

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Reliability and Security Technical Committee

2023-2024 Strategic Plan

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RELIABILITY | RESILIENCE | SECURITY



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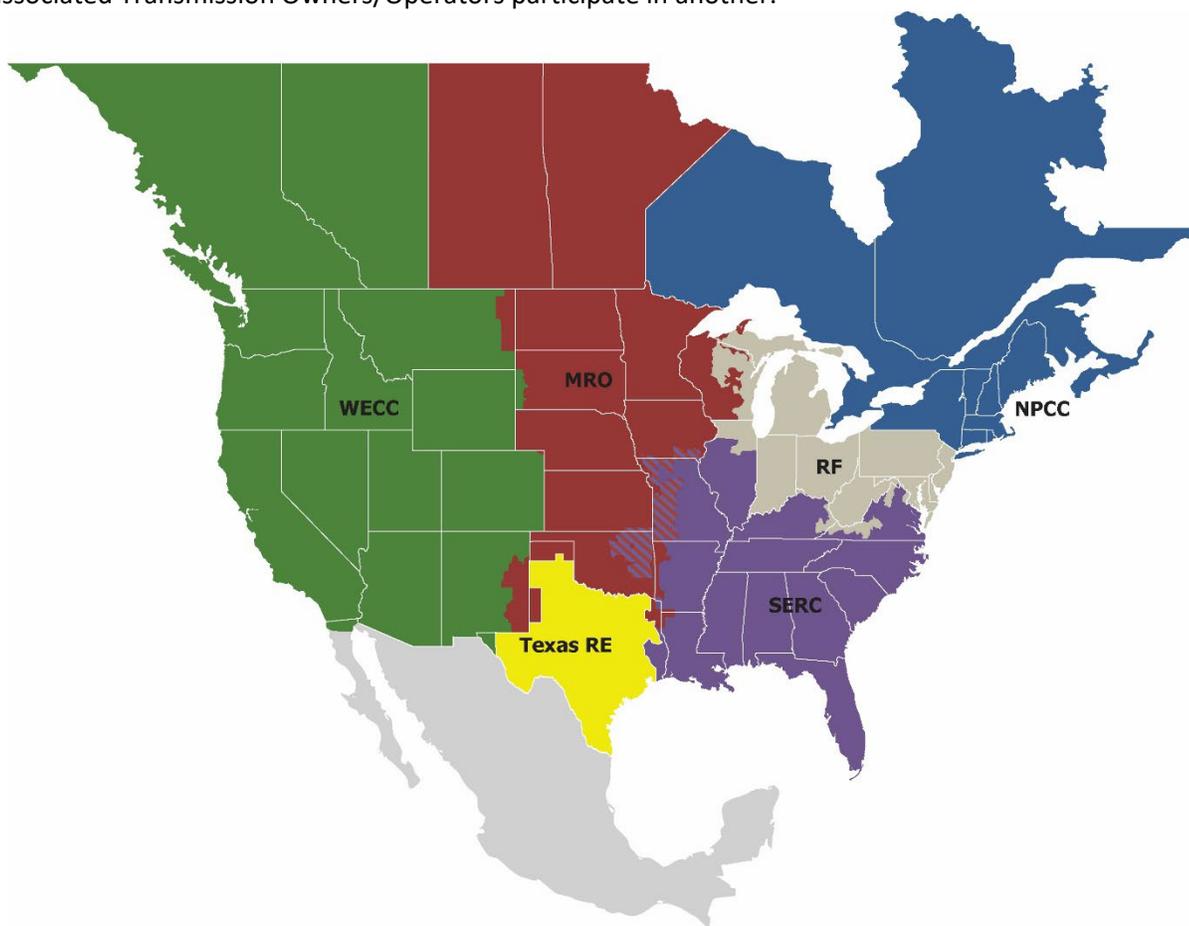
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Preface

Electricity is a key component of the fabric of modern society and the Electric Reliability Organization (ERO) Enterprise serves to strengthen that fabric. The vision for the ERO Enterprise, which is comprised of the North American Electric Reliability Corporation (NERC) and the six Regional Entities, is a highly reliable and secure North American bulk power system (BPS). Our mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid.

Reliability | Resilience | Security
Because nearly 400 million citizens in North America are counting on us

The North American BPS is made up of six Regional Entity boundaries as shown in the map and corresponding table below. The multicolored area denotes overlap as some load-serving entities participate in one Regional Entity while associated Transmission Owners/Operators participate in another.



MRO	Midwest Reliability Organization
NPCC	Northeast Power Coordinating Council
RF	ReliabilityFirst
SERC	SERC Reliability Corporation
Texas RE	Texas Reliability Entity
WECC	WECC

Introduction

The NERC Reliability and Security Technical Committee (RSTC) is a stakeholder committee chartered by the NERC Board of Trustees (Board) to proactively support the NERC ERO Enterprise's mission. The RSTC, in accordance with its charter, will develop and maintain a two-year strategic plan and an associated work plan to carry out the functions of the committee:

- Ensure alignment of the strategic work plan with ERO reports and analyses, including the NERC Business Plan and Budget, ERO Enterprise Long-Term Strategy, biennial Reliability Issues Steering Committee (RISC) ERO Reliability Risk Priorities report, State of Reliability report recommendations, Long Term, Seasonal and Special Reliability Assessment recommendations, and ongoing event analysis trends;
- Coordinate the objectives in the strategic work plan with the Standing Committees Coordinating Group; and,
- Obtain annual NERC Board approval.

This strategic plan guides the functions and core mission of the RSTC, providing a sustainable set of expectations and deliverables for the RSTC to assess and enhance reliability, resilience, and security of the BPS. The RSTC engages in the identification and communication of reliability risks along with potential mitigation strategies. These activities will include close coordination with the RISC as well as taking steps to create industry wide awareness. This strategic plan will not remain static throughout a two-year timeframe. Rather, it is crucial that the plan retain the flexibility to address emerging issues. The RSTC will annually review the goals and specific items or as necessary.

This two-year plan, along with its goals and measures, is typically reviewed during the December RSTC meeting, and enhancements to the plan will be made and presented to the NERC Board each year in accordance with the Charter as required to achieve the goal of promoting reliability, resilience, and security.

