

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Reliability and Security Technical Committee Meeting

September 15, 2020

RELIABILITY | RESILIENCE | SECURITY



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RELIABILITY CORPORATION

RSTC Organizational Review Update and Recommendation

Greg Ford, Chair

Reliability and Security Technical Committee Meeting

September 15, 2020

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- 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 while maintaining alignment to overall NERC strategy

- Organize existing RSTC subgroups by Program Areas:
 - Performance Monitoring
 - Reliability and Security Assessment
 - Risk Mitigation
- The Program Areas are NOT subcommittees but rather a simple way to organize work in distinct groups
- Sponsors would be assigned based on subgroup topics and work loads
- The Program Areas are supported by RSTC sponsors and NERC staff and would be responsible for managing work flow/deliverables
- Security is expected to be a consideration for each subgroup where appropriate

Performance Monitoring
Focus: monitoring and analysis

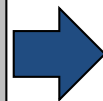
Performance Monitoring Sponsors

Real-Time Operations Subcommittee

Event Analysis Subcommittee

Performance Analysis Subcommittee

Resources Subcommittee



Risk Mitigation
Focus: Mitigate existing and emerging risks

Risk Mitigation Sponsors

IRPWG

SPIDER WG

SWG

SCWG

EMPTF

GMDTF

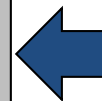
LMWG

SPCWG

PPMVTf

EGWG

SRTWG



Reliability and Security Assessment
Focus: Emerging Issues

Reliability and Security Assessment Sponsors

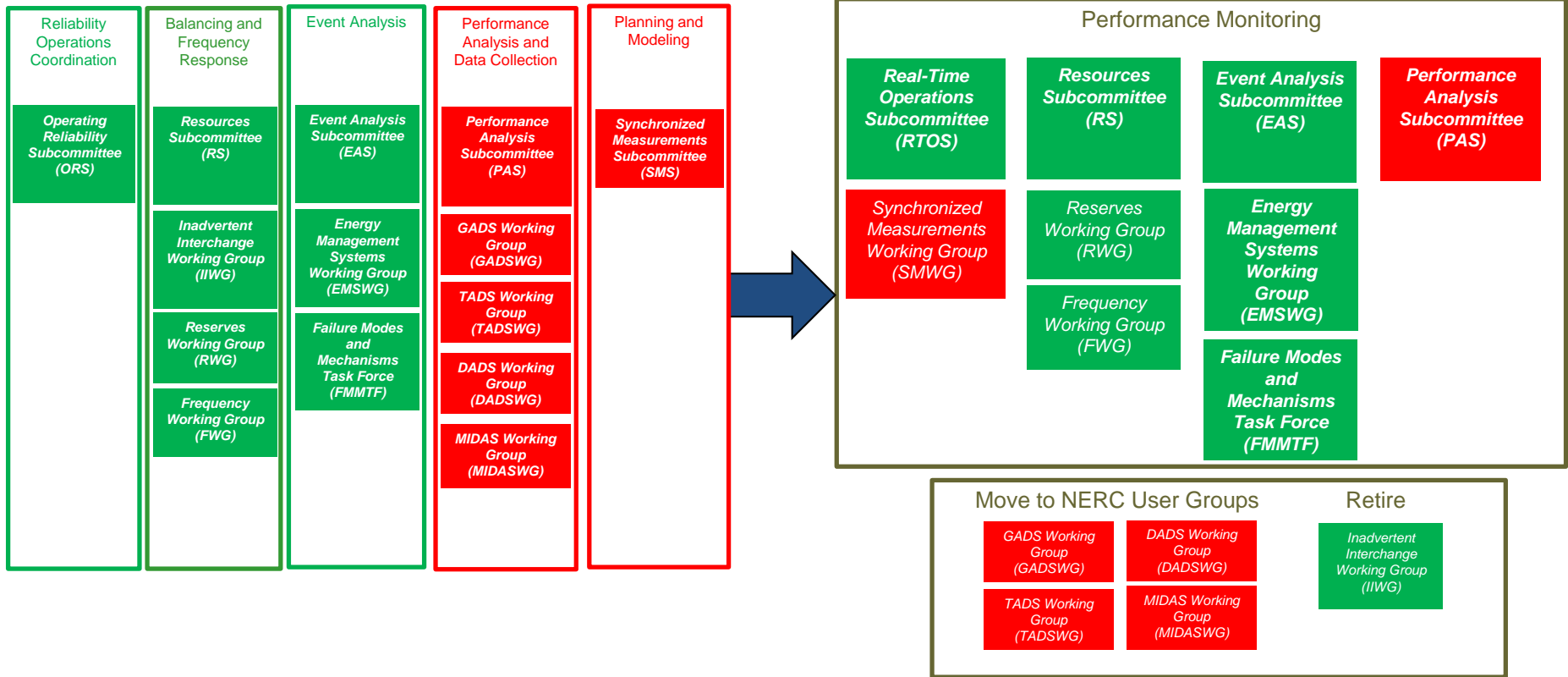
Reliability Assessment Subcommittee

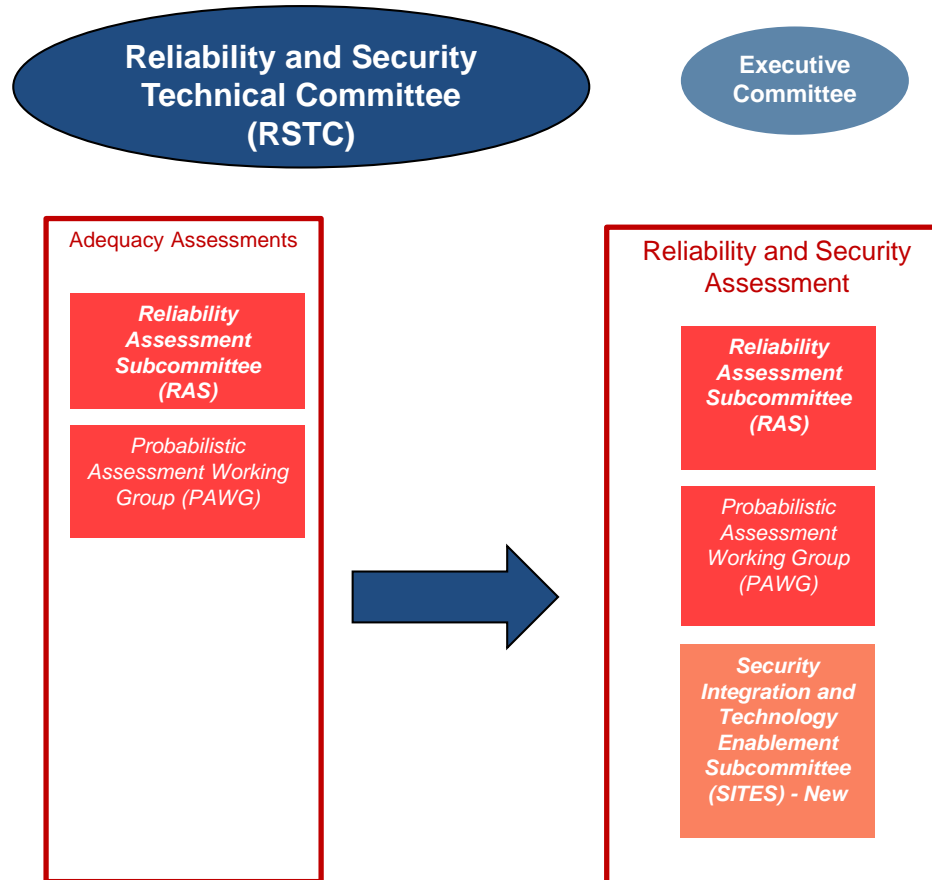
Security Integration and Technology Enablement Subcommittee (New)

Committee Subgroups				
	Scope	Duration	Approvals	Leadership
Subcommittee	<ul style="list-style-type: none"> Oversee broad processes Manage cyclical deliverables 	Long-term	Consensus seeking; vote as specified by its scope	Nominated by subcommittee; Approved by RSTC Leadership
Working Group	<ul style="list-style-type: none"> Oversee specific data systems Support specific initiatives with broader interaction with other subgroups/topics Support a cyclical process Support parent subcommittee 	Long-term/ mid-term	Consensus seeking; non-voting	Nominated by working group, parent subcommittee, or direct appointment by the NERC Technical Committees; approved by RSTC Leadership
Task Force	<ul style="list-style-type: none"> Support a specific initiative Direct, often only one deliverable Support parent subcommittee 	Short-term	Consensus seeking; non-voting	Nominated by task force, parent subcommittee, or direct appointment by the NERC Technical Committees; approved by RSTC Leadership

