Standards Actions

Howard Gugel, Vice President of Engineering and Standards
Board of Trustees Meeting
May 14, 2020
• Response to CIP V5 Transition Advisory Group Memo
• Reliability Benefits
  ▪ Provides clarity on Transmission Operator Control Center criteria
  ▪ Based on aggregated weighted value
• Minority Issues
  ▪ None
• Cost Effectiveness
  ▪ No cost effective concerns.
• Action
  ▪ Adopt CIP-002-6 – Cyber Security – BES Cyber Systems Categorization
• Project 2018-03 Standards Efficiency Review Retirements

• FERC proposed a remand of VAR-001-6

• Minority Issues
  ▪ None

• Cost Effectiveness
  ▪ No cost effective concerns

• Action
  ▪ Withdraw VAR-001-6 – VAR-001-6 – Voltage and Reactive Control and VAR-001-5 will remain in effect
Questions and Answers
E-ISAC COVID-19 Update

Manny Cancel, SVP NERC and CEO, E-ISAC
Board of Trustees Open Meeting
May 14, 2020
• Operations
• Threat Landscape
• Cybersecurity Risk Information Sharing Program (CRISP)
• Engagement Activities
The E-ISAC has been actively tracking COVID-19 since February 2020

- Business continuity plan activated and entire E-ISAC working remotely
  - Watch Operations fully staffed
  - CRISP online and functioning
- Portal postings and Level 2 NERC Alert issued
- Engaging and supporting Government partners
- Participating in Electricity Subsector Coordinating Council Tactical Tiger Teams
- Maintaining contact with Tri-Sector entities
24x7 Staffing in Place (Remote)

- Fully Operational in Q3 2020 or sooner
- Cyber and Physical security watch shifts in place staffed by employees and contractors
- Two week schedules in place and adjusted as needed
- Key Functions
  - Threat Analysis
  - Portal Postings and Administration
  - Process Improvement
  - Training, Drills, and Procedure Development
• **Cyber**
  - Health and Human Services Denial of Service attack
  - Remote access and collaboration facilities
  - Disinformation, spearphishing, and credential harvesting
  - Industrial control systems supply chain
  - Phishing and credential harvesting
  - Ransomware and destructive wiper malware
  - Managed Service Providers

• **Physical**
  - Theft, intrusions and surveillance
• New governance framework in place
• Operational Technology Pilot in progress
  ▪ Request for proposal sent to vendors, final responses due May 15
• System Log Pilot
  ▪ Assimilate logs into CRISP and enhance ability to check for threats
  ▪ Target for production Q1 2021
  ▪ Will be incorporated into 2021 CRISP budget
• Medium and small utility cooperative initiative
  ▪ In discussions with Department of Energy, National Rural Electric Cooperative Association, and American Public Power Agency
• Events
  ▪ Event schedule under review and upcoming events switched to web conferences
  ▪ March Industry Engagement Program canceled due to coronavirus/travel restrictions
  ▪ Exploring contractor support options for GridSecCon and GridEx

• Member Feedback Strategy
  ▪ Formalize process to collect, manage, and respond to member feedback in Q2 2020
  ▪ Create and implement member feedback survey (bi-annual)
Designated Approving Official (DAO)

- Benefits of having DAOs
  - Greater fidelity around Portal users (among E-ISAC and members/partners)
  - Enhanced security controls points of contact for member vetting
  - Facilitates more targeted communications and engagement

- Identify a Primary DAO and Alternate DAO(s)
  - Approve new Portal user requests
  - Remove users who no longer need access
  - Review and update information an annual basis
  - Senior security or IT Manager, CIO/CSO, General Manager

- For questions or to identify your DAOs, email memberservices@eisac.com
Questions and Answers
Goals of RSTC Transition

• Set up the RSTC to deliver on the goals outlined in its charter
• Maintain continuity in all ongoing, high-value work across the subgroups
• Capture best practices and synergies through the integration of processes across the “legacy” committees
• Clearly document roles and responsibilities and processes for RSTC to improve clarity going forward and speed transition
• Developing a model to support subgroups that is more collaborative and bottoms-up while maintaining alignment to overall NERC strategy
Elements of RSTC Transition