Chapter 1: Mission, Vision, and Guiding Principles

Mission

Ensure the reliability and security of the bulk-power system by identifying critical risks and deploying effective and efficient risk mitigations.

Vision

The RSTC is the premier technical authority on BPS reliability, resilience, and security, and its effectiveness stems from the stakeholder members that command deep technical knowledge, broad industry experience, and a collective duty to ensure the reliability of the bulk-power system.

Guiding Principles

The following principles serve to guide our practices:

- Coordinate with the RISC on priorities to align the RSTC strategic plan with ERO's strategic plan.
- Maintain a focus on identification, analyses, and mitigation of existing and emerging reliability, resilience, and security risks.
- Support the Board-approved annual Work Plan Objectives
- Continually strive for the development and dissemination of high-quality lessons learned through event analysis (EA), emerging cause code trending, and information sharing.
- Maintain relationships with other NERC standing committees (e.g. support the Standing Committee Coordinating Group), NERC Forums, and industry trade groups (e.g. NATF, IEEE).
- Maintain and enhance reliability, resilience, and security through the pursuit of clear NERC Reliability Standard Authorization Requests, Reliability Standards, Reliability Guidelines, Security Guidelines, Technical Reference Documents, NERC Alerts, Interpretations, lessons learned, and compliance clarifications.
- Maintain high levels of industry specific expertise to provide sound conclusions and opinions on operating, planning and security issues.
- Incorporate a planning, operations and security perspective into NERC reports issued to industry.
- Deliver technically sound and accurate analyses, assessments, and recommendations;
- Identify critical emerging issues and trends that could potentially have reliability impacts in the near term and long term.
- Ensure the facts are unbiased and not providing an advocacy of policy matters;
- Promote coordination effectiveness across the NERC ERO Enterprise;
- Ensure continued provision of high levels of expertise, technically sound conclusions, and timely results/deliverables;
- Ensure the RSTC structure, processes and procedures, its working relationships with other technical standing committees, its working groups and task forces are focused on the highest priorities for reliability, resilience and security within the ERO enterprise;

Chapter 2: RSTC Strategic Planning Process

The RSTC Strategic Planning Process ensures high priority risks are systematically addressed by the RSTC using a common framework for decision-making with broad concurrence, as well as ensuring all committee members and stakeholders have clear expectations on how the RSTC plans to meet its objectives.

Following the issuance of the RISC report, a Strategic Planning group convenes to conduct the 2-year Strategic Planning Process

The Strategic Planning Process begins with the latest version of the RISC’s Risk Priorities report, which presents the results of strategically defined and prioritized risks, as well as specific recommendations for mitigation. The RSTC provides input into the development of this report and the RISC’s risk assessment through a variety of mechanisms, including reliability assessments and event reports.

The RSTC Strategic Plan (this document) then aligns the highest-priority risks and recommendations from the Risk Priorities Report and with the priorities outlined for the RSTC over the next two years. Additional priorities based on high-priority emerging risks identified by the RSTC may be included within the 2-year Strategic Plan (as determined by the RSTC’s Executive Committee).

Once all priorities are identified for the RSTC, specific risks are identified and RSTC subgroups determine the recommended mitigation steps. These risk mitigation projects, along with programmatic actions, then comprise the detailed RSTC Work Plan. Many of the identified risks share interdependencies that will be considered in the development of the work plan.

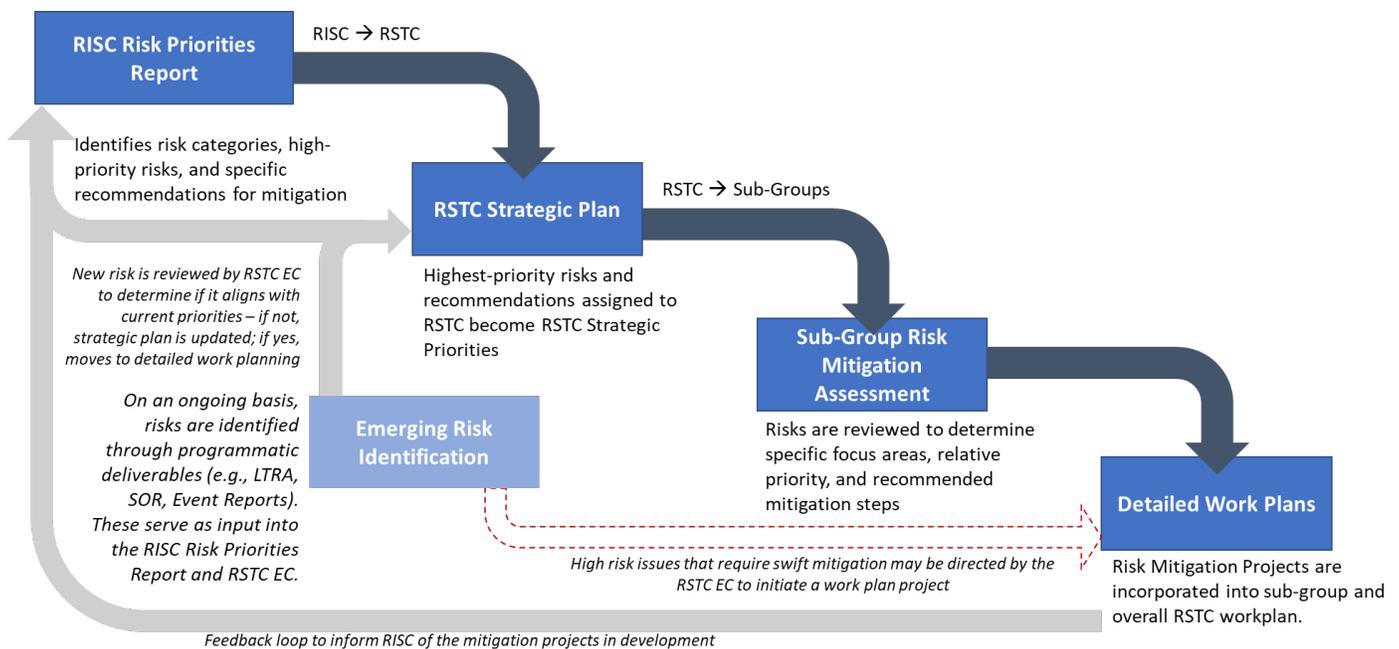


Figure 1: RSTC Strategic Planning Process Flow Chart

RSTC Strategic Plan Role in Risk Mitigation

The RSTC provides expertise in reliability, resilience, and security, and plays a key role in the mitigation of reliability, resilience, and security risks. As identified in the RISC’s Framework¹ for Risk Mitigation, the RSTC is responsible for all steps of the framework, including: Risk Identification and Validation, Risk Prioritization, Determination of Risk Remediation/Mitigation, Deploying Risk Remediation/Mitigation, Measure Success, and Monitor Residual Risk. Therefore, the strategic plan includes key activities to support each of these steps.

