

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

2018 ERO Enterprise Metrics

Mike Walker, Senior Vice President and Chief Enterprise Risk and Strategic
Development Officer
Corporate Governance and Human Resources Committee Meeting
November 2, 2017

RELIABILITY | ACCOUNTABILITY



- ERO Enterprise leadership reviewed and updated the 2017 metrics for 2018
- Input from Board of Trustees (Board) and stakeholders
 - Two stakeholder comment periods
 - May and August Member Representatives Committee (MRC) meetings
 - MRC Business Plan and Budget Input Group
- Requesting Corporate Governance and Human Resources Committee endorsement for Board approval on November 9

- 2018 metrics same as last year's at the metric level
 - Facilitates year-over-year comparisons
 - Clarifications and updates to measures, thresholds, and targets
- Notable enhancements:
 - Added cyber and physical security targets to Metric 4
 - Adjusted how serious risk violations are measured in Metric 5
 - Removed Metric 6 sub-metric on generators forced out by cold weather
 - Focused Metric 6 sub-metric on vegetation management on one target of no transmission line outages due to FAC-003 violations
 - Focused Metric 7 on ERO Enterprise-wide efficiency and effectiveness

- **Metric 1: Fewer, less severe events**
 - Number of Category 3 or above events
 - Slope of event Severity Risk Index trend line
- **Metric 2: No gaps in Reliability Standards or compliance monitoring**
 - Number of Category 3 or above events resulting from identified gaps
 - Identification of gaps for Category 2 and below events
 - Development of mitigation plans for gaps
- **Metric 3: Any resource deficiencies are foreseen**
 - Number of events with load shed over 300 MW due to resource deficiency or common mode failures
 - Number of Energy Emergency Alert 3 declarations for resource deficiencies

- **Metric 4: Reduced risk from unauthorized physical or electronic access**
 - Number of events with load loss due to cyber attack
 - Number of facility disruptions resulting in over 100 WW of load loss due to physical attack
 - Number of Bulk Electric System (BES) operations disruptions due to cyber attack
 - Trend of frequency of physical security events impacting the BES (baseline using available data)
 - Rate of cases resulting in malware inside a network or device (baseline using existing and new data)
 - Cyber hygiene and internet risk scores (baseline using new data)
 - Cyber and physical readiness (develop program/baseline using new data)

- **Metric 5: Reduced reliability risk from noncompliance**
 - Percent of noncompliance that is self-reported
 - Mitigation completion rates
 - Percent of noncompliance that is serious risk violations
 - Trend of number of repeat moderate and serious risk violations

- **Metric 6: Reduced risks in targeted areas**

- Annual protection system Misoperations rate
- Transmission outages caused by human error, substation equipment failures, or failed circuit equipment
 - Number of events with load loss greater than 300 MW
 - Trend of number of transmission line outages per circuit
 - Trend of number of events
- Number of transmission line outages due to violation of NERC's vegetation management standard

- **Metric 7: ERO Enterprise efficiency and effectiveness**
 - Operating within established financial parameters
 - Implementation of technology solutions
 - Assessment of quantitative and qualitative value of completed projects
 - Compliance Monitoring and Enforcement Program Technology Project milestone and budget performance
 - Targeted improvement in the three most unfavorable ERO Enterprise Effectiveness Survey results
 - Plan to achieve reduction in consolidated ERO Enterprise operating costs



Questions and Answers

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2017 ERO Enterprise Metrics

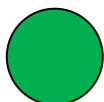
Third Quarter Status

Mark Lauby, Senior Vice President and Chief Reliability Officer
Corporate Governance and Human Resources Committee Meeting
November 2, 2017

RELIABILITY | ACCOUNTABILITY

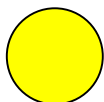


Green



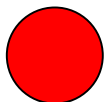
**On schedule and expected to meet by
end of year**

Yellow



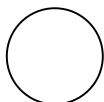
**Behind schedule but expected to meet
by end of year**

Red



Not expected to meet by end of year

No Color







Status not available

- **Why is it important?**

- Measures risk to the bulk power system (BPS) from Bulk Electric System (BES) events

- **How is it measured?**

- Number of Category 3–5 events
- Cumulative trend line in the composite daily event Severity Risk Index (eSRI) for Category 1–3 events