- **Strategy**: Align the strategic objectives and focus areas of RSTC to NERC’s overall strategic plan
- **Governance**: Clearly establish the oversight responsibilities of the RSTC
- **Organization**: Rationalize subgroup structure to align with RSTC objectives
- **Processes**: Align processes across subgroups to ensure consistency at the RSTC level
- **Objectives/Metrics**: Define consistent metrics / KPIs for RSTC and its subgroups to ensure successful achievement of strategy
<table>
<thead>
<tr>
<th>Foundational Reliability Activities</th>
<th>Grid Transformation</th>
<th>Security Risks</th>
<th>Extreme Natural Events</th>
<th>Critical Infrastructure Interdependencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive activities which support Risk Priorities</td>
<td>• Monitor RSTC and sub-group activity to ensure it addresses across all four Risk Priorities effectively</td>
<td></td>
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</tr>
<tr>
<td>Foundational Reliability Activities</td>
<td>• Continue situational awareness, events analysis and personnel certification; complete recurring assessments and manage standing databases (including items from NERC Rules of Procedure)</td>
<td></td>
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<tr>
<td>Organizing and deploying top talent</td>
<td>• Ensure that the expertise of RSTC members, sub-group members, and NERC Staff is being deployed on highest-value work based on expected risk mitigation benefits</td>
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</tr>
<tr>
<td>Developing and delivering innovative and risk-based programs and tools</td>
<td>• Use a risk-based view to determine how sub-group activities can be focused on solving the highest-risk issues facing the utility industry through innovative solutions based on cross-functional expertise</td>
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</tr>
<tr>
<td>Collaborating effectively with industry and other stakeholders</td>
<td>• Promote effective information-sharing and problem-solving between industry stakeholders, ERO, and other industry groups to identify risk-mitigation methods and efficiency improvements</td>
<td></td>
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</tr>
<tr>
<td>Maintaining independence and objectivity</td>
<td>• Act as an independent oversight function for sub-groups – ensuring that the highest quality deliverables are being created without bias toward any specific technology, sector, or entity</td>
<td></td>
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</tbody>
</table>
NERC Board of Trustees

Reliability and Security Technical Committee (RSTC)

Subcommittees
- Permanent with delegated RSTC functions

Working Groups
- Continuing (1-2 years) functions, but reviewed annually
- Can be promoted to subcommittee

Task Forces
- Assigned a specific work task
- Typically < 1 year duration

Actions
- Approve
- Accept
- Remand
- Endorse

Deliverables
- Reliability Guidelines
- Section 1600 Requests
- Policy Outreach
- White Papers
- Reference Docs / Technical Reports
- Implementation Guidance
- Other as defined by ERO
RSTC Organizational Alignment

- Confirm “classification” (SC, WG, TF)
- Confirm scope is still applicable based on RSTC objectives
- Review membership and identify areas for cross-functional collaboration
- Define reporting cadence for subgroup to RSTC (i.e., annual, ad hoc, etc.)
- Determine level of RSTC engagement (i.e., sponsor assignment) that is appropriate
Processes: Aligning Existing Processes and Defining RSTC Work Management Approach

Existing Processes
- Member/Officer Selection
- Executive Committee
- Voting procedures
- Meeting Minutes
- Reliability Guidelines
- Mandatory Data Requests
- Policy Outreach
- White Papers
- Reference Documents and Technical Reports
- Implementation Guidance

Processes to be Refined
- Workplan development and review (Content / format)
- Subgroup-level work management
- Deliverable scoping
- Deliverable development and report-out
- Subgroup creation and review
- Coordination with RISC

New Processes for Creation
- RSTC Agenda-setting
- Regular status reporting cadence and content (subgroups and industry forums)
- Roles & Responsibilities for RSTC Members, Subgroup leadership, and NERC Coordinators

Defined in RSTC Charter

Transition Team Discussion
Some Drafts in Appendix
Processes: Outlining Subgroup Sponsorship Approach

- Following organizational review, RSTC Sponsor(s) assigned to subgroups where sponsorship is deemed necessary
- Sponsor assignments made with regards to diversity of expertise and sector/technology representation
- Sponsors assignments will be refreshed annually by EC following review of subgroups
- **Sponsors Responsibilities:**
  - Attend at least 2 subgroup meetings per year
  - Schedule quarterly calls with subgroup leadership and NERC Coordinator to review status reports and prepare for RSTC meetings
  - Notify EC if any topics arise which should be on RSTC agenda
  - Advocate and support discussion for Subgroup-Related Topics that arise during RSTC meetings
A Sponsor provides leadership through others to achieve extraordinary results. The Sponsor:

- Delegates accountability to a team leader(s)
- Supports the team leader(s) in gaining and sustaining appropriate skills and talent as members
- Assures a team leader(s) are accountable for delivering the expected results
- Empowers the team(s) to have reach and impact across organizational boundaries
Sponsors are **NOT:**