The Risk Mitigation Framework guides the ERO in the prioritization of risks and provides guidance on the application of ERO policies, procedures, and programs to inform resource allocation and project prioritization in the mitigation of those risks. Additionally, the framework accommodates measuring residual risk after mitigation that enables the ERO to evaluate the success of its efforts in mitigating risk and provides a necessary feedback mechanism for future prioritization, mitigation efforts, and program improvements.

The successful reduction of risk is a collaborative process between the ERO, industry, and the technical committees including the RSTC and the RISC. The framework provides a transparent process using industry experts in parallel with ERO experts throughout the process—from risk identification and deployment of mitigation strategies to monitoring the success of these mitigations.

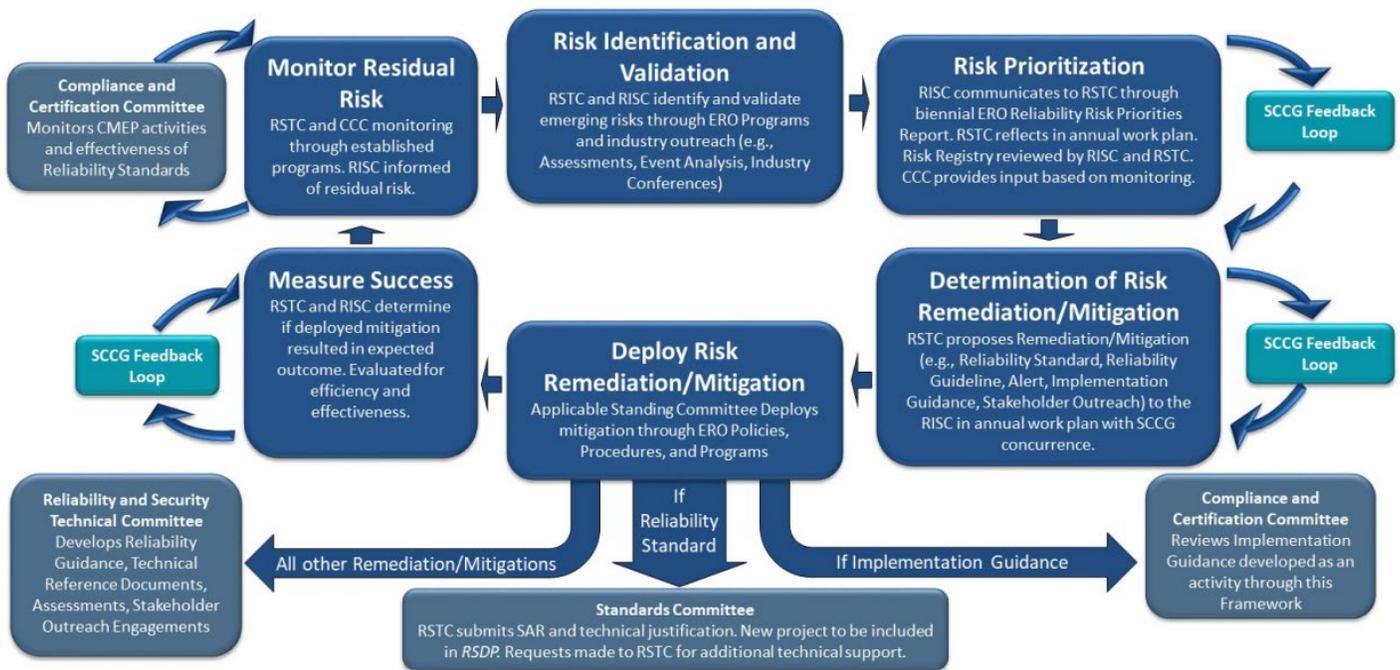


Figure 2: ERO Mitigation Framework for Known and Emerging Reliability Risks

The RSTC’s Notional Work Plan Process² provides a detailed review of each step and how the RSTC supports and actively contributes to the risk mitigation framework. The following table summarizes how the RSTC performs each step and the expected deliverables that support the Risk Mitigation Framework:

¹ https://www.nerc.com/comm/RISC/Related%20Files%20DL/Framework-Address%20Known-Emerging%20Reliabilit-Securit%20%20Risks_ERRATTA_V1.pdf

² https://www.nerc.com/comm/RSTC/Documents/RSTC%20Work%20Plan%20Notional%20Process_Approved_Sept_2020.pdf

Risk Mitigation Framework Steps	RSTC Role	RSTC Deliverable Type
1. Risk Identification and Validation	RSTC identifies and validates risks through its performance, event, and future technical analysis and assessments	<ul style="list-style-type: none"> ● Identification and Monitoring <ul style="list-style-type: none"> ▪ Long-Term and Seasonal Reliability Assessments ▪ Special Assessments ▪ Event and Disturbance Reports ▪ State of Reliability Report ▪ Other reliability/security indicators, whitepapers, gap assessments
2. Risk Prioritization	RSTC provides support and consulting to the RISC prioritization and risk ranking actions.	
3. Determination of Risk Remediation/Mitigation	RSTC proposes remediation/mitigation	<ul style="list-style-type: none"> ● RSTC Biennial Strategic Plan
4. Deploying Risk Remediation/Mitigation	RSTC develops and deploys remediation/mitigation	<ul style="list-style-type: none"> ● RSTC Work Plan <ul style="list-style-type: none"> ▪ Standard Authorization Requests – SAR ▪ Reliability/Security Guidelines ▪ Compliance Guidance ▪ Reliability and Security Assessments ▪ Stakeholder Outreach ▪ Technical Reference Document ▪ NERC Alert
5. Measure Success	RSTC ensures an approach to measure the effectiveness of the risk remediation/mitigation and deploys it. Measurement approach should be included in the approval of the deployed remediation/mitigation.	<ul style="list-style-type: none"> ● Identification and Monitoring <ul style="list-style-type: none"> ▪ State of Reliability Report ▪ Event and Disturbance Reports ▪ Special/Specific Reliability and Security Indicators
6. Monitor Residual Risk	RSTC monitors residual risk through established programs.	<ul style="list-style-type: none"> ● Identification and Monitoring <ul style="list-style-type: none"> ▪ Long-Term, Seasonal, and Special Reliability and Security Assessments ▪ Event and Disturbance Reports ▪ State of Reliability Report

