

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

2018 NERC Board of Trustees' Committee Effectiveness Surveys Results

Corporate Governance and Human Resources Committee Meeting
May 8, 2019

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- NERC engaged TalentQuest to conduct its annual Board of Trustees' Committee Surveys. This report provides the results for the assessments from the following six committees:
 - Compliance Committee (5 members)
 - Nominating Committee (13 members)
 - Finance and Audit Committee (5 members)
 - Enterprise-wide Risk Committee (8 members)
 - Corporate Governance and Human Resources Committee (5 members)
 - Technology and Security Committee (5 members)

- The assessments consisted of the same three Yes-No questions with comment fields for explaining responses.
 - *Is the organization and structure of the committee appropriate for effective operation?*
 - *Is the committee effectively carrying out its purpose, as well as performing such other responsibilities as directed by the Board or the committee mandate?*
 - *Is the committee's mandate appropriate?*

- All six committees had 100% of their members complete the assessment.
- 100% of committee members were able to answer “Yes” to all three questions.
- Explanations provided for “Yes” answers appear on the following slides.

Assessment Results By Committee

- **Q1. Is the organization and structure of the committee appropriate for effective operation? 100% “Yes”, N=5**
 - *“The operation of the committee is appropriate and professional. Janice spent significant effort throughout the year ensuring that all input and ideas were welcome.”*
 - *“BOTCC has been working well under the leadership of Janice Case. I specifically appreciate the focus on consistency across the regions and the application of penalties.”*

- **Q2. Is the committee effectively carrying out its purpose as well as performing such other responsibilities as directed by the Board or the committee mandate? 100% “Yes”, N=5**
 - *“The committee carries out all functions in a timely and professional manner.”*
 - *“Yes, great strides have been made on aligning penalties for serious violations and identifying key risk areas. Bringing the regions into the meetings to see committee member questions and other regions’ presentations has been most helpful.”*

- **Q3. Is the committee's mandate appropriate? Include any specific provision the committee should add to or remove from the mandate. 100% "Yes", N=5**
 - *"The mandate is appropriate and is reviewed annually."*

- **Q1. Is the organization and structure of the committee appropriate for effective operation? 100% “Yes”, N=13**
 - *“The process has been honed over the years and works well.”*
 - *“The size can become unwieldy when doing interviews. Fred did the right thing by pairing down the group to do the interviews. However you can feel out of the loop if not on the interview team. Might need to consider some kind of report out from the interview.”*
 - *“Well conceived and executed - broad representation, frank and open discussion, remarkable agreement on conclusions.”*
 - *“The group is representative of parties that must be at the table yet it is manageable and effective.”*
 - *“While it is the MRC's responsibility to approve the new BOT, I feel the current BOT have the responsibility to ensure that the new candidate will fit in to the current Board mix. Having (in general) 6 Board members and 5 MRC members is the appropriate mix in my opinion.”*
 - *“I think this committee works very well. Fred has done a great job leading and the committee members have been fully engaged.”*
 - *“Appreciate the engagement of industry & Trustees.”*

- **Q2. Is the committee effectively carrying out its purpose as well as performing such other responsibilities as directed by the Board or the committee mandate? 100% “Yes”, N=13**
 - *“It does carry its purpose. However, it could also review more broadly the scope and the process.”*
 - *“No further comment.”*

- **Q3. Is the committee's mandate appropriate? Include any specific provision the committee should add to or remove from the mandate. 100% "Yes", N=13**
 - *"No comments."*
 - *"No further comment."*

- **Q1. Is the organization and structure of the committee appropriate for effective operation? 100% “Yes”, N=5**
 - *“Jan was a great Chair and the committee had a very productive year.”*
 - *“Members are engaged and the agendas are appropriate.”*
 - *“This committee has the unique & inherent challenge of developing a budget that will meet the requirements of NERC's mandate while being supported by industry. There may be an opportunity to better manage communications this next year recognizing that the Canadian support of the E-ISAC will be a challenge.”*

- **Q2. Is the committee effectively carrying out its purpose as well as performing such other responsibilities as directed by the Board or the committee mandate? 100% “Yes”, N=5**
 - *“The committee spent significant time and effort on the budget which resulted in a clean FERC approval.”*

- **Q3. Is the committee's mandate appropriate? Include any specific provision the committee should add to or remove from the mandate. 100% “Yes”, N=5**
 - *“The mandate is appropriate and is reviewed annually by the committee.”*
 - *“Mandate was reviewed recently and no changes were identified.”*
 - *“Increased focus that has begun on controls and policies is appropriate to fiduciary duty.”*