**Reliability and Security
Technical Committee
(RSTC)**

**Executive
Committee**

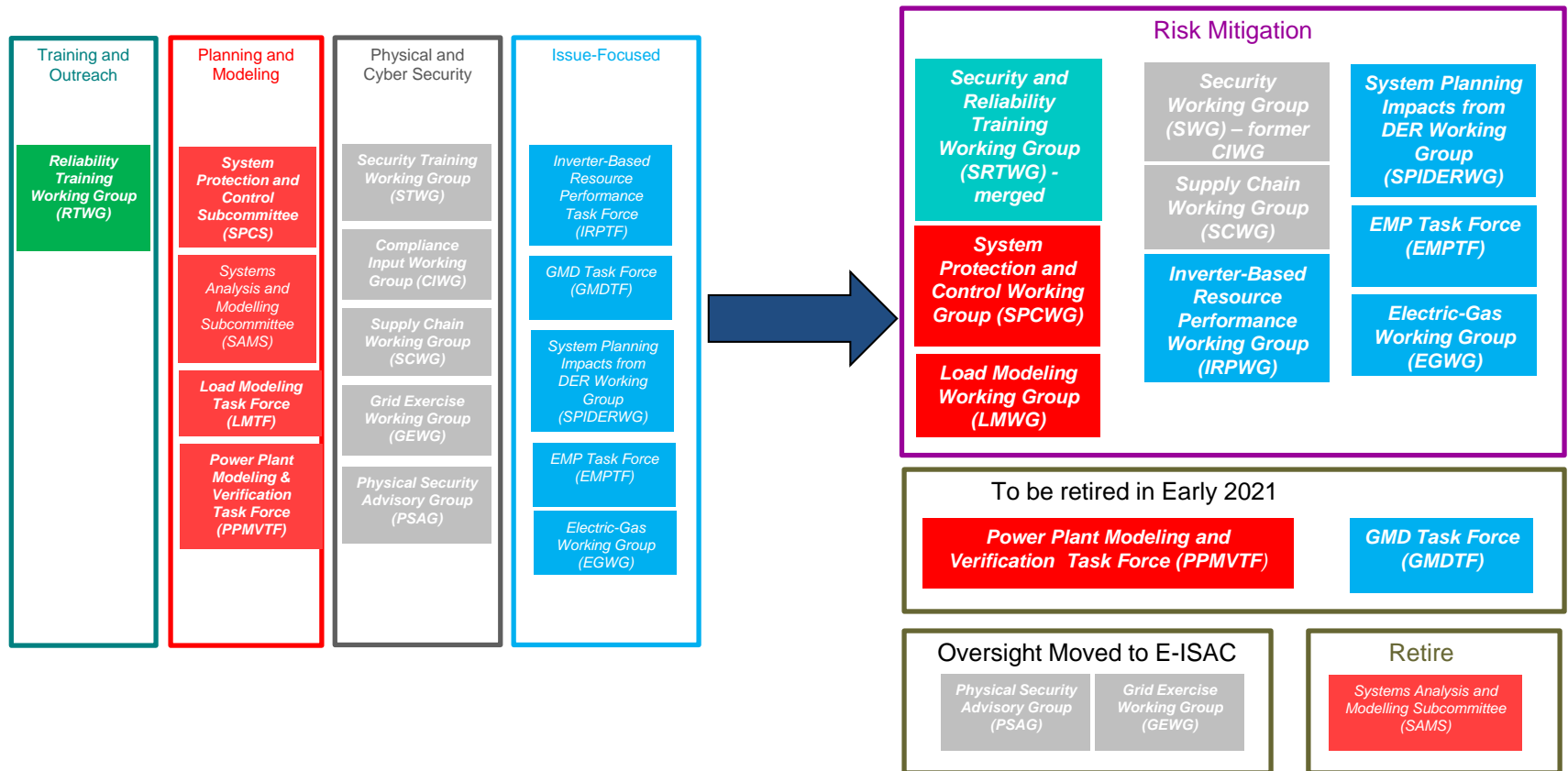




- Reliability and Security Assessment Program Area
- Vetting technology landscape
- Identify barriers to adoption of technology
- Providing a forum for advancing and integrating new technology
- Considering cyber and physical threats more directly in planning, operations, design, and restoration activities
 - Identify solutions that eliminate or mitigate potential reliability, security, and resilience risks to the BPS that could result from an increased cyber-attack surface or improperly implemented technologies
- Identifying and considering potential security threats and emerging risks
 - e.g., DERMS, inverters, supply chain, PMUs

**Reliability and Security
Technical Committee
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Committee**



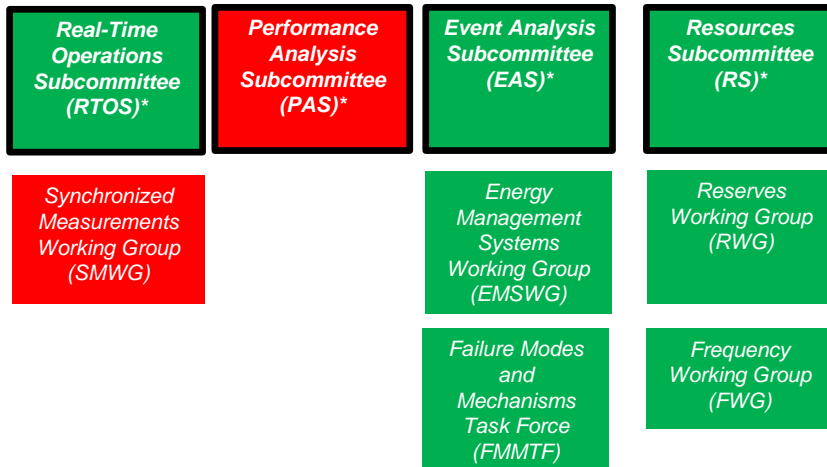
- Risk Mitigation Program Area
- Tactical scope focused on short term security and compliance issues
 - e.g., SARs, recently disclosed vulnerabilities, RISC report items
- Review and develop Security Guidelines and Compliance Implementation Guidance as needed
- Provides expert resources for RSTC groups that need input regarding the security aspects of their respective group's activities
- Coordinate with SITES when security issue impacts operations or planning

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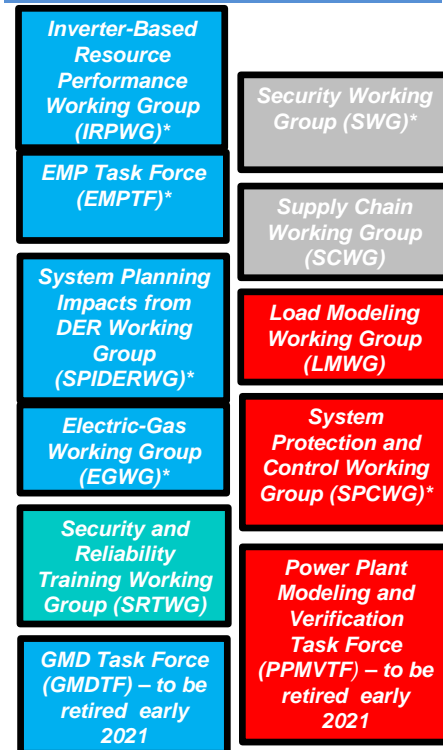
Performance Monitoring