Risk Mitigation Framework Steps	RSTC Role	RSTC Deliverable Type
		<ul style="list-style-type: none"> ▪ Other reliability and security indicators and whitepapers

Determination of Risk Remediation/Mitigation

Technical group, RSTC EC, and Sponsors discuss the reliability/resilience issues, technical justification, and consider possible solutions. Potential outcomes or solutions include deliverables in the RSTC Charter such as white papers, reference documents, technical reports, reliability guidelines, SARs and compliance implementation guidance. Other potential solutions are contained in NERC Rules of Procedure (RoP), ERO Event Analysis Process, NERC Alerts, and other risk management measures. Finally, the RSTC EC authorizes tasks to be added to the RSTC Work Plan (which could include collaboration with other groups), rejects proposed tasks, or refers matter(s) to the RSTC for further discussion.

Chapter 3: Strategic Objectives and Priorities

The RSTC's strategic objectives provide a bridge between the RSTC's mission and vision, and the annual goals and work plan deliverables needed to achieve them. The strategic objectives of the RSTC provide clear expectations of the goals and deliverables of the committee and its subgroups, and are not expected to change often. However, the risk priorities and the expected work products may change, as needed. The five strategic objectives of the RSTC are:

1. Drive effective mitigation actions against emerging and established reliability and security risks, specifically targeting risk priorities.
2. Promote and increase stakeholder and regulator engagement and awareness.
3. Learn from events and past performance trends and deploy mitigation.
4. Identify and assess long-term planning and emerging reliability and security risks.
5. Make recommendations and develop solutions that support technology and security integration into BPS planning and operations.

To achieve these objectives, the RSTC uses its subgroups (subcommittees, task forces, and working groups) to develop its work products. The subgroups are organized under three groupings: Performance Monitoring, Risk Mitigation, and Reliability and Security Assessment.

There are two types of key projects included in the RSTC work plan to support these five strategic objectives:

1. **Programmatic:** Periodic, cyclical, or continuous actions, deliverables, and processes that support the identification, prioritization, and monitoring of reliability risks. The RSTC's **Performance Monitoring** and **Reliability and Security Assessment** subgroups primarily serve to support programmatic strategic objectives.
2. **Priority Risk:** Targeted and focused actions to identify and develop specific reliability risk mitigations. The RSTC's **Risk Mitigation** subgroups primarily serve to support the risk priority mitigation objectives. This also includes emerging risks identified between strategic planning periods (from assessments, disturbance reports, etc.).

Programmatic

1. **Identify key areas of concern, trends, and emerging reliability issues by periodically assessing system reliability and performance.**

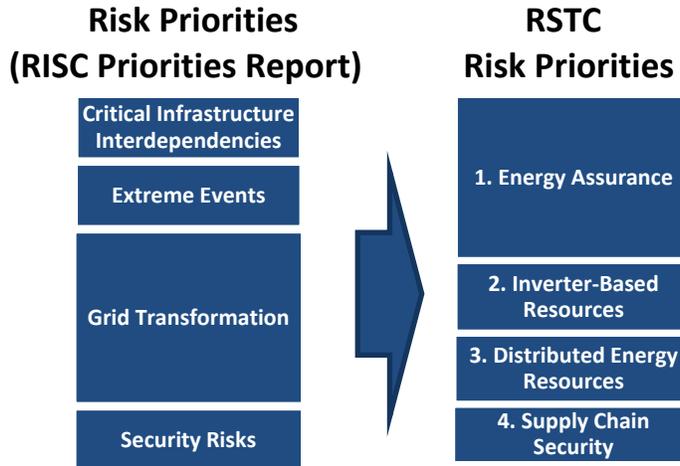
The RSTC will focus on developing reliability assessments, evaluations, and studies, and extracting insights to identify reliability, resilience and security risks. By identifying and quantifying emerging these risks, the RSTC is able to craft risk-informed recommendations and provide the basis for actionable risk mitigations. The RSTC supports this process primarily through the Reliability Assessment Subcommittee (RAS), Performance Analysis Subcommittee (PAS), and Resources Subcommittee (RS). Primary deliverables include:

- **Long-Term Reliability Assessment (annually):** 10-year outlook of resource and energy adequacy, resource and transmission projections, and leading indicators. Emerging reliability and security integration issues are identified.
- **Seasonal Reliability Assessments (annually):** Summer and winter season operational outlook, projection, and leading indicators.
- **Special Reliability Assessments (ad-hoc):** topical technical evaluation of a specified reliability risk.
- **State of Reliability Report (annually):** Historical performance, evaluating 5-year (or longer) trends, indicators, and lagging metrics.