- **Q1. Is the organization and structure of the committee appropriate for effective operation? 100% “Yes”, N=8**
 - *“The committee is mature ,well managed and all members contribute. Staff in particular are engaged and competent.”*
 - *“Good relationship between committee and staff, structure and engagement works well, good opportunity to provide input.”*
 - *"The Committee is maturing well and becoming more focused under the leadership of Dave Goulding. Michelle and Matt provide tremendous staff support and the CCC role is very constructive. The more recent audits of RE areas are very valuable."*
 - *“Have seen significant improvement in the working relationships between Board Members, ERO and CCC participants over the last few years. Discussion is helpful in developing audit/oversight opportunities to support ERO programs and initiatives.”*

- **Q2. Is the committee effectively carrying out its purpose as well as performing such other responsibilities as directed by the Board or the committee mandate? 100% “Yes”, N=8**
 - *“The committee and staff review the mandate and work programs are set to identify and examine items that could present a risk to the ERO.”*
 - *“Presentations to understand how a risk has moved from inherent to residual are quite important.”*

- **Q3. Is the committee's mandate appropriate? Include any specific provision the committee should add to or remove from the mandate. 100% “Yes”, N=8**
 - *“The mandate is reviewed at least annually, including recently. A minor change was made a few meetings ago.”*
 - *“No changes are needed at this time.”*

- **Q1. Is the organization and structure of the committee appropriate for effective operation? 100% “Yes”, N=5**
 - *“The committee was organized and the materials were always timely and professional. It was a very busy year for CGHR and everything was accomplished in the annual work plan.”*
 - *“A tremendous result in 2018. Bob did a great job as leader and the committee was highly engaged.”*
 - *“Bob has provided great leadership in a very difficult year -- through the CEO transition, but also on compensation and metrics. The Committee has worked extremely well.”*
 - *“Board Chair did a remarkable job in 2018 when confronted with a wide range of exceptional circumstances. Plus the analysis and thoughtful changes to the compensation process was very well done.”*

- **Q2. Is the committee effectively carrying out its purpose as well as performing such other responsibilities as directed by the Board or the committee mandate? 100% “Yes”, N=5**
 - *“Everything was done very effectively to include CEO search, CSO search, modification of compensation plans and annual reviews of all Officers. Oversight of the Corporate Governance process included a bylaw revision that was approved by the MRC and FERC.”*
 - *“The very heavy workload this past year was handled excellently.”*
 - *“Good process and flow for deadlines, lots of opportunity to engage and discuss before final.”*
 - *“Excellent work done based on thoughtful ideas and assessments of various options and opportunities.”*

- **Q3. Is the committee's mandate appropriate? Include any specific provision the committee should add to or remove from the mandate. 100% “Yes”, N=5**
 - *“The mandate was reviewed and one modification was made. All aspects of the mandate were completed by the committee.”*

- **Q1. Is the organization and structure of the committee appropriate for effective operation? 100% “Yes”, N=5**
 - *“Restructured focus and role is appropriate given the issues and risks we face.”*
 - *“The committee is new and feeling its way in terms of appropriate oversight of a growing and very important part of NERC's work, both security and our ever-increasing dependency on IT. Great start!”*
 - *“Meetings are almost always a variant of two components: update on E-ISAC and update on IT Programs. The information is comprehensive and NERC staff engaged and responsive. I always wonder if there is anything we are missing.”*
 - *“Really impressed with how the new committee has quickly come together. Now that the committee is in its second full year, there is an opportunity to further grow the agenda to include additional items.”*

- **Q2. Is the committee effectively carrying out its purpose as well as performing such other responsibilities as directed by the Board or the committee mandate? 100% “Yes”, N=5**
 - *“I answered 'yes' but I think the responsibilities of this committee are still evolving.”*

- **Q3. Is the committee's mandate appropriate? Include any specific provision the committee should add to or remove from the mandate. 100% "Yes", N=5**
 - *"I have only wondered whether the important relationship with the MEC should be spelled out."*



Questions and Answers

2019 ERO Enterprise Metrics

Second Quarter Status

Mark Lauby, Senior Vice President and Chief Reliability Officer
Corporate Governance and Human Resources Committee Meeting
May 8, 2019