4 sponsors*



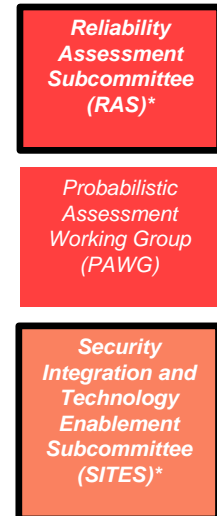
Risk Mitigation

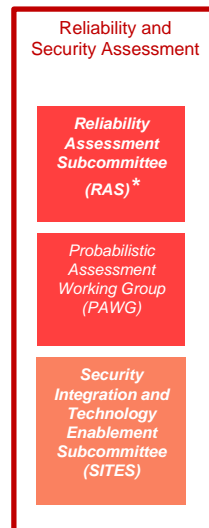
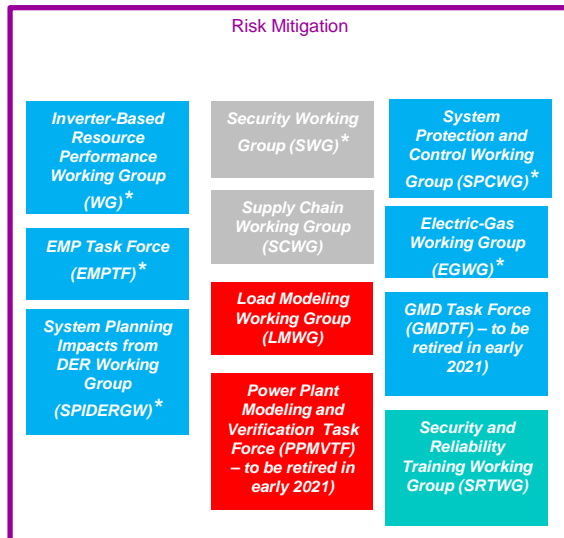
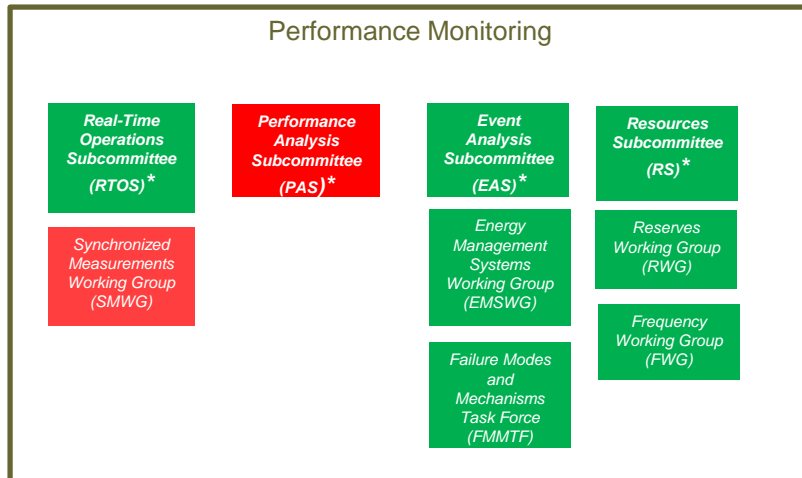
6 sponsors*



Reliability and Security Assessment

2 sponsors*





Sponsors' Assignments

- Following organizational review, RSTC Sponsors will be assigned by the RSTC Executive Committee to each subgroup* with regards to diversity of expertise.
- Sponsors' assignments will be refreshed annually by the RSTC Executive Committee following review of the subgroups

Sponsors' Responsibilities

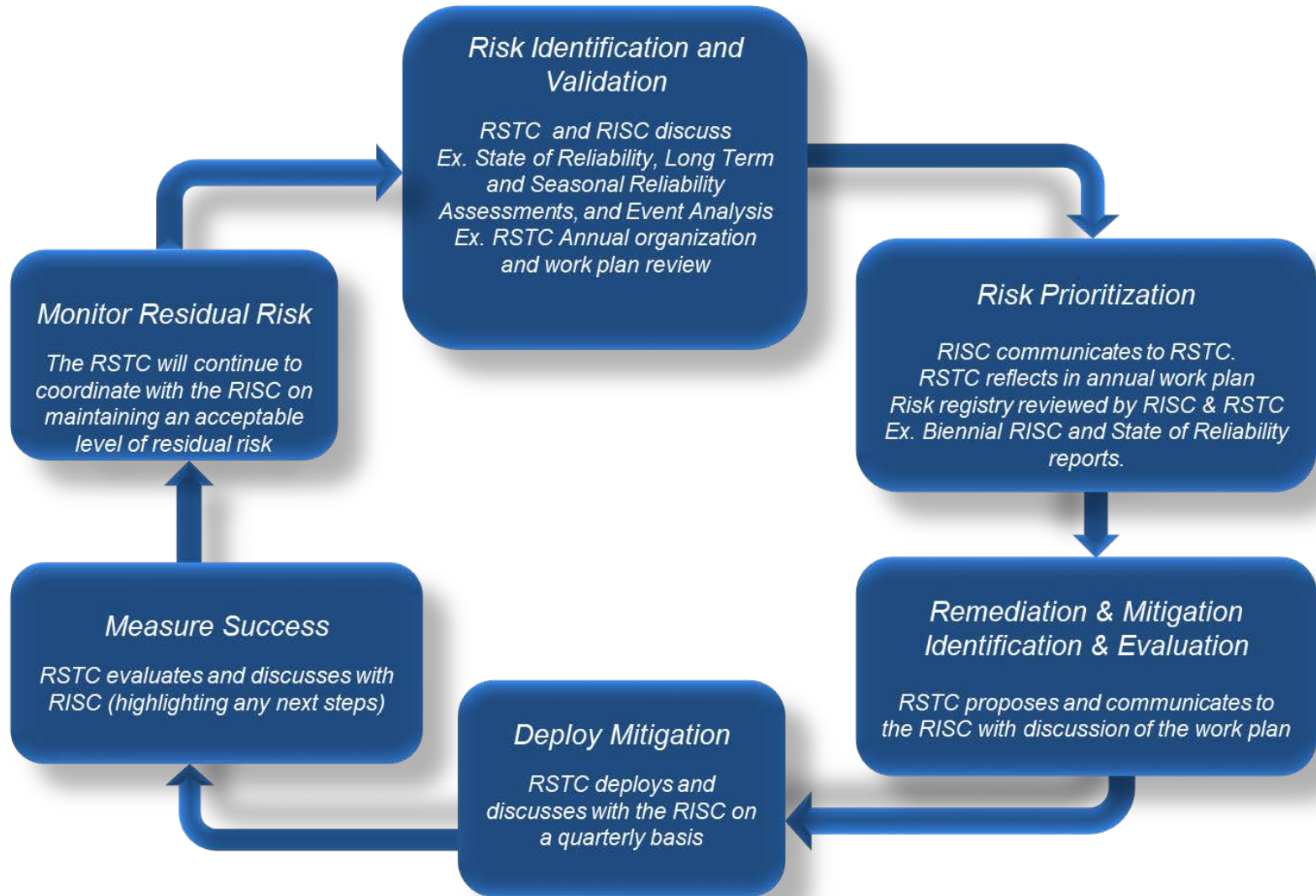
- Sponsors are members of the RSTC but not members of any subgroup
- Attend at least 2 subgroup meetings per year
- Schedule quarterly calls with program area's subgroup leadership and NERC Coordinators to review status reports and prepare for RSTC meetings
- Notify the RSTC Executive Committee if any topics arise which should be on a RSTC agenda
- Advocate and support discussion for subgroup-related topics that arise during RSTC meetings

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)

The Subgroup 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



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



Questions and Answers

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RSTC Organization – Next Steps

Greg Ford, Chair

Reliability and Security Technical Committee Meeting

September 15, 2020

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- RSTC Sponsor training
 - Target dates are October 6-8 and 13-15 via webinar
 - Includes Subgroup Chair, Vice Chair and NERC Staff liaison
 - Specific groups/dates TBD
- Sponsor, Subgroup Chair, Vice Chair and NERC Staff liaison “kick-off” meetings to establish transition plan/timeline for subgroup activities
 - Revise Scope (subcommittee, working group or task force template)
 - Review/Update 2020 work plan
 - Develop 2021 work plan
 - Develop reporting template content
 - Develop metrics where appropriate

- System Modeling and Assessments Subcommittee (SAMS) leadership to coordinate with ERO staff to develop a transition plan to complete their work plan items and transition other work plan items:

Work Plan Item Deliverable	Cyclical?	Transition Plan
1. Node Breaker Planning	No, Long-Term Project started in 2013.	ERO coordinate with interconnection modeling groups (e.g., Eastern Interconnection Reliability Assessments group, WECC, TRE) for transition as needed.
2. Modeling Notifications	Yes	Assign to ERO STAFF
3. NERC Acceptable Models List	Yes	Assign to ERO STAFF
4. Generator Protection Model Implementation and Benchmarking	No	Assign to ERO STAFF
5. Case Creation Practices (MOD-032-1) for Interconnection-Wide Models	No	Assign to ERO STAFF; Case-Creation Designees (TRE, WECC, ERAG/MMWG/EIPC) to complete
6. White Paper: Clarification of "Load Loss" terminology	No	On September 15, 2020 RSTC Agenda for RSTC review. Get clarification as to whether the effort was intended to revise the Glossary of Terms Used in NERC Reliability Standards. Assign to ERO or appropriate working group.
7. Whitepaper: Review of Transient Voltage Recovery and Voltage Dip Criteria	No	Assign to new LMWG as this is a joint task with the current LMTF.