- **Frequency Response Annual Analysis (annually):** Historical performance of frequency response and per a Federal Energy Regulatory Commission (FERC), Canadian Federal or Provincial directive.
- 2. Identify lessons learned and trends based on system events and make recommendations for improvement.**
- The RSTC will focus on event prevention or mitigation by supporting and continually enhancing the ERO’s EA program to ensure a comprehensive process, as well as rapidly developing and disseminating lessons learned. Through the Event Analysis Subcommittee (EAS), the RSTC approves any changes to the EA Process and reviews periodic event reports and lessons learned. Any mitigation actions for the ERO to pursue or recommendations for industry can result in additions to the RSTC work plan and, depending on the outcomes of the risk assessment, may be added to the strategic objectives. Primary deliverables include:
- **Event and Disturbance Reports (*ad-hoc*):** Event reports detail specific details and root causes of BPS events. The EA Process is approved by EAS, and individual reports are published by the ERO and serve as input to the RSTC.
 - **Lessons Learned (*ad-hoc*):** Identified best practice or revealing reliability risk based on an event or group of events. Lessons Learned documents are published by the ERO and serve as input to the RSTC.
- 3. Promote and increase stakeholder engagement and awareness of reliability risks.**
- The RSTC will continue to promote outreach to stakeholder and policy making organizations on reliability, resilience, and security matters through webinars and in-person conferences, workshops, and other mediums to deliver content and reliability messages. The RSTC will leverage strong relationships with industry groups, such as NERC’s Forums (e.g. NATF, NAGF), IEEE, and EPRI as well as regulatory and governmental authorities, to target specific technical areas of concern and work together on industry outreach. Primary engagements include:
- **Reliability Conferences and Workshops (*ad-hoc*):** Convene industry to share and exchange ideas and practices that promote reliability in a variety of technical areas. Conferences can support the RSTC’s mission by “creating a forum for aggregating ideas and interests, drawing from diverse industry stakeholder expertise, to support the ERO Enterprise's mission.”
 - **Webinars (*ad-hoc*):** Virtual information sharing and exchange provides opportunities to quickly engage industry and achieve our collaboration goals. Webinars serve an integral function of providing insight and guidance by disseminating valuable reliability information to owners, operators, and users of the BPS.

Priority Risks

Based on the Risk Priorities identified by the RISC, the RSTC has identified four strategic priorities: 1) energy assurance, 2) inverter-based resources, 3) distributed energy resources, and 4) supply chain security. Cyber security is integral to each of these strategic priorities.



Future actions by the RSTC on the Risk Priorities are focused on the risk mitigation and deployment parts of the Framework for Risk Mitigation. Through this strategic plan, primary subgroups are identified and tasked with identifying risk mitigation solutions (e.g., Reliability Standard, Reliability/Security Guideline) and working with the RSTC EC and subgroup sponsors to add the risk mitigation projects to the RSTC Work Plan. The RSTC EC authorizes projects to be added to the RSTC Work Plan (which could include collaboration with other groups), rejects proposed tasks, or refers matter(s) to the RSTC for further discussion. For each RSTC Risk Priority, a 2-Year plan is detailed below indicating strategic direction, specific risks, mitigation approaches, and the relative priority.

1. Energy Assurance

Unassured fuel supplies, including the timing and inconsistent output from variable renewable energy resources, fuel location, and volatility in forecasted load, can result in insufficient amounts of energy on the system to serve electrical demand and ensure the reliable operation of the BPS throughout the year.³ The RSTC and its subgroups will ensure modeling requirements include needed information and data to support valid and accurate modeling and representation to enable reliable operations of BPS, as well as resource and energy planning.

The RSTC will develop methods, processes, tools, and/or SARs that are needed to address energy security – factoring in extreme events and critical infrastructure interdependencies.

RISK FRAMEWORK ACTIONS				
Identified Specific Risks	Technical Areas of Focus	Primary Subgroups	Risk Mitigation Determination	Develop and Deploy Risk Mitigation
Insufficient assessment of energy supplies to ensure operational awareness and energy availability.	<ul style="list-style-type: none"> Modeling and data sharing requirements System Operations Probabilistic resource planning 	ERATF RAS RTOS	<ul style="list-style-type: none"> SAR for Reliability Standards (submitted in 2022) 	<ul style="list-style-type: none"> Provide technical support to the Standards Drafting Team Enhancement to Reliability Assessment Process
Insufficient assessment of energy supplies to evaluate resource requirements in the long-term planning horizon.	<ul style="list-style-type: none"> Modeling and data sharing requirements Probabilistic resource planning 	ERATF RAS PAWG	<ul style="list-style-type: none"> SAR for Reliability Standards (submitted in 2022) 	<ul style="list-style-type: none"> Provide technical support to the Standards Drafting Team Enhancement to Reliability Assessment Process

³ <https://www.nerc.com/comm/RSTC/ERATF/ERATF%20Energy%20Adequacy%20White%20Paper.pdf>

2. Inverter-Based Resources

The electric power grid in North America is undergoing a significant transformation in technology, design, control, planning, and operation. These changes are occurring more rapidly than ever before. Particularly, technological advances in inverter-based resources are having a major impact on generation, transmission, and distribution systems. The speed of this change continues to challenge grid planners, operators, and protection engineers. Implemented correctly, inverter-based technology can provide significant benefits for the BPS; however, events have shown that the new technology can introduce significant risks if not integrated properly. Further attention is needed to settings of controllable devices, protective relays, remedial action schemes, and power electronics installed to stabilize the system. FERC also published two issuances in November of 2022 pertaining to inverter-based resources and their reliable integration into the BPS.

The ERO has established a strategy that outlines steps NERC and the Regional Entities will take to mitigate risks associated with the integration of large amounts of IBR.⁴ The RSTC will support this strategy by focusing on the improvement of IBR interconnection, planning studies, and operations, as well as staying abreast of new inverter technologies and risks. Over the next two years, the RSTC will be focused on determining the risk mitigations for some risks, while developing and deploying risk mitigations for others.