- A Chair of the working groups, dictating or telling working groups what to do
- Working group members
- Attempting to push their own personal agendas
- Representing the specific organization from which we come (NERC, Regions)
### Draft Roles & Responsibilities Table

<table>
<thead>
<tr>
<th>Process</th>
<th>Subgroup Chair</th>
<th>NERC Coordinator</th>
<th>Subgroup Members</th>
<th>RSTC Sponsor (if applicable)</th>
<th>RSTC EC</th>
<th>RSTC Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subgroup Workplans</td>
<td>Responsible</td>
<td>Support</td>
<td>Support</td>
<td>Provides Direction</td>
<td></td>
<td>Approve</td>
</tr>
<tr>
<td>RSTC Summary Workplan Items</td>
<td>Responsible</td>
<td></td>
<td></td>
<td>Provides Direction</td>
<td></td>
<td>Approve</td>
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<tr>
<td>Quarterly Status Reports</td>
<td>Support</td>
<td>Responsible</td>
<td>Review</td>
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<tr>
<td>Deliverable Scoping</td>
<td>Propose</td>
<td>Support</td>
<td>Support</td>
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<td>Approve</td>
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<tr>
<td>Deliverable Drafting</td>
<td>Oversee</td>
<td>Support</td>
<td>Responsible</td>
<td>Review</td>
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<tr>
<td>Deliverable Approval</td>
<td>Present for Approval</td>
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<td>Approve / Accept / Remand / Endorse</td>
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<tr>
<td>Manage Subgroup Workplan Execution</td>
<td>Responsible</td>
<td>Support</td>
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<tr>
<td>RSTC Agenda Creation</td>
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<td>Consulted</td>
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<tr>
<td>Annual Review of Subgroups</td>
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<td>Approve</td>
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<td>Creation of New Subgroups</td>
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<td>Approve</td>
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<tr>
<td>Development of RSTC Scorecard</td>
<td></td>
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<td>Responsible</td>
<td>Approve</td>
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</tr>
</tbody>
</table>
**Objectives / Metrics: Define Consistent Metrics for RSTC and Subgroups**

**ERO Reliability Indicators**

<table>
<thead>
<tr>
<th>Fewer, Less Severe Events</th>
<th>Compliance Violations</th>
<th>Misoperations Rate</th>
<th>Cold-Weather / Gas Supply-Forced Outages</th>
<th>AC Transmission Forced Outages</th>
<th>Unauthorized Physical / Electronic Access</th>
<th>DCS events greater than MSSC</th>
<th>Interconnection Frequency Response</th>
</tr>
</thead>
</table>

**RSTC Overall Objective:**
Leverage effective industry collaboration to identify risk-based, cost-effective ways to improve / mitigate potential declines in reliability measures

**Draft 2020-2022 Metrics**

**RSTC**
- **Effective Collaboration:**
  - Regular (quarterly) report-outs from industry forums and subgroups on topics relevant to key reliability indicators
  - Identification of 2-3 opportunities per year for cross-functional (security, planning, ops) collaboration on a reliability issue
- **Risk-Based Decision Making:**
  - Review subgroup activities and reduce any activity not focused on high-priority risk items
  - Document and provide highest-priority risk items based on industry feedback to NERC BoT

**Sub-Groups**
- **Effective collaboration:**
  - Ensure representative sector, technology, and function input into all activities
  - Timely completion of deliverables and analyses
- **Risk-Based Decision Making**
  - Include discussion of cost/benefit for any risk-mitigating measures proposed to RSTC
RSTC Transition Structure

- Executive Committee expanded for Transition Planning to incorporate broader perspectives from RSTC
- Team is responsible for preparing transition recommendations for presentation to the RSTC
### Transition Approach: High-Level Timeline for RSTC Transition

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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<tbody>
<tr>
<td>Develop Transition Task Force and High-Level Approach</td>
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<tr>
<td><strong>Strategy:</strong> EC Defines Draft Strategic Objectives</td>
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<tr>
<td><strong>Processes:</strong> Develop detailed roles and responsibilities for RSTC / subgroup leadership</td>
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<td><strong>Processes:</strong> Develop sponsor expectations</td>
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<tr>
<td><strong>RSTC Meeting to Review / Discuss Draft Recommendations</strong></td>
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<td><strong>Organization:</strong> Review of Subgroups – identify future-state structure</td>
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<td><strong>Processes:</strong> Develop consolidated and summary workplan</td>
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<tr>
<td><strong>Processes:</strong> Assign subgroup sponsors and communicate assignments</td>
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<tr>
<td><strong>Metrics:</strong> EC Identifies success metrics for RSTC and sub-groups based on strategic plan</td>
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<td><strong>RSTC Meeting to Review / Approve Recommendations</strong></td>
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<td><strong>Strategy:</strong> Development of RSTC Operational Plan</td>
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<tr>
<td><strong>Processes:</strong> Refine recommendations based on RSTC feedback</td>
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<td><strong>RSTC Meeting to Review / Approve Recommendations</strong></td>
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</tbody>
</table>
Questions and Answers
Appendix:
Draft Deliverables
High-Level Table of Contents for Operational Plan