- Operating Reliability Subcommittee (ORS) leadership* to revise scope to change name to Real-time Operating Subcommittee (RTOS) and include the following:
 - Develop transition plan in coordination with GMD Task Force (GMDTF) on transition of work plan items
 - Develop transition plan in coordination with Synchronized Measurements Subcommittee (SMS) to convert SMS to a working group reporting to the RTOS
- GMDTF leadership to develop transition plan to transfer work plan items to RTOS, complete remaining work and dissolve task force

*Leadership includes subgroup Sponsor, Chair, Vice Chair and NERC Staff liaison

- Resources Subcommittee (RS) leadership to develop transition plan to move Inadvertent Interchange Working Groups (IIWG) scope into RS scope.
- Performance Analysis Subcommittee (PAS) leadership to coordinate with ERO Staff to develop transition plan to convert the following working groups to ERO User Groups
 - DADS
 - TADS
 - GADS
 - MIDAS
- Security and Reliability Training Working Group (SRTWG) leadership to develop scope and 2020/2021 work plan for RSTC approval in December 2020

- Security Integration and Technology Enablement Subcommittee (SITES) leadership to refine scope (if applicable) and develop 2020/2021 work plan for RSTC approval in December 2020
- Security Working Group (SWG) leadership to refine scope and develop 2020/2021 work plan for RSTC approval in December 2020
 - Coordinate with other subgroups as necessary
- Power Plant Modeling and Verification Task Force (PPMVTF) leadership develop transition plan to complete work and dissolve the task force
- System Protection and Control Subcommittee (SPCS), Inverter-based Resource Performance Task Force (IRPTF) and Load Modeling Task Force (LMTF) revise scope (template) to become working groups and review/update work plan if needed

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Scope of Security Integration & Technology Enablement Subcommittee (SITES)

Marc Child, RSTC

September 15, 2020

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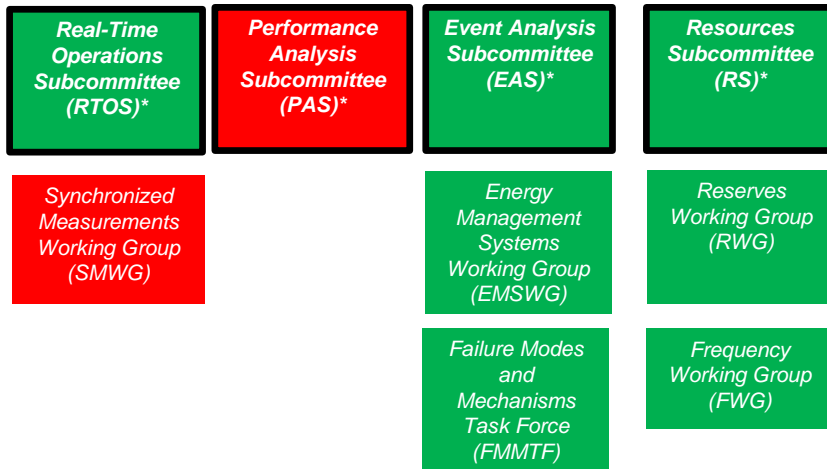


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Committee**

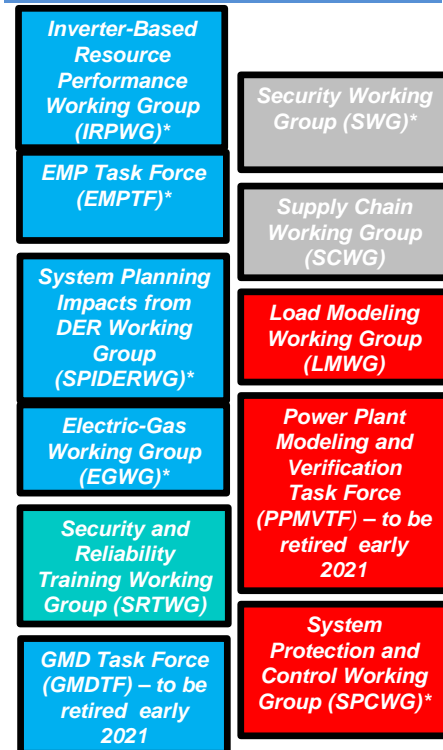
Performance Monitoring

4 sponsors*



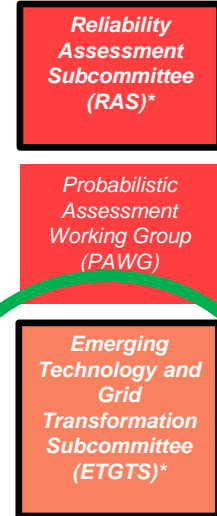
Risk Mitigation

6 sponsors*



Reliability and Security Assessment

2 sponsors*



- Examine technology landscape
- Identify barriers to adoption (regulatory, technical, complexity)
- Considering cyber and physical threats more directly in planning, operations, design, and restoration activities
 - Identify solutions that eliminate or mitigate potential reliability, security, and resilience risks to the BPS that could result from an increased cyber-attack surface or improperly implemented technologies
- Providing a forum for advancing and integrating new technology
 - Leverage government & research partnerships
- Identifying and addressing potential security threats and emerging risks
 - E.g., DERMS, inverters, supply chain, PMUs

- Formerly Compliance Input Working Group (CIPC CIWG)
- Coordinate with SITES when security issue identified by SWG impacts operations or planning
- Focused on specific security and compliance issues
 - e.g., SARs, recently disclosed vulnerabilities, RISC report items
 - Takes input requests from other NERC groups such as SITES (e.g. cloud security and compliance issues)
 - Takes input requests from industry on emerging issues and existing NERC products (e.g. evidence request tool)
- Review and develop Security Guidelines and Compliance Implementation Guidance as needed
- Provides expert resources for RSTC groups that need input regarding the security aspects of their respective group's activities

Motion: Accept the scope document and approve the formation of the Security Integration and Technology Enablement Subcommittee (SITES)



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RSTC Notional Work Flow Process Document