RISK FRAMEWORK ACTIONS				
Identified Specific Risks	Technical Areas of Focus	Primary Subgroups	Risk Mitigation Determination	Develop and Deploy Risk Mitigation
Insufficient or inaccurate modeling, data, and/or study requirements to ensure adequate planning, protection, and operation of the BPS	<ul style="list-style-type: none"> Modeling and data sharing requirements Systemic modeling errors in positive sequence dynamic models 	IRPS EAS PAS RTOS SPCWG RAS RS ERATF SITES	<ul style="list-style-type: none"> Reliability Guideline SAR 	<ul style="list-style-type: none"> Reliability Guidelines <ul style="list-style-type: none"> Interconnection Studies Guideline MOD-032 action plan Technical support to Standards Drafting Teams <ul style="list-style-type: none"> EMT Modeling SDT (submitted 2022) PRC-024 SDT
Insufficient evaluation of the potential impacts of IBRs by planning authorities	<ul style="list-style-type: none"> Long-term planning studies 	IRPS	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Technical support to Standards Drafting Teams <ul style="list-style-type: none"> EMT Modeling SDT (submitted 2022) Reliability Guidelines EMT Modeling (2023)

⁴ https://www.nerc.com/comm/Documents/NERC_IBR_Strategy.pdf

RISK FRAMEWORK ACTIONS				
Identified Specific Risks	Technical Areas of Focus	Primary Subgroups	Risk Mitigation Determination	Develop and Deploy Risk Mitigation
Insufficient evaluation of the potential impacts of IBRs by Reliability Coordinators and Balancing Authorities	<ul style="list-style-type: none"> Real-Time Assessments 	<p>RTOS</p> <p>EAS</p>	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Technical support to Standards Drafting Teams Reliability Guidelines White Paper
Insufficient interconnection requirements or inability to enforce interconnection requirements for IBRs	<ul style="list-style-type: none"> Inaccurate models and insufficient studies for IBR interconnections Abnormal performance issues with IBRs 	<p>IRPS</p> <p>RS</p>	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> SAR for Reliability Standard <ul style="list-style-type: none"> FAC-001/FAC-002 SAR (2023)
Enhancements needed for identification of IBR events	<ul style="list-style-type: none"> Event analysis 	<p>IRPS</p> <p>RS</p>	<ul style="list-style-type: none"> Gap analysis of emerging risks not addressed by Reliability Standards 	<ul style="list-style-type: none"> SAR for Reliability Standard EOP-004 SAR (December 2022)
Need for electromagnetic modeling and studies for IBRs	<ul style="list-style-type: none"> IBR modeling and studies 	<p>IRPS</p>	<ul style="list-style-type: none"> Reliability Guidelines 	<ul style="list-style-type: none"> Reliability Guidelines <ul style="list-style-type: none"> EMT Modeling (2023)
Inadequate analysis of abnormal performance issues by IBR GOs	<ul style="list-style-type: none"> Post-event performance validation 	<p>IRPS</p> <p>RS</p> <p>PAS</p>	<ul style="list-style-type: none"> SAR for Reliability Standard (submitted in 2022) 	<ul style="list-style-type: none"> SAR for Reliability Standard <ul style="list-style-type: none"> Proposed new standard (December 2022)
Growing need for grid forming inverter technology	<ul style="list-style-type: none"> Changing resource mix Grid transformation 	<p>IRPS</p>	<ul style="list-style-type: none"> White Paper 	<ul style="list-style-type: none"> White Paper <ul style="list-style-type: none"> Grid Forming for BESS Paper
Need for enhanced commissioning practices	<ul style="list-style-type: none"> Plant commissioning Interconnection process 	<p>IRPS</p> <p>RS</p>	<ul style="list-style-type: none"> White Paper 	<ul style="list-style-type: none"> White Paper <ul style="list-style-type: none"> Commissioning White Paper SAR for Reliability Standard

RISK FRAMEWORK ACTIONS				
Identified Specific Risks	Technical Areas of Focus	Primary Subgroups	Risk Mitigation Determination	Develop and Deploy Risk Mitigation
				<ul style="list-style-type: none"> FAC-001/FAC-002 SAR (2023)
Emerging IBR reliability risks	<ul style="list-style-type: none"> Changing resource mix Grid transformation 	IRPS	<ul style="list-style-type: none"> White Paper 	<ul style="list-style-type: none"> White Paper <ul style="list-style-type: none"> Gap analysis of emerging IBR issues not addressed by NERC standards

3. Distributed Energy Resources

Distributed energy resources (DERs) levels are rapidly growing across many areas of North America and are impacting how the BPS is planned, designed, and operated. This influx of DERs presents potential benefits as well as challenges for grid reliability, resilience, and security as they are potentially impactful users of the BPS. While each individual DER is distribution-connected, the priority is focused on the reliable operation of the BPS, and the potential impact of aggregated DERs.

The ERO is proactively identifying and addressing BPS reliability impacts with increasing levels of DERs, and the RSTC will support this effort through collaborative engagement with industry stakeholders to drive risk mitigation activities—specifically, DER modeling capabilities, studies incorporating DER impacts to the BPS, operational impacts of DERs to the BPS, and regulatory considerations related to DERs. Further, the RSTC will focus on approaches for evaluating the potential impacts and benefits of energy storage, hybrid resources, aggregated DERs, and other emerging technologies. Over the next two years, the RSTC will be focused on determining the risk mitigations for some risks, while developing and deploying risk mitigations for others.

RISK FRAMEWORK ACTIONS				
Identified Specific Risks	Technical Areas of Focus	Primary Subgroups	Risk Mitigation Determination	Develop and Deploy Risk Mitigation
Insufficient modeling, data, and/or study requirements to ensure adequate planning, protection, and operation of the BPS	<ul style="list-style-type: none"> data collection modeling tools model verification modeling usage 	SPIDERWG EAS	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> SAR for Reliability Standard <ul style="list-style-type: none"> MOD-031/MOD-032 PRC-006

RISK FRAMEWORK ACTIONS				
Identified Specific Risks	Technical Areas of Focus	Primary Subgroups	Risk Mitigation Determination	Develop and Deploy Risk Mitigation
Insufficient evaluation of the potential impacts of IBR by planning authorities	<ul style="list-style-type: none"> • Planning Studies • Design Criteria • Operations Planning 	<p>SPIDERWG</p> <p>EAS</p>	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Reliability Guideline <ul style="list-style-type: none"> ▪ Planning Studies (2023) ▪ Balancing (2024) • SAR for Reliability Standard <ul style="list-style-type: none"> ▪ FAC-001/FAC-002
Insufficient BPS situational awareness to determine operating state, reserve and other operational requirements, and maintain operational control.	<ul style="list-style-type: none"> • T-D Interface • Aggregators • Protection Systems • Decentral Operation • Security 	<p>SPIDERWG</p> <p>EAS</p>	<ul style="list-style-type: none"> • Whitepaper on DER Aggregator (2023) • Whitepaper on DER Security Vulnerabilities (2023) • Whitepaper on Communication and Coordination (2023) 	<ul style="list-style-type: none"> • SAR for Reliability Standard <ul style="list-style-type: none"> ▪ EOP-005 ▪ BAL-003 ▪ TOP-001/002 ▪ TOP-003 ▪ TOP-010