- Discussion of ERO priorities, mission, vision, values, etc.
- RSTC’s role in achieving ERO priorities as well as any other guiding principles
- Strategic Priorities of RSTC (key activities next three years)
- Ongoing / Annual RSTC Activities
- Placeholder for Scorecard / Metrics
### Template for Organization Review

<table>
<thead>
<tr>
<th>“Legacy” Committ ee</th>
<th>Subgroup</th>
<th>Review of Charter / Workplan</th>
<th>Keep / Consolidate / Disband</th>
<th>New Classification (SC, WG, TF)</th>
<th>Expected “Sunset Date”</th>
<th>Recommended Membership / Scope Changes</th>
<th>Proposed Reporting Cadence / Level of Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>Load Modeling Task Force</td>
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<tr>
<td>PC</td>
<td>SPIDERWG</td>
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<tr>
<td>PC</td>
<td>Reliability Assessment Sub-Committee</td>
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<td>OC</td>
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<td>OC</td>
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<td>CIPC</td>
<td>Supply Chain Working Group</td>
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<tr>
<td>Etc.</td>
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</table>

_This will be pre-populated with the review which has already been conducted by NERC staff and reviewed / validated by Transition Task Force_
## Template for RSTC Summary Workplan – ILLUSTRATIVE

<table>
<thead>
<tr>
<th>Activity</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual / Recurring Items</td>
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<tr>
<td>Reliability Assessment</td>
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<tr>
<td>Event Analysis</td>
<td>▲</td>
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<td>▲</td>
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<tr>
<td>Review of RSTC Subgroups</td>
<td>▲</td>
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<tr>
<td>Key Deliverables</td>
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<tr>
<td>SPIDERWG Reliability Guideline</td>
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<tr>
<td>Supply Chain WG Whitepaper</td>
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<tr>
<td>Key Meetings / Other Milestones</td>
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<tr>
<td>RSTC Meetings</td>
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<tr>
<td>RISC Meetings</td>
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<tr>
<td>Board Meetings</td>
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</tr>
</tbody>
</table>

*Tied to detailed subgroup workplans*
Template for RSTC Status Reports – ILLUSTRATIVE

*Provided / created for all subgroups, forums, and other NERC committees on a quarterly basis*

**[Group Name]**

*Chair & Vice Chair | [Date]*

**Purpose:** Based on group charter

**Recent Activity**
- TBD
- TBD

**Upcoming Activity**
- TBD
- TBD

**Items for RSTC Approval/Discussion:**
- Item, Link, Desired Approval Date

**Workplan Status** (6 month look-ahead)

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milestone 1</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Milestone 2</td>
<td>•</td>
<td></td>
</tr>
</tbody>
</table>

- Green: On Track
- Yellow: Schedule at risk
- Red: Milestone delayed

Bolded items are included on the RSTC Summary Workplan

Include comments for all “yellow” and “red” items
The Working Group Chair:

• Provides leadership, and encourages each group member to be a leader
• Ensures group is creative and innovative, maintain functionality and focus on goals
• Facilitates conversations so each group member has the opportunity to contribute
• Achieves desired results for each meeting, with recommendations and path forward
• Ensures Charter guidelines are met, with expected and timely results
• Assures decisions reflect the group’s point of view rather than opinions of Chair
• Is accountable for and endorses the outcomes of the group
• Maintains powerful and timely communications with other working group Chairs, Sponsors, and others who benefit from the work of their group
• Seeks input from group for proper preparation of agenda and meeting materials
## Objectives / Metrics: Scorecard