Kayla Messamore

Reliability and Security Technical Committee Meeting

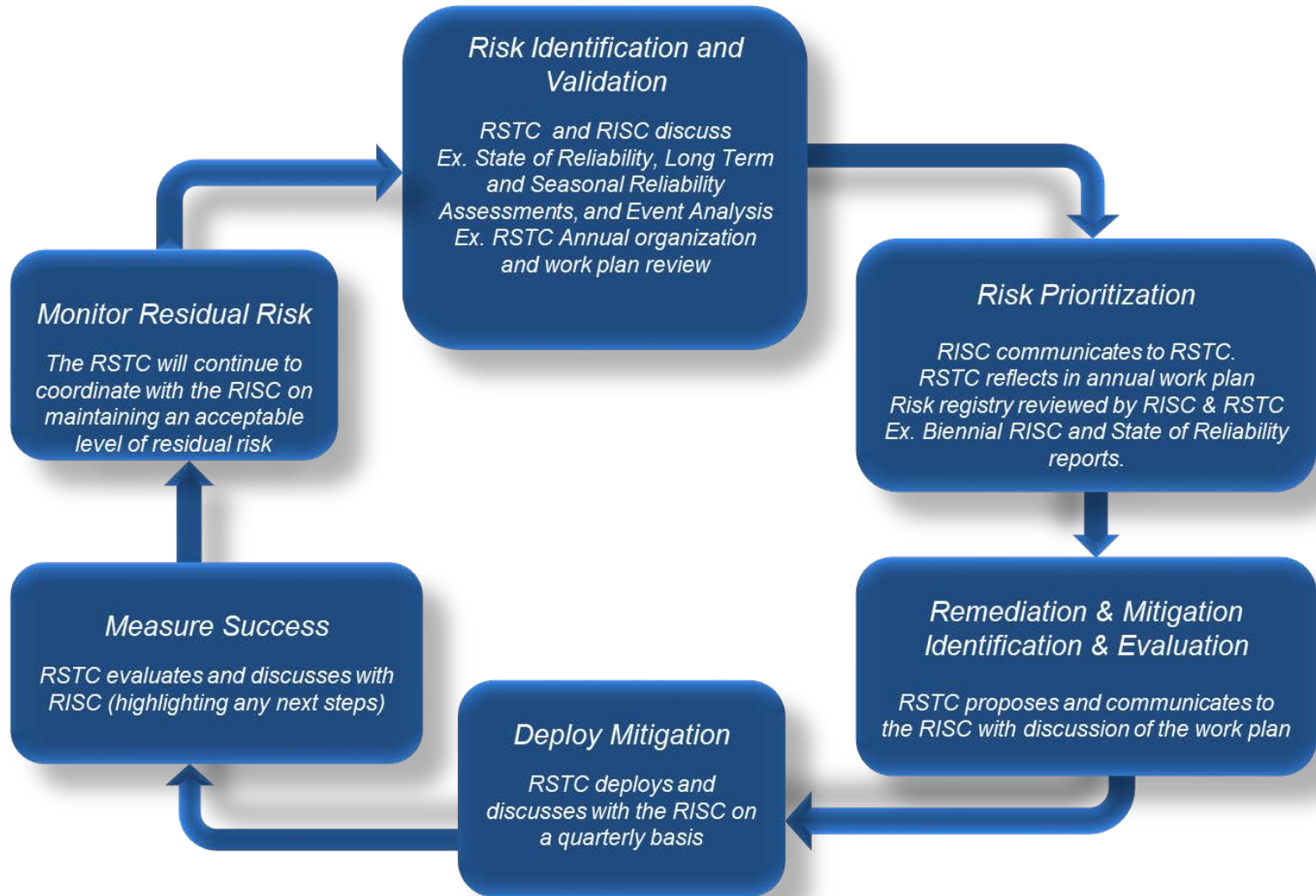
September 15, 2020

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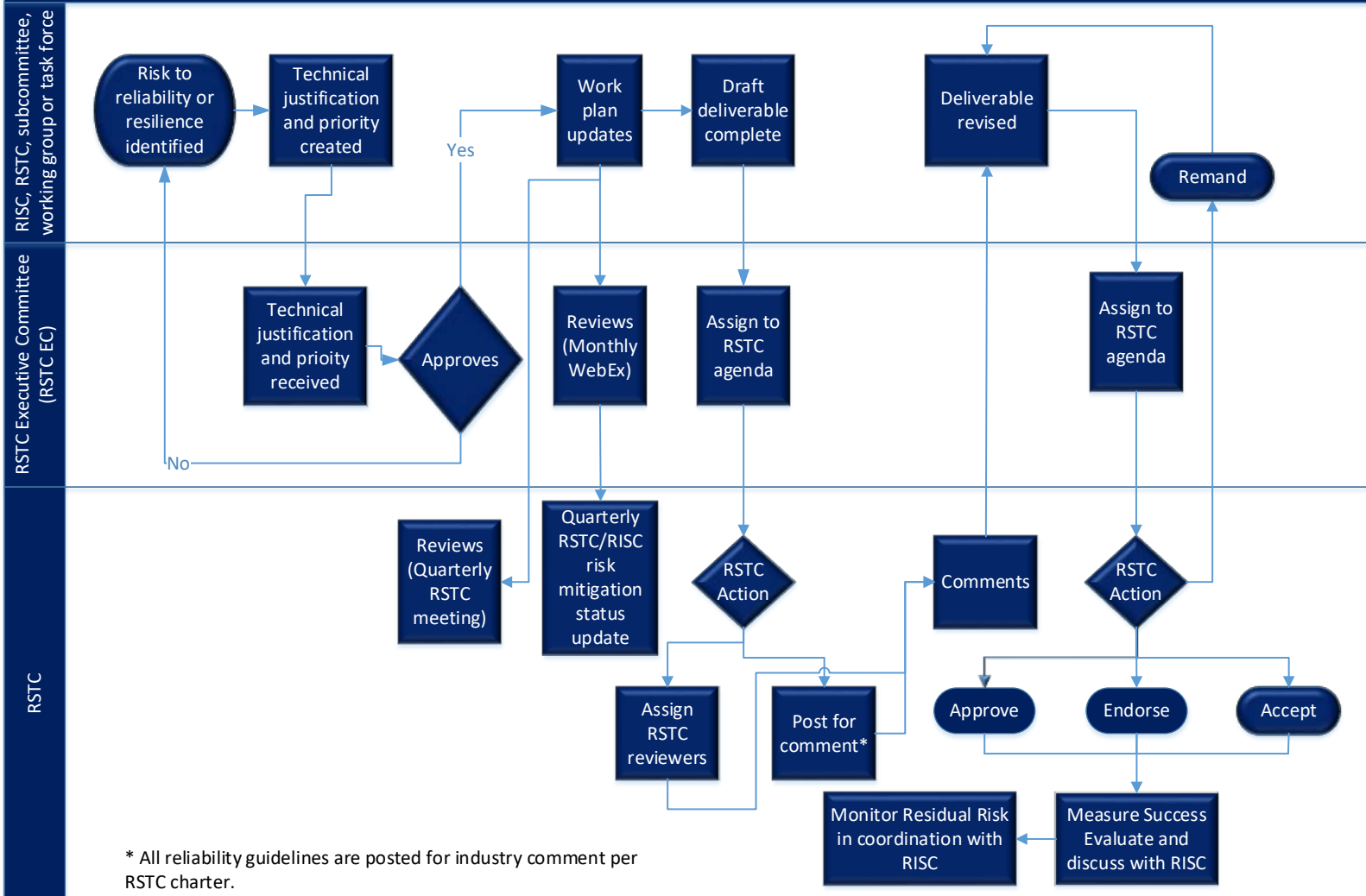


- The Notional Work Product Process document is designed to promote a clear and consistent process for introducing new work items to the RSTC Work Plan
- This process is based on the Planning Committee's Notional Work Product Process and the RSTC/RISC Coordination process
- RSTC Leadership is seeking input from RSTCEC and RSTC members, Technical Group leaders, and RSTC observers on this draft
- Once approved by the RSTC, the work flow process will be added to the RSTC Work Plan as an attachment

- The Notional Work Product Process includes the following broad steps:
 - Risk Identification and Validation
 - Risk Prioritization
 - Remediation and Mitigation Identification and Evaluation
 - RSTC Deploy Mitigation
 - Measure Success
 - Monitor Residual Risk
- The Flow Diagram and Table in the process document provides greater detail on these broad steps
- The process outlines Sponsor roles and will also facilitate coordination within and between Program Areas



Reliability and Security Committee (RSTC) Work Product Notional Process



* All reliability guidelines are posted for industry comment per RSTC charter.

**Motion: Approve the Notional Work Product
Process document**



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Subgroup Sponsors

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Performance Monitoring				Risk Mitigation						Reliability and Security Assessment	
Real-Time Operations Subcommittee (RTOS)	Performance Analysis Subcommittee (PAS)*	Event Analysis Subcommittee (EAS)*	Resources Subcommittee (RS)*	Inverter-Based Resource Performance Working Group (IRPWG)*	Security Working Group (SWG)*	EMP Task Force (EMPTF)*	System Planning Impacts from DER Working Group (SPIDERWG)*	Electric-Gas Working Group (EGWG)*	System Protection and Control Working Group (SPCWG)*	Reliability Assessment Subcommittee (RAS)*	Security Integration and Technology Enablement Subcommittee (SITES)*
Todd Lucas '23	Jeff Harrison '22	Patrick Doyle (6) '23	Rich Hydzik '23	Jodirah Green '22	Christine Hasha '22	Brian Evans-Mongeon '22	Wayne Guttormson '22	Venona Greaff '22	Allen Schriver '23	Kayla Messamore '22	Marc Child '23
At-Large	At-Large	At-Large	At-Large	Sector 7	Sector 10	At-Large	At-Large	Sector 8	Sector 6	Sector 1	Sector 3
East	East	Canada	West	East/West	Texas	East	Canada	Texas	East/West	East	East

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Ensuring Energy Adequacy with Energy-Constrained Resources