4. Supply Chain Security

Exploitation of cyber security risks could arise from a variety of external and/or internal sources. Additionally, the operational and technological environment of the electrical grid is evolving significantly and rapidly and increasing the potential cyberattack surface. Sources of potential exploitation include increasingly sophisticated attacks by nation-state, terrorist, and criminal organizations. Vulnerability to such exploits is exacerbated by insider threats, poor cyber hygiene, supply-chain considerations, and dramatic transformation of the grid’s operational and technological environment. Supply chains, specifically, are a targeted opportunity for nation-state, terrorists, and criminals to penetrate organizations without regard to whether the purchase is for information technology, operational technology, software, firmware, hardware, equipment, components, and/or services.

Supply chain risk management and the threats from components and sub-components developed by potential foreign adversaries should continue to be addressed by NERC and industry with evaluation of CIP-013 standard for any needed improvements. Over the next two years, the RSTC will be focused on determining the risk mitigations.

RISK FRAMEWORK ACTIONS				
Identified Specific Risks	Technical Areas of Focus	Primary Subgroups	Risk Mitigation Determination	Develop and Deploy Risk Mitigation
Inadequate supply chain security can disrupt, infiltrate, and expose OT systems to unauthorized control.	<ul style="list-style-type: none"> • Open Source Software • Provenance • Risk Management Lifecycle • Secure Equipment Delivery • Vendor Risk Management • Cloud Computing • Vendor Incident Response • Supply Chain Procurement 	SCWG	<ul style="list-style-type: none"> • Whitepaper: NERC Standards Gap Assessment 	<ul style="list-style-type: none"> • SAR for Reliability Standard <ul style="list-style-type: none"> ▪ CIP-013

Chapter 4: Primary Subgroup Strategic Direction

In the table below, the RSTC’s primary subgroups (those directly under the RSTC) each play a role in meeting the objectives and priorities of the RSTC. To provide additional clarity and direction, strategic direction that aligns with the RSTC’s strategic priorities, in addition to what is identified in the scope of the subgroup, is provided below:

Subgroup	Risk Framework Focus	Related Strategic Risk Priorities	Additional or Focused Key Actions to Support Strategic Risk Priorities
Event Analysis Subcommittee (EAS)	Identification Monitoring	<ul style="list-style-type: none"> • Energy Assurance • Inverter-Based Resources • Distributed Energy Resources 	<ul style="list-style-type: none"> • Identification of event trends related to inverter-based resources, DERs, and other “faint signals” that may be emerging from continuing system transformation.
Performance Analysis Subcommittee (PAS)	Identification Monitoring	<ul style="list-style-type: none"> • Energy Assurance • Inverter-Based Resources • Distributed Energy Resources 	<ul style="list-style-type: none"> • Identification of trends related to inverter-based resources, DERs, and other “faint signals” that may be emerging from continuing system transformation.
Real Time Operating Subcommittee (RTOS)	Identification Monitoring	<ul style="list-style-type: none"> • Energy Assurance • Inverter-Based Resources • Distributed Energy Resources 	<ul style="list-style-type: none"> • Provide a forum for coordinating system operating procedures in all four Interconnections, including: <ul style="list-style-type: none"> • Coordinate operating Reliability Standard implementation to promote consistency across the Interconnections. • Prepare for the upcoming operating peak demand season. • Review significant system disturbances and abnormal transaction curtailments, or others as requested by RTOS, for "lessons learned". • Review Interconnection frequency events at each meeting. • Provide feedback and guidance on matters relating to real-time challenges that DER activity presents grid operators
Synchronized Measurement Working Group (SMWG)	Monitoring	<ul style="list-style-type: none"> • Inverter-Based Resources • Distributed Energy Resources 	<ul style="list-style-type: none"> • Support any data collection or analysis of power system performance following selected events and significant disturbances. Coordinate with other NERC groups such as the Event Analysis Subcommittee and the System Analysis and Modeling Subcommittee, as applicable.

Subgroup	Risk Framework Focus	Related Strategic Risk Priorities	Additional or Focused Key Actions to Support Strategic Risk Priorities
Resources Subcommittee (RS)	Identification Monitoring	<ul style="list-style-type: none"> Inverter-Based Resources 	<ul style="list-style-type: none"> Providing industry leadership and guidance on matters relating to balancing resources and demand issues as well as resulting issues related to interconnection frequency.
Energy Reliability Assessment Task Force (ERATF)	Determining Deploying Measuring	<ul style="list-style-type: none"> Energy Assurance Inverter-Based Resources Distributed Energy Resources 	<ul style="list-style-type: none"> Coordinate developments of energy reliability assessment activities with industry working groups and other RSTC working groups Engage industry research and development organizations to validate the technical foundation(s) and development of the tool(s), metrics, and methods Coordinate studies and plans with adjacent Balancing Authorities to identify enhanced collaborative regional support Support standard drafting team
Reliability Assessment Subcommittee (RAS)	Identification Monitoring	<ul style="list-style-type: none"> Energy Assurance Inverter-Based Resources Distributed Energy Resources 	<ul style="list-style-type: none"> Support the annual review of each Assessment Area’s long-term and short-term resource adequacy plans. This includes: <ul style="list-style-type: none"> Identifying and monitor the key issues, risks, and uncertainties that may impact or have the potential to impact BPS reliability; Coordinating timely submittals of Assessment Area narratives and responses to questions developed by NERC with support from the RAS.
Security Integration and Technology Enablement Subcommittee (SITES)	Determining Deploying Measuring	<ul style="list-style-type: none"> Inverter-Based Resources Distributed Energy Resources Supply Chain Security 	<ul style="list-style-type: none"> Provide guidance to industry with recommendations for cyber and physical security practices, emerging technology solutions (e.g., cloud computing, virtualization), and approaches to appropriately secure operational technology systems
6 GHz Task Force (6GTF)	Determining Deploying Measuring	<ul style="list-style-type: none"> Energy Assurance 	<ul style="list-style-type: none"> Information that can be used for a range of audiences that describe potential emerging risks and possible solutions to address these risks.
Electric-Gas Working Group (EGWG)	Determining Deploying	<ul style="list-style-type: none"> Energy Assurance 	<ul style="list-style-type: none"> Author guidelines, white papers, compliance guidance, etc. in support of

