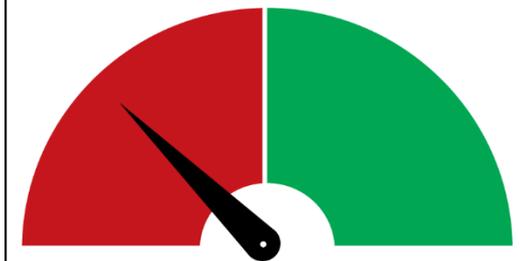
*As more data becomes available this metric will be enhanced to provide increased granularity of this risk

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

2020 Status



- **Why is it important?**

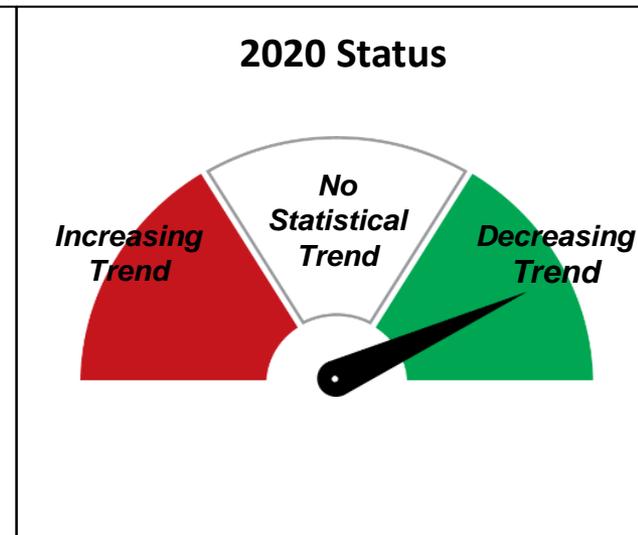
- Measures risk to the BPS by monitoring the number of Disturbance Control Standard (DCS) events that are greater than the Most Severe Single Contingency (MSSC)

- **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



- **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

2020 Status