Mark G. Lauby, Senior Vice President and Chief Engineer
Reliability and Security Technical Committee Meeting
September 15, 2020

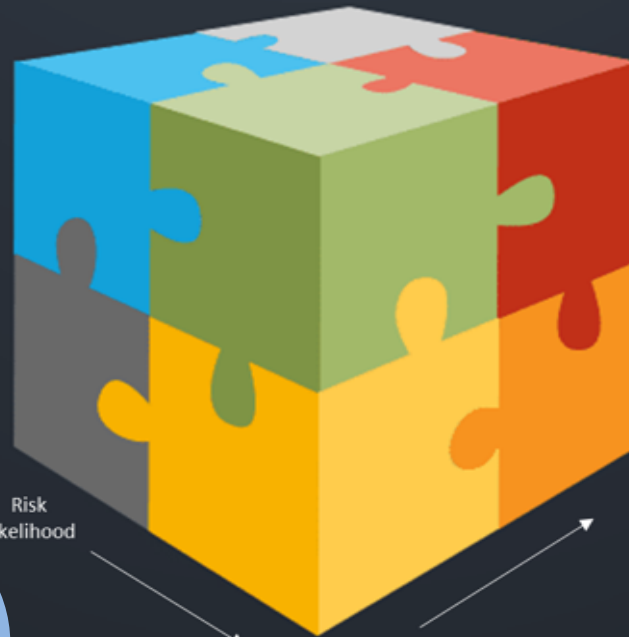
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- Sufficient amounts of energy are needed to meet the energy needs of the end-use consumer
- Historically, industry ensured energy requirements solely through capacity and reserve margins (with adjustment to hydro)
- The Grid Transformation (from RISC) is resulting in a system that has a higher level of energy uncertainty, regardless of fuel type
- The focus needs not to be fuel type, but energy adequacy
- The current tools, rules of thumb, and approaches were not designed to ensure energy adequacy with the types of resources in the transformed grid

- Mid-to-long term planning (1-5 year timeframe)
 - Ensure that resources are planned that can provide options to obtain sufficient and flexible energy resources
 - Review tools, rules-of-thumb and processes to support the need for these energy resources
- Operational planning (1 day to 1 year)
 - Ensure sufficient resources are available and able to provide energy to meet demand and off-set ramping requirements
 - Electrical energy production needs to reflect status of energy availability given the uncertainties
- Operations (0-1 day)
 - Ensure sufficient amounts of capacity, energy, and ramp flexibility are available from available resources

Electric Reliability Organization: Reliability Risk Mitigation Toolkit



Reliability Guideline

Suggested approaches or behavior in a given technical area for the purpose of improving reliability. Guidelines are not enforceable, but may be adopted by a responsible entity in accordance with its own policies, practices, and conditions.



NERC Alert: Level 2-3

NERC alerts are divided into three distinct levels, 1) Industry Advisory, 2) Recommendation to Industry, and 3) Essential Action, which identifies actions to be taken and require the industry to respond to the ERO.



Technical Engagement

Technical Engagement is a catch-all for a variety of technical activity that is conducted between the ERO and entities. This includes, technical committee activities, technical reference documents, workshops and conferences, assist visits, joint and special studies, etc.

Reliability Standards



NERC Reliability Standards define the mandatory reliability requirements for planning and operating the North American BPS and are developed using a results-based approach focusing on performance, risk management, and entity capabilities.

Reliability Assessment



NERC independently assesses and reports on the overall reliability, adequacy, and associated risks that could impact BPS reliability. Long-term assessments identify emerging reliability issues that support public policy input, improved planning and operations, and general public awareness.

NERC Alert: Level 1



NERC Alerts are divided into three distinct levels, 1) Industry Advisory, 2) Recommendation to Industry, and 3) Essential Action, which identifies actions to be taken and require the industry to respond to the ERO.

Define
Adequate
Studies

Require
Adequate
Studies

Take action
for all time
horizons

Energy
Adequacy

Common underlying risk is the increased use of just-in-time delivery of fuel

- A NERC [*reliability guideline*](#) was recently drafted on fuel assurance and fuel-related reliability risk analysis
- A Standard Authorization Request developed for cold weather operation (Operational Planning and Operational timeframe)
- Study is needed mid-to-long-term planning horizon so impacts understood
- Can industry agree on a planning and operating design basis' that will ensure energy sufficiency (e.g. 1 event in 10 years, solar drought impacts)?

- Understanding energy adequacy, and by extension, fuel availability compared to capacity requires advanced consideration of multiple technologies and concepts
- Eleven Questions asked in the whitepaper
- Independent Service Operators (ISOs)/Reliability Transmission Organizations (RTOs) Council (IRC) has considered an earlier version of the whitepaper that did not include the “Standard Requirement” section
- Evaluated each of the eleven questions against the three time frames

- A **common theme** was developed for each set of ISO/RTO responses
- The IRC **grouped and prioritized** the eleven questions. Two higher priority categories were identified
 - 1, 4, 8, 9: “Energy Adequacy and Flexibility for Evolving Resource Mix”
 - 10, 11: “Gas Delivery Security”
- The groupings provide a means to continue with a more detailed analysis. The IRC recommends that the **remaining topics** would be **addressed later** or as they tangentially relate to the existing groupings

- Energy Adequacy and Flexibility for Evolving Resource Mix
 - As the mix of resources trends toward more renewable energy, primarily with variable and intermittent supplies of fuel (e.g. sunshine, wind, and water), maintaining a balanced power system will require a more flexible approach to energy and capacity adequacy in order to maintain operational awareness.
 - Traditionally, peak-hour capacity can be solved in an isolated case that ignores all other hours, but in a limited energy situation, the utilization of system resources affects the availability during peak hours.
 - Generator flexibility is gaining importance as load ramps begin to stress the existing infrastructure.

- Specific items from white paper:
 1. What flexibility is required to balance volatility in resource and load uncertainty through multiple operating horizons and seasons of the year?
 - High Impact in Operations Planning and Operations timeframe, but better evaluated in Mid-Long Term Planning timeframe.
 - The volatility of variable resources in the Operations timeframe have a high impact in areas with high penetration, already requiring greater flexibility
 4. How should the fuel availability / energy adequacy of battery or long-duration storage be evaluated?
 - Gaps in all 3 timeframes, but lower impact currently, due to lower penetration
 - Should be addressed due to projected higher penetration which is still evolving in different regions
 - Seasonal differences of renewable resources will require evaluation to properly define storage requirements (e.g. snowstorms that eliminate the output of solar panels)
 8. Are there new tools needed to address not only the traditional capacity adequacy, but energy adequacy and meeting reliable operational requirements?
 - Gaps across all 3 timeframes
 - New products and tools are needed, including different ramp products for Ops Planning and Operations timeframe
 9. Could strategically overbuilding a similar technology (i.e. solar) augmented by either storage or some portion of the firm capacity fleet (albeit operating at low capacity factors only when needed) provide for a resilient and reliable transition?
 - Gaps in all 3 timeframes
 - This logically extends and adds another level of complexity the question on flexibility required to balance volatility (#1)
 - Daily and seasonal variability of renewable resources should be considered when determining capacity values of the installed resources

- Gas Delivery Security

- Maintaining system balance in cooperation with a limited energy set of resources will require some level of controllability with the remaining fleet, which will most likely be gas fired generation.
- The variability of the renewable resources will likely change how gas is utilized, requiring a higher precision of understanding to determine if the existing system is capable to serve the changing needs (e.g. larger swings of gas demand due to higher overall gas generation ramp rates and shorter periods of online time, burning 24 hours of gas in 8 hours instead of 16)
- Forces external to power system operators may influence gas delivery security, such as policies and procedure developments from FERC, NAESB, natural gas pipeline companies, or other entities

- Specific items from white paper
 10. How should fuel availability through long-term fuel contracts (commodity plus transportation capacity) and on-site storage (e.g. oil, coal and reservoir-based hydro) be incorporated as part of the analysis, looking at a simultaneous demand on transportation capabilities over an extended period?
 - Could be High impact, however ISOs are across spectrum on gaps
 - Additional modeling for fuel security event (e.g. DoE North American Energy Resilience Model (NAERM))
 - Consider the unique characteristics of each operating region
 11. How should gas pipeline disruption scenarios be modeled, realizing that individual gas pipeline design and gas generator interconnections vary, which result in different impacts to the generator and the Bulk Power System.
 - Could be High impact, however ISOs are across spectrum on gaps
 - NERC EGWG Reliability Guideline provides foundation
 - Next steps – studies under NERC umbrella, such as a system-wide hydraulic study, or region-specific studies, but in the context of balancing against variability of renewable resources in terms of energy and ramping capability utilizing the existing infrastructure (e.g. assessing the sustainability of increased ramping on existing infrastructure)