	Data Trend	Q2	Q3
Threshold 1 Target 1	No Category 3 or above events		
Threshold 2 Target 2	Current slope of trend line is negative		

- **Why is it important?**

- Reduces risk to BPS reliability from potential gaps in standards and compliance by employing corrective action

- **How is it measured?**

- Using a consistent process, analysis of all Category 3–5 and select events for any gaps in standards and compliance and mitigation implementation
- Any gaps result in action plans to address reliability risks





	Data Trend	Q2	Q3
Threshold 1	No Category 3 or above events; studying sample events of interest		
Target 1	Gap analysis results reported at year-end		

- **Why is it important?**

- Ensures ERO Enterprise is performing comprehensive and timely reliability assessments that identify and spotlight resource adequacy deficiencies

- **How is it measured?**

- Number of resource deficiencies that caused load outages over 300 MW or Energy Emergency Alert Level 3s (EEA-3s) that were not identified in prior seasonal or long-term reliability assessments in the past three years

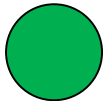
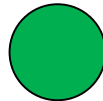
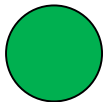
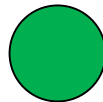
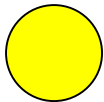
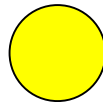
	Data Trend	Q2	Q3
Threshold 1	No firm load outages over 300 MW due to resource deficiencies or common mode failures		
Target 1	No EEA-3s declared due to resource deficiencies		

- **Why is it important?**

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

- **How is it measured?**

- Number of load losses or disruptions to BES operations due to cyber attack
- Number of load losses over 100 MW due to physical attack and the trend line for events over the most recent two year period

	Data Trend	Q2	Q3
Threshold 1 Target 1	No load loss or disruption of BES operations due to cyber attack		
Threshold 2	No load loss over 100 MW due to physical attack		
Target 2	Assessing trend of physical security events		

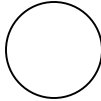
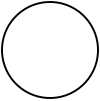
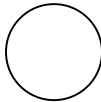
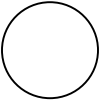
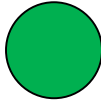
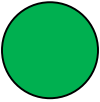
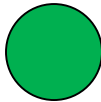
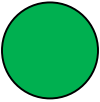
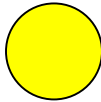
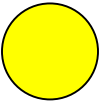
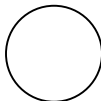
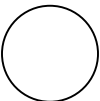
- **Why is it important?**

- Incentivizes discovery and mitigation of violations by registered entities and measures violation severity as well as completion of mitigations

- **How is it measured?**

- Trend of compliance severity risk index (with and without CIP V5) and amount of repeat moderate and severe risk violations
- Percentage of self-identified noncompliance
- Mitigation completions rates

Metric 5: Reduced Reliability Risk from Noncompliance

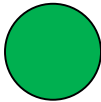
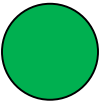
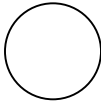
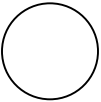
	Data Trend	Q2	Q3
Threshold 1 Target 1	Compliance severity index (excluding CIP V5) reported at Q4		
Threshold 2 Target 2	Compliance severity index (including CIP V5) reported at Q4		
Threshold 3 Target 3	86.6% of all noncompliance is self-identified		
Threshold 4	Current mitigation completion rates are 70.5% (2016), 97.6% (2015), and 99.8% (2014 & older).		
Target 5			
Target 4	Repeat risk trends reported at Q4		

- **Why is it important?**

- Measures risks to BPS reliability from five priority causes:
 - a. Generating unit forced outages due to cold weather
 - b. Misoperations rate of performance
 - c. Automatic AC transmission outages caused by human error
 - d. Transmission outages due to AC substation equipment failures
 - e. Transmission line outages due to vegetation

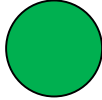
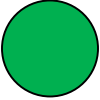
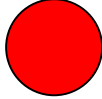
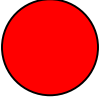
- **How is it measured?**

- Number of load losses from generating units forced outages due to cold weather
- Comparison of annual Effective Forced Outage Rate (EFOR) of generating units to previous years during the most extreme cold winter months

	Data Trend	Q2	Q3
Threshold 1	No events with firm load loss in winter months		
Target 1	Comparison to previous year EFORs underway		