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Green



Risk indicator getting better

Neutral



Risk indicator between getting better and getting worse

Red



Risk indicator getting worse

Pass/Fail




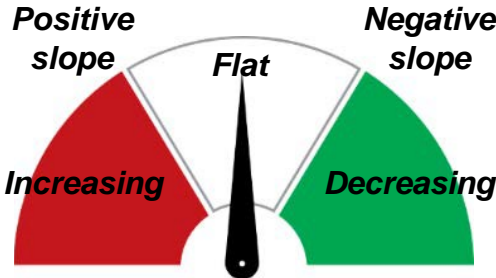
Risk indicator either met or not

- **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)

| | |
|--|---|
| <p>Data (Annual Measurement)</p> <ul style="list-style-type: none"> ▪ Threshold: No Category 3 or above events: <i>Zero is green, else is red</i> <p>As of 4/1/2019, Metric status is Green. There are no category 3 or above events in 2019 YTD.</p> | <p>2019 Status</p>  |
| <p>Data (Compared to a 5 year rolling average)</p> <ul style="list-style-type: none"> ▪ Slope of eSRI line is flat to decreasing and does not show an increase above zero that is statistically significant (95% Confidence Interval). As of 4/1/2019, Metric status is Neutral. ▪ “2019 Status” relates to the slope of the 5 year rolling average (Positive, Flat or Negative), not just the 2019 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

Data (Annual Measurement)

- Moderate and serious risk repeat violations filed with FERC on organizations that have Compliance History (based on 2017 metric)
---- Current number is 50

2019 Status



Data (Annual Measurement)

- Percent of noncompliance self-reported (Self-certified noncompliance is not included) (same as 2018 metric)
----Current number is 77.5%

75% 80%



Data (Compared to a 3-year rolling average)

- The number of serious risk violations resolved compared to the total noncompliance resolved (based on 2018 metric)
--- Current number is 1.8%

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.

- **Why is it important?**

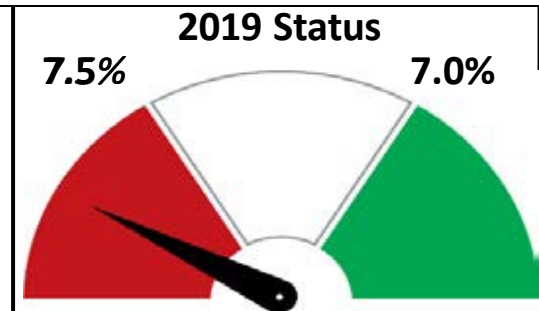
- Protection system misoperations exacerbate the impacts

- **How is it measured?**

- Annual Misoperations rate and the annual loss of load for events with misoperations (rate through Q2 2019)

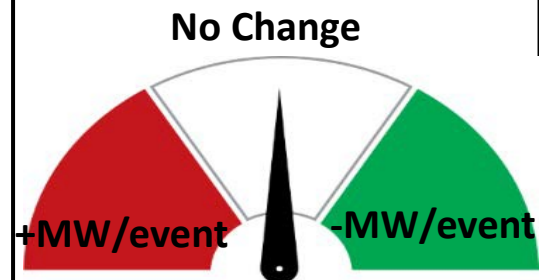
Data (Year-Over-Year Comparison)

- Q3-Q2 comparison misoperations rate based on collection interval (95% Confidence Interval) (Based on 2018 Metric)
- **Includes four years through Q2 2018. Data for year five not available until Q3 dashboard.**



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) (New)
- **As of 4/1/2019, Statistical analysis indicates no change. Metric is Neutral/White.**







Metric 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

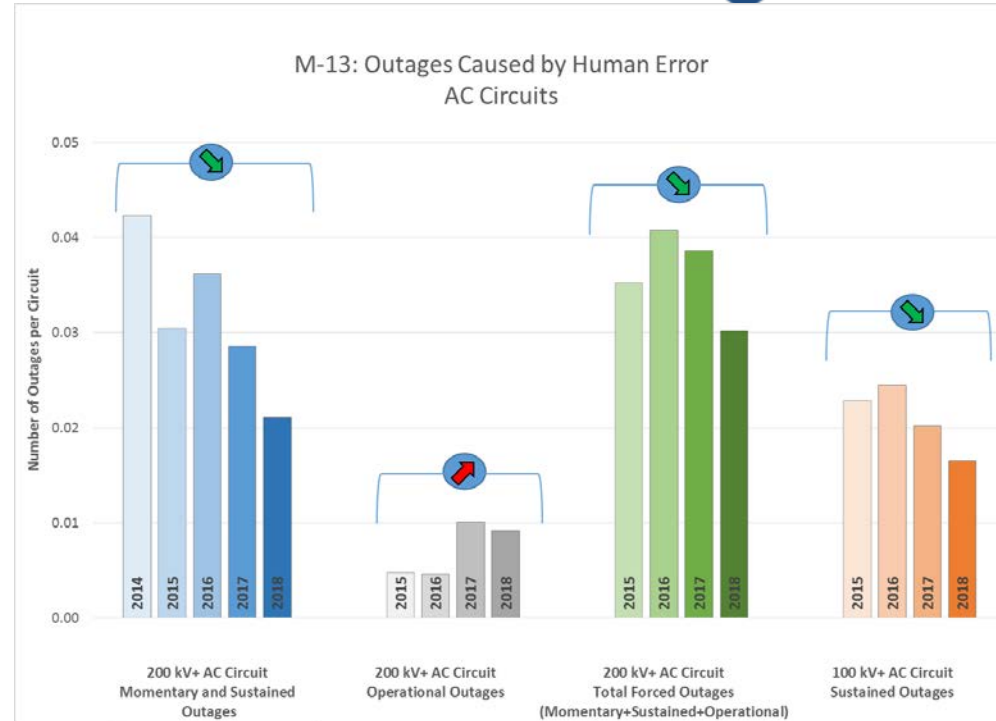
| | |
|---|--|
| <p>Data (Annual Measurement)</p> <ul style="list-style-type: none"> ▪ No firm load loss due to gas-fired unit outages during cold weather: <i>Zero is green, else is red (Cold weather months: January – March and December of the same calendar year) As of 4/1/2019, Metric status is Green.</i> | <p>2019 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 As of 4/1/2019, Metric status is Green.</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) ▪ Five-year average: 0.0068% | <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) ▪ Five-year average: 0.1312% | <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?