- The path that starts with the white paper and ends with a long-term secure power system in all areas, with **varying degrees of challenges** in all aspects of Energy Adequacy, involves **several diverse disciplines** and a **considerable coordination effort**
- While **all** of the questions will need to be addressed, along with other areas of concern that are discovered as work moves forward, the **groupings** provided by the IRC provide a **starting point** for an initial effort
- Focus should be on how to integrate the developing **limited and variable energy resources**, which will **influence** the gas pipeline services required by gas fired resources to **balance** the variability
- Developing and implementing the proper **metrics, tools** and **operating procedures/protocols** in these key areas first is critical

1. Coordinate energy assurance activities with industry working groups
2. Subject matter experts should be assembled to develop:
 - a. Technical foundation for the three time horizons
 - b. Ways to identify the levels of energy that are required to meet the operational needs
 - c. Tool specifications needed to incorporate energy considerations into planning, operational planning and operations assessments

3. Engage industry R&D organizations (EPRI, DOE, Natural Resources Canada, National Laboratories, etc.) to validate the technical foundation(s) and development of the tool(s) and methods.
4. Coordinate studies and plans with adjacent Balancing Authorities to identify enhanced collaborative regional support.
5. Create a Standard Authorization Request to enhance existing or create new Reliability Standards to address fuel assurance and resulting energy limitations for the planning timeframe



Questions and Answers

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Supply Chain Vendor ID

Industry Pilot Project

Ryan Quint, PhD, PE

BPS Security and Grid Transformation, NERC

Reliability and Security Technical Committee Meeting

September 15, 2020

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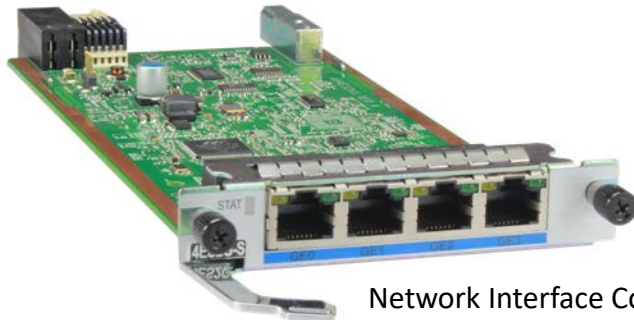


- Security integration into conventional planning, operations, design, and system restoration activities
- Concerted effort to bring security to forefront of our collective efforts to ensure BPS reliability, resilience, and security
- Industry support through coordination with RSTC technical groups, industry partnerships, and E-ISAC
 - Development and sharing of industry best practices
 - Assessments of security landscape
 - Strategic guidance and leadership around improved security coordination
 - Enabling use of emerging technologies
 - Industry support to emerging topics (security and engineering)
- Strictly unrelated to CIP compliance activities

- **2012:** U.S. gov't report assessing security threat posed by Chinese telecommunication companies; recommended against use of equipment manufactured by Huawei or ZTE
- **2013:** U.S. gov't report released highlighting potential ways to exploit vulnerabilities in communications equipment supply chain by injecting malicious code in components
- **2018:** U.S. National Defense Act bars U.S. DOD from using telecom equipment produced by Huawei or ZTE for certain critical programs
- **2019:** Supply Chain Risk II NERC Alert released, gathering information on supply chain risks

- Pervasiveness of these manufacturers across marketplace
 - Partly stems from embedded Huawei or ZTE components in equipment from unrelated vendors
 - Utilities likely using significant amount of telecommunications equipment with Huawei or ZTE (or subsidiary) components
- Supply Chain Risk II NERC Alert sought information on “branded equipment”
- Alert language and the embedded nature of these components may not fully indicate the exposure of the BES to these manufacturers
- FERC and NERC teams developed joint white paper for non-invasive techniques to identify equipment vendors on network

- **Purpose:** Provide approaches on assessing the deployment of foreign adversary components on electric utility OT systems that could be used to impact the BPS.
- **Recommendation:** Industry should use approaches outlined to identify equipment suppliers and implement periodic tests to mitigate potential risks.



Network Interface Controller

Joint Staff White Paper on Supply Chain Vendor Identification -
Noninvasive Network Interface Controller

July 31, 2020

Federal Energy Regulatory Commission
North American Electric Reliability Corporation

The opinions and views expressed in this staff White Paper do not necessarily represent those of the Federal Energy Regulatory Commission, its Chairman, or individual Commissioners, and are not binding on the Commission. Similarly, the opinions and views expressed herein do not necessarily represent those of the NERC Board of Trustees, its chair, or any individual trustee, and are not binding on them.

- White paper details possible noninvasive techniques to identify one component, the network interface controller (NIC)
 - NIC: hardware component that connects computer to a computer network
 - Generally takes form of an integrated circuit chip on motherboard or host bus adapter card
 - Research shows numerous avenues to compromise systems using NICs as a method for undetected access for an attacker
 - NIC is well-known and often-targeted component
- Identification techniques can be employed by security professionals to identify NIC vendors
 - Can easily identify devices often not readily labeled by suspect vendors or that may integrate suspect vendor components
 - Techniques described are not the only methods of detection nor do they encompass the only concerns industry should have about malicious activity and attacks

- NERC seeking industry *voluntary* participation in pilot test of recommendations from FERC-NERC white paper
 - Applying the non-invasive techniques to identify NIC component vendors
 - Recommending to test on *test/development* network
- NERC developing a simple questionnaire to gather further information on extent of possible equipment and components from foreign adversaries
 - Is NOT seeking detailed or attributable information (e.g., IP addresses)
 - IS seeking aggregate information about possible extent of risk
- NERC developing secure data portal to provide responses confidentially under NERC Rules of Procedure
- Strictly unrelated to compliance with NERC CIP standards in any way; voluntary support of overall industry security posture

- NERC gathering list of entities and contacts previously involved in cybersecurity-related activities at NERC
- Will seek *voluntary* participation from wide range of Registered Entities
 - If interested in participating, please reach out to Ryan Quint (ryan.quint@nerc.net)
- Expecting to begin outreach and engagement with industry in October timeframe
- Seeking responses (submitted questionnaires) by end of year

A stylized map of North America, including the United States, Canada, and Mexico. The map is rendered in shades of blue and grey, with the United States and Canada in a darker blue and Mexico in a lighter grey. The map is positioned in the background, partially obscured by a horizontal band.

Questions and Answers

For more information, please contact:

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NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

GMD Data Reporting

Application Update

Donna Pratt and Ian Grant
Reliability and Security Technical Committee Meeting
September 15, 2020

RELIABILITY | RESILIENCE | SECURITY



- Background
- Overview of GMD Data Reporting Application
- Appendix and Reference Slides

- FERC Order No. 830 directs NERC to collect GMD data to “improve our collective understanding” of GMD risk NERC developed the GMD Data Request with GMD Task Force (GMDTF) and technical committee input
 - In August 2018, NERC Board approved Rules of Procedure Section 1600 data request for collecting GMD data
 - Applies to Transmission Owners (TO) and Generator Owners (GO)
- NERC Staff is completing development of the GMD Data Portal for implementation in October 2020
- Reporting entities must report data annually by June 30
 - First collection deadline June 30, 2021

- There are three types of data to be reported :
 - GMD monitoring equipment (GIC Monitor, Magnetometer)
 - GIC measurement data for designated GMD events
 - Geomagnetic field measurement data for designated GMD events
- Data Reporting Instructions describe data fields (format, units, narrative description, etc.) and provide example data

Geomagnetic Disturbance Data System

Welcome to the NERC Geomagnetic Disturbance (GMD) Data System. Users may submit, view, and manage device information and GMD Event data. GMD System Reports provide information on data reported for individual GIC Monitors and Magnetometers. Below is a list of entities for which you have permission to view or submit data. If an entity is not listed, go to the [Application Access Requests](#) page to request access.

The User Guide for the GMD Data System is available [here](#) or on the NERC website by navigating to Program Areas & Departments > Reliability Assessment & Performance Analysis > Geomagnetic Disturbance (GMD) > GMD User Guide for Entities.