Subgroup	Risk Framework Focus	Related Strategic Risk Priorities	Additional or Focused Key Actions to Support Strategic Risk Priorities
	Measuring		natural gas disruption considerations and risks that are applicable to all regions and could extend to be inclusive of all fuel sources.
EMP Working Group (EMPWG)	Determining Deploying Measuring	<ul style="list-style-type: none"> • Energy Assurance 	<ul style="list-style-type: none"> • The EMPWG will serve as a stakeholder forum for focusing on HEMP from a transmission planning and system analysis perspectives. Some of the primary focuses of EMPWG will be data collection, modeling practices that are to determine the BPS expectations for an EMP event.
Facility Ratings Task Force (FRTF)	Determining Deploying Measuring	<ul style="list-style-type: none"> • Energy Assurance 	<ul style="list-style-type: none"> • The RSTC, in its role serving as • the technical expertise and executing the collaborative role with RISC to prioritize efforts related to BES risk response, will delegate responsibility to the FRTF to carry out activities to: <ul style="list-style-type: none"> ▪ Provide information to industry on the issues, ▪ Support industry readiness and success on this topic
Inverter-Based Resource Performance Subcommittee (IRPS)	Determining Deploying Measuring	<ul style="list-style-type: none"> • Inverter-Based Resources 	<ul style="list-style-type: none"> • Develop and maintain Reliability Guidelines and/or SAR(s) to address: <ul style="list-style-type: none"> ▪ Frequency and voltage ride-through characteristics of inverter-based resources. ▪ Review and document recommended delays for the lowest levels of frequency to ensure transient/distorted waveform “ride through”. ▪ Explore the development of a performance-based NERC Reliability Standard that clearly addresses the control of inverter-based resources, not to be confused with the protective relay functions as specified in PRC-024-2. ▪ More clearly understand the potential limitations in early generation inverter technology to

Subgroup	Risk Framework Focus	Related Strategic Risk Priorities	Additional or Focused Key Actions to Support Strategic Risk Priorities
			<p>meet the proposed performance characteristics that support BPS reliability. Identify the extent to which these inverters may be modified to support BPS reliability, and articulate the limitations that may exist with today’s inverter-based resource (particularly solar PV) fleet.</p> <ul style="list-style-type: none"> ▪ Study the impacts that inverter momentary cessation (momentarily cease active power output) for voltage excursions could have on BPS reliability. Recommend performance characteristics related to momentary cessation, including the expected voltage levels and restore output characteristics.
<p>Load Modeling Working Group (LMWG)</p>	<p>Determining Deploying Measuring</p>	<ul style="list-style-type: none"> • Energy Assurance 	<ul style="list-style-type: none"> • Formulate and guide the NERC vision and activities to promote the advancement and utilization of dynamic load models and modeling practices. • Establish guidelines and technical reference documents related to dynamic load modeling practices, including explanations of existing dynamic load models and their structure, data sets, and parameter derivation.
<p>Security Working Group (SWG)</p>	<p>Determining Deploying Measuring</p>	<ul style="list-style-type: none"> • Supply Chain Security 	<ul style="list-style-type: none"> • Provide timely technical reports to RSTC on CMEP matters related to cyber and physical security • Develop materials from organized industry activities (such as tabletop exercises) led by or in collaboration with the SWG • Review lessons learned published by NERC where the RSTC seeks additional industry feedback to help determine whether additional guidance to industry is necessary

Subgroup	Risk Framework Focus	Related Strategic Risk Priorities	Additional or Focused Key Actions to Support Strategic Risk Priorities
Supply Chain Working Group (SCWG)	Determining Deploying Measuring	<ul style="list-style-type: none"> • Supply Chain Security 	<ul style="list-style-type: none"> • Development of Security Guidelines and metrics to provide guidance on Supply Chain issues or concerns.
System Planning Impacts from Distributed Energy Resources Working Group (SPIDERWG)	Determining Deploying Measuring	<ul style="list-style-type: none"> • Inverter-Based Resources • Distributed Energy Resources 	<ul style="list-style-type: none"> • NERC SPIDERWG will serve as a stakeholder forum for focusing on DER from a transmission planning and system analysis perspectives with primary focuses on DER data collection, modeling practices, model improvements, and steady-state and dynamic simulation assessments.
System Protection and Control Working Group (SPCWG)	Determining Deploying Measuring	<ul style="list-style-type: none"> • Inverter-Based Resources • Distributed Energy Resources 	<ul style="list-style-type: none"> • Provide subject matter expertise for NERC Reliability Standards and technical guidelines, including, but not limited to, the following: <ul style="list-style-type: none"> ▪ Protection and control systems, including local and wide area applications, and synchrophasor applications. ▪ Remedial Action Schemes (RAS). ▪ Power system monitoring

Chapter 5: Risk Mitigation Assessment Template

The RSTC uses this template to for subgroups to evaluate risks and determine appropriate risk mitigation/remediation solutions:

Priority	(From RSTC Risk Priorities)
Identified Specific Risk	(From RSTC Strategic Plan – Identified Specific Risks)
Description of Risk	(Description from subgroup)
Technical Background Materials	(Links to whitepapers, technical papers, other RSTC or ERO published material)
Relative Priority	(High, Med, Low – Based on the Subgroup’s Assessment)
Recommended mitigation steps	<p>(Proposed mitigation plan including, but not limited to, the following actions:</p> <ul style="list-style-type: none"> • Reliability Standards – SAR • Reliability/Security Guidelines • Compliance Guidance • Reliability Assessments • Stakeholder Outreach • Technical Reference Document • NERC Alert) <p>Identify the new RSTC Work Plan actions. Approval of this plan, per the RSTC Notional Work Plan Process, appends the RSTC work plan to include action items with specific deliverables.)</p>