### RSTC Scorecard – ILLUSTRATIVE

<table>
<thead>
<tr>
<th>Objective</th>
<th>Metric</th>
<th>Target</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular report-outs from subgroups and forums</td>
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<tr>
<td>Promote cross-functional collaborations</td>
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<tr>
<td>Ensure representative collaboration across subgroups</td>
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<tr>
<td>Timely completion of deliverables</td>
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<tr>
<td>Focus on highest-value activity</td>
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<tr>
<td>Prove report-outs to Board based on RSTC input</td>
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<tr>
<td>Include discussion of cost-benefit for proposed risk mitigation measures</td>
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</tr>
</tbody>
</table>

*On Track*  
*Target at risk*  
*Target will not be met*
2020 ERO Enterprise Reliability Indicators
First Quarter Status

Thomas Coleman, Director of Risk Issue Management
Board of Trustees Meeting
May 14, 2020
• Why is it important?
  ▪ Provides a quantitative measure and trend of actual impacts on the BPS

• How is it measured?
  ▪ Count: Number of Category 3 or above events
  ▪ Trend: Statistical test is performed on the five-year cumulative daily event Severity Risk Index (eSRI) for Category (1-3) events

Data (Annual Measurement)
  ▪ Threshold: No Category 3 or above events: Zero is green, else is red

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?
- Moderate and serious risk noncompliance with a relevant history of similar past conduct*
- The number of violations discovered through self-reports, audits, etc.
- Risk to the BPS based on the severity of Standard violations

Data (Annual Measurement)
- Percent moderate and serious risk violations with relevant compliance history of similar past conduct compared with total noncompliance filed with FERC--- 1%

Data (Annual Measurement)
- Percent of noncompliance self-reported (Self-certified noncompliance is not included)
  ----Current number is 90%

Data (Compared to a 3-year rolling average)
- The number of serious risk violations resolved compared to the total noncompliance resolved
  --- Current number is 1.4%

2020 Status
- 30%
- 20%
- 75%
- 80%
- 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)
  ▪ Includes five years: Q3 2014 through Q2 2019. Five-year average: 8.1258%

2019 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) <em>As of 3/31/2020, Metric status is Green.</em></td>
<td><img src="green-meter.png" alt="" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data (Annual Measurement) (Match with 4.4, year defined as Q3-Q2)</th>
<th>2020 Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>No firm load loss due to gas unavailability: <em>Zero is green, else is red</em> <em>As of 3/31/2020, Metric status is Green.</em></td>
<td><img src="green-meter.png" alt="" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data (Compared to a 5-year rolling average)</th>
<th>2020 Status</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: 0.0058%</em></td>
<td><img src="red-meter.png" alt="" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data (Compared to a 5-year rolling average)</th>
<th>2020 Status</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: 0.1513%</em></td>
<td><img src="red-meter.png" alt="" /></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

Reliability Indicator 5: Reduce AC Transmission Line Forced Outages
• 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 flat compared to a 5-year rolling average (95% Confidence Interval)

2019 Status
  Flat
• 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)
How is it measured?

- Number of vegetation encroachments and Sustained Outages

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 2.2

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 24.4
How is it measured?

- Number of applicable DOE OE-417 Electric Emergency Incident and Disturbance Reports and NERC EOP-004 Event Reports

Data (Compared to 2016-2018 Quarterly Baseline)

- No disruption* of BES operations due to cyber security incidents
  
  *Zero disruptions of BES operations due to cyber attacks in 2020 Q1*

- Number of disruptions* of BES operations due to physical security incidents: Below baseline Upper Control Limit is green, else is red
  
  *Two disruptions of BES operations (one with load outage) due to physical attacks in 2020 Q1*

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

<table>
<thead>
<tr>
<th>Data (Quarterly Measurement), New</th>
<th>4Q2019 Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green</strong>: a time trend line of the most recent 7 years of quarterly DCS events &gt; MSSC has a statistically significant negative slope</td>
<td>No Statistical Trend</td>
</tr>
<tr>
<td><strong>Middle</strong>: no statistically significant trend for the slope</td>
<td>Increasing Trend</td>
</tr>
<tr>
<td><strong>Red</strong>: a time trend line of the most recent 7 years of quarterly DCS events &gt; MSSC has a statistically significant positive slope</td>
<td>Decreasing Trend</td>
</tr>
<tr>
<td><strong>Metric Results through 4Q19: Middle</strong>: DCS data for the most recent 28 quarters shows a negative slope that is not statistically significant</td>
<td></td>
</tr>
</tbody>
</table>
Reiability Indicator 8: Interconnection Frequency Response

• 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
  ▪ Metric Results through 4Q19: No Interconnection experienced a BAL-003-1 event where their IFRM was below their IFRO

2019 Status

Zero is green, else is red
Questions and Answers