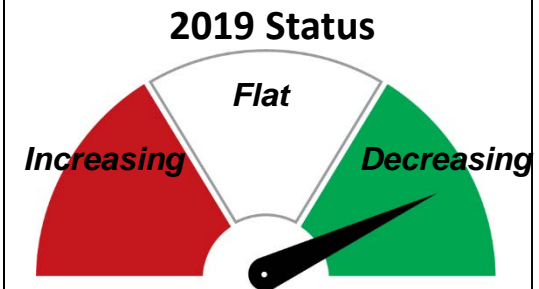
- Number of transmission line outages caused by Human Error divided by the total inventory of circuits



Data (Compared to a 5-year rolling average)

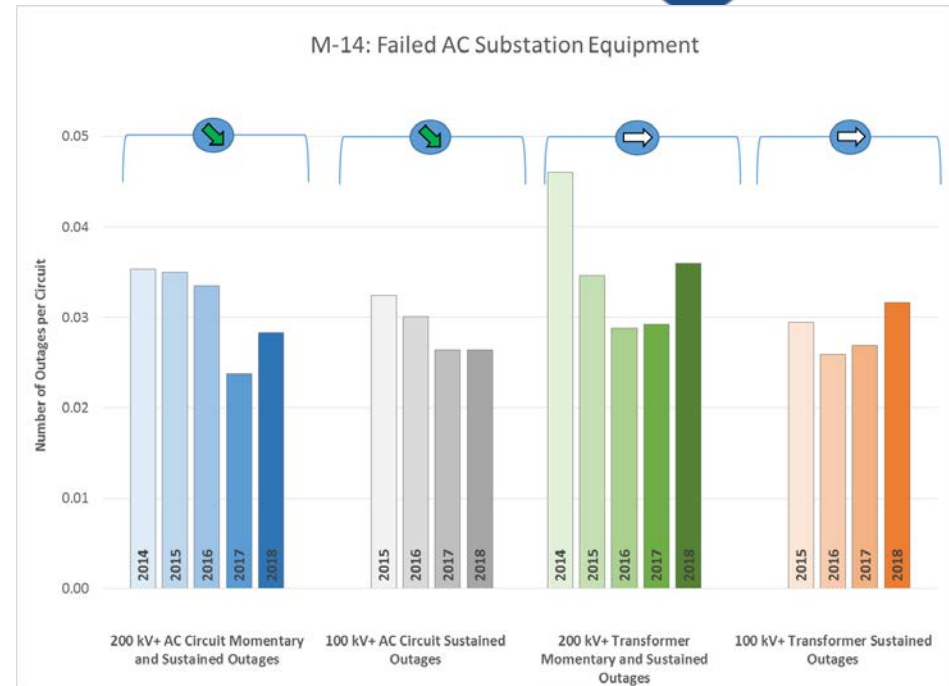
- Annual outage rate* decreasing compared to a 5-year rolling average (95% Confidence Interval) (Based on 2018 metric)