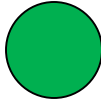
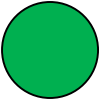
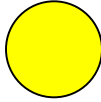
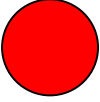
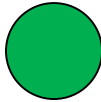
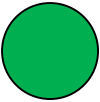
- **How is it measured?**

- Annual Misoperations rate (cumulative rate through Q2 2017), with a threshold of less than 9% and target of less than 8%

	Data Trend	Q2	Q3
Threshold 1	2017 State of Reliability report had an annual rate of 8.3%		
Target 1			

- **How is it measured?**







- Number of load losses greater than 300 MW caused by human error
- Trend of outages per circuit caused by human error (target is 5% decline with reduced impacts)
- Comparison of outages caused by human error resulting in firm load loss to previous five-year average

	Data Trend	Q2	Q3
Threshold 1	No events with load loss greater than 300 MW from human error		
Target 1	Outages per circuit caused by human error currently not declining by 5%		
Target 2	Average number of events currently fewer than five-year average		

- **How is it measured?**

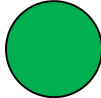
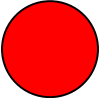
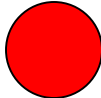
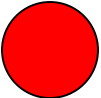
- Number of load losses greater than 300 MW due to AC substation equipment failures
- Trend of outages per circuit caused by AC substation equipment failures (target is 5% decline with reduced impacts)
- Comparison of outages caused by AC substation equipment failures resulting in firm load loss to previous five-year average

Metric 6d: Number of Transmission Outages Due to AC Substation Equipment Failures

	Data Trend	Q2	Q3
Threshold 1	No events with load loss greater than 300 MW from substation equipment failures		
Target 1	Outages per circuit caused by substation equipment are declining by greater than 5% and outages are declining		
Target 2	Average number of events currently fewer than five-year average		

- **How is it measured?**

- Number of FAC-003 violations that are identified, processed, and filed
- Number of vegetation-related outages that are not violations of FAC-003 gathered through quarterly data submittals

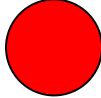
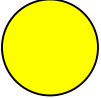
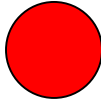
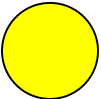
	Data Trend	Q2	Q3
Threshold 1	At least one outage due to FAC-003 violations in Q2		
Target 1	13 vegetation-related outages through Q2 that were not FAC-003 violations		

- **Why is it important?**

- Measures NERC's performance in meeting important financial and operational objectives:
 - a. Execution of business plan and budget
 - b. Implementation of ERO Enterprise technology solutions
 - c. Implementation of the Regional Entity oversight plans and NERC adherence to the Rules of Procedure
 - d. Implementation of action plans in response to ERO Enterprise Effectiveness Survey results

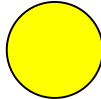
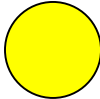
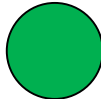
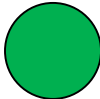
- **How is it measured?**

- NERC is at or under budget for expenses and fixed assets (exclusive of authorized operating reserves for threshold and inclusive of operating reserves for target)

	Data Trend	Q2	Q3
Threshold 1	Projected to be over budget by 0.4% and working to meet budget by year end		
Target 1			





- **How is it measured?**

- Completion of ERO Enterprise IT projects for Entity Registration, data reporting (event analysis, misoperations, or TADS), and NERC’s public-facing website
- Development of a method to measure and track the cost-benefit of ERO Enterprise IT projects

	Data Trend	Q2	Q3
Target 1	IT projects on track; Q3 deliverables delayed for Entity Registration but expect completion by year-end		
Target 2	Processes and procedure for cost-benefit developed and under review		

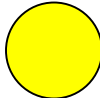
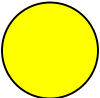
- **How is it measured?**

- Implementation of the recommendations and schedule from 2016 audits
- Number of significant new noncompliance findings in NERC’s implementation of the Regional Entity oversight plans or adherence to the Rules of Procedure

	Data Trend	Q2	Q3
Target 1	Implementation of audit recommendations on track		
Target 2	NERC performing oversight in accordance with oversight plans		

- **How is it measured?**

- Implementation of 2017 milestones identified in the action plans

	Data Trend	Q2	Q3
Target 1	<p>Majority of a plans on track</p> <p>Actions plans for Registration items are behind due to shifting priorities and plans will be adjusted accordingly</p>		



Questions and Answers