NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Reliability and Security Technical Committee

2024-2025 Strategic Plan

January 2024

RELIABILITY | RESILIENCE | SECURITY




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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 Entities as shown on the map and in the 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	Reliability First
SERC	SERC Reliability Corporation
Texas RE	Texas Reliability Entity
WECC	WECC

Introduction and Objectives

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.
- Leverage industry technical expertise to provide insights, considerations and educational materials regarding reliability impacts of policy and regulatory decisions.
- Coordinate the objectives in the strategic work plan with the Standing Committees Coordinating Group.
- Support response to mandates related to BPS reliability (e.g. FERC Order 901[1], ITCS[2]).

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 retains the flexibility to address emerging issues.

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.

[1] https://www.ferc.gov/media/e-1-rm22-12-000
[2] https://www.nerc.com/pa/RAPA/Pages/ITCS.aspx

Executive Summary

Shortly after the Board approved the 2023 ERO Reliability Risk Priorities Report ("2023 ERO Risk Report") the RSTC convened a small group to conduct the two-year Strategic Planning Process, which is detailed in Appendix A. The group identified four strategic priorities, with the recognition of the need to increase awareness of reliability implications, and closer collaboration and coordination with policy makers on emerging energy policy issues:

1. Grid Transformation,
2. Inverter Based Resources (IBR),
3. Resilience and Extreme