*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

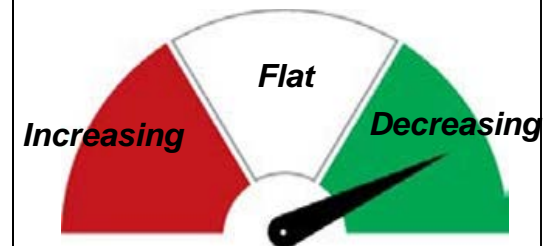


Data (Compared to a 3-year rolling average)

- Annual outage rate* decreasing compared to a 3-year rolling average (95% Confidence Interval) (Based on 2018 metric)

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

2019 Status



- **How is it measured?**

- Number of potential FAC-003 violations*

Year: #

2018: 3

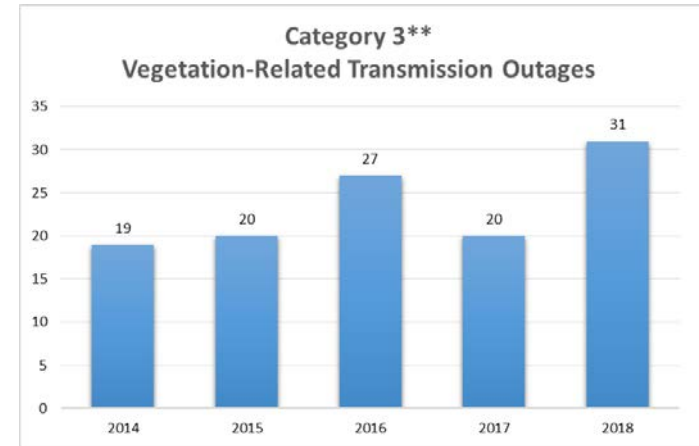
2017: 6

2016: 0

2015: 3

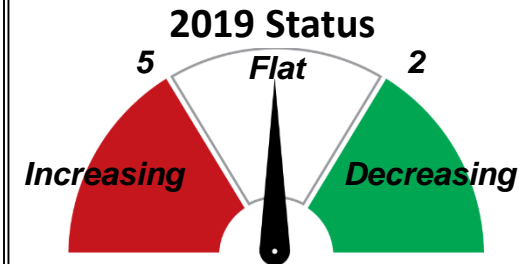
2014: 0

Mean = 2.4 Standard deviation = 2.5



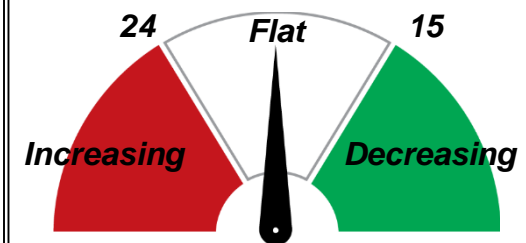
Data* (Compared to a 5-year rolling average)

- 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 2.4



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 23.4



- **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 29 physical security events were reported in Q1 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
Zero disruptions of BES operations due to cyber attacks in 2019 Q1
- No disruption** of BES operations due to physical attacks: *Zero is green, else is red*
One disruption of BES operations due to physical attacks in 2019 Q1

**A disruption means that a BES facility was removed from service as a result of the cyber or physical incident

2019 Status



Metric 7: Disturbance control events greater than the most severe single contingency

- **Why is it important?**

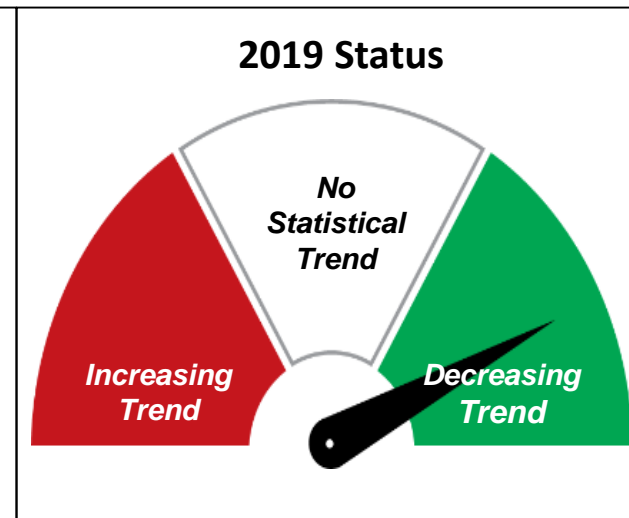
- Measures risk to the BPS by monitoring the number of Disturbance Control Standard (DCS) events that are greater than the Most Severe Single Contingency (MSSC)

- **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
- **4Q18 Metric Results: Green** - DCS data for the most recent 28 quarters shows a statistically significant 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 2019 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*
- **4Q18 Metric Results:** No Interconnection experienced an event where their IFRM was below their IFRO

2019 Status





Questions and Answers