For assistance with the functionality of the GMD Data System, please email GMD@nerc.net.

The annual reporting collection period for GMD data is from April 1 – March 31. The reporting deadline for each annual reporting collection period is June 30.

NCR ↑	Entity Name	GMD Role
NCR22222	Test Company 2	GMD Read-Only
NCR33333	Test Company 3	GMD Read-Only
NCR44444	Test Company 4	GMD Submitter
NCR55555	Test Company 5	GMD Submitter

Menu

[GIC Monitor Devices](#)

View, create, manage or bulk import GIC monitor devices

[Magnetometer Devices](#)

View, create, manage or bulk import magnetometer devices

[GIC Monitor Data Reporting](#)

View and submit GIC monitor data reporting submissions

[Magnetometer Data Reporting](#)

View and submit magnetometer geomagnetic data reporting submissions

[Missing Data Report Imports](#)

Bulk import missing data reports

[GMD Reporting Status](#)

View GMD Status Reports

[GMD Events](#)

View GMD events that require reporting

- Data reporting training sessions – Late Sept through Oct
- Go Live – October 2020
- System User training – 2021
 - For System Users to download GMD Data

Appendix



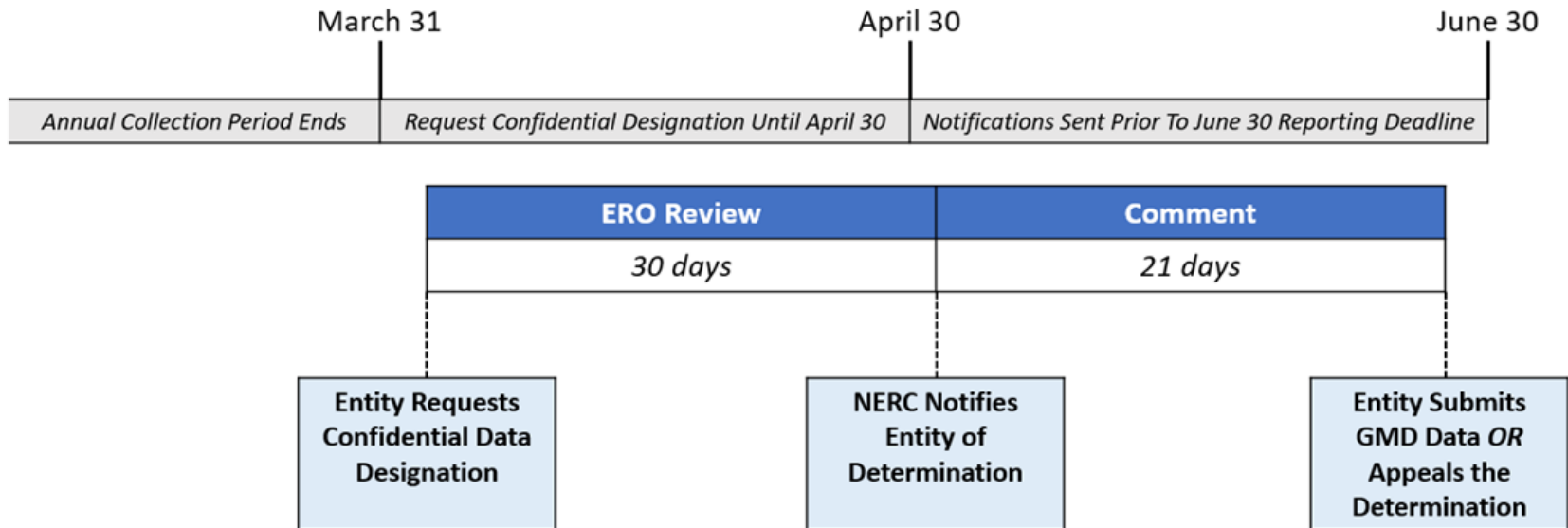
Process for Designating Information as Confidential Information

...as a general matter, the Commission does not believe that GIC monitoring and magnetometer data should be treated as Confidential Information pursuant to the NERC Rules of Procedure. (P 89)

...Notwithstanding [the Commission's] findings here, to the extent any entity seeks confidential treatment of the data it provides to NERC, the burden rests on that entity to justify the confidential treatment. (P 95)

- If a Reporting Entity reasonably believes that any information required to be submitted under the GMD Data Request is Confidential Information, the Reporting Entity shall submit a request for Confidential Information treatment in accordance with FERC's guidance in Order No. 830
 - An entity will request confidential treatment before entering any data
- Data Reporting Instruction Appendix E Contains Guidance
- When data is determined by NERC to be confidential it will be marked accordingly in the data portal by NERC

- Entities submit requests for confidential designation by April 30



- Reporting entities submit Confidential Information designation request by form emailed to NERC (gmdconfidentialrequest@nerc.net)
- Request form will include the following info:
 - Entity Name, NERC I.D., and Contact
 - Date of Request
 - Type of GMD Monitoring Equipment (GIC monitor, magnetometer, both)
 - Device I.D. (if assigned in NERC GMD data system)
 - Narrative Justification providing explanation for why the information should not be released to a GMD data requestor, including:
 - Data fields in the GMD data system that meet Confidential Information definitions in NERC Rules of Procedure Section 1501
 - Category of Confidential Information (e.g., CEII)
 - Specific justification for why the reporting entity believes the information is Confidential Information
 - Date after which the data is no longer considered confidential

- NERC Rules of Procedure Section 1500 Includes the following:

Critical Energy Infrastructure Information (CEII)

CEII means specific engineering, vulnerability, or detailed design information about proposed or existing Critical Infrastructure that (i) relates details about the production, generation, transportation, transmission, or distribution of energy; (ii) could be useful to a person in planning an attack on Critical Infrastructure; and (iii) does not simply give the location of the Critical Infrastructure. See NERC Rules of Procedure Section 1501

1. NERC Performance Analysis (PA) receives a request for Confidential Information designation via email
 - Verifies that all required information has been provided
 - Acknowledges receipt to the submitter
2. PA forwards the request for internal review
 - Includes NERC Security, E-ISAC, Engineering and Legal staff
3. PA sends response letter to submitting entity
4. Response letters include instructions for appeal

- A Reporting Entity that receives a rejection of their request for confidential designation may appeal the determination to FERC or other applicable Governmental Authority. The Reporting Entity shall submit the appeal in writing within 21 days of NERC's notification and provide a copy of the appeal to NERC.
- NERC's determination regarding confidentiality shall be final within 21 days of the decision, unless the Reporting Entity appeals to the appropriate Governmental Authority.

- Data that is designated as Confidential Information will be appropriately marked and can only be viewed by the submitting entity and ERO GMD Data System administrators.
- Other system users, including public data requestors, cannot view, download, or select data that NERC designates as Confidential Information.

A stylized map of North America is centered on the page. The map is divided into three horizontal color bands: a light purple band at the top covering Canada, a dark blue band in the middle covering the United States, and a light grey band at the bottom covering Mexico. The text "Reference Slides" is overlaid in the center of the dark blue band.

Reference Slides

- NERC will also collect historical GIC data for K-7 events dating back to May 2013 (one-time collection)

Table B.1: Historical GMD Events From May 2013 to Present for One-time Reporting

Event ID Number	K _p	Start Date	Time (UTC)	End Date	Time (UTC)
2013E01	7	2013-05-31	15:00:00	2013-06-01	15:00:00
2013E02	8	2013-10-02	00:00:00	2013-10-03	03:00:00
2015E01	8	2015-03-17	03:00:00	2015-03-18	06:00:00
2015E02	8	2015-06-22	03:00:00	2015-06-23	15:00:00
2015E03	7	2015-09-11	03:00:00	2015-09-11	18:00:00
2015E04	7	2015-09-19	18:00:00	2015-09-20	18:00:00
2015E05	7	2015-10-06	18:00:00	2015-10-09	09:00:00
2015E06	7	2015-12-20	03:00:00	2015-12-21	09:00:00
2017E01	7	2017-05-27	15:00:00	2017-05-28	15:00:00
2017E02	8	2017-09-07	21:00:00	2017-09-09	03:00:00
2017E03	7	2017-09-27	15:00:00	2017-09-29	00:00:00
2018E01	7	2018-08-25	18:00:00	2018-08-27	00:00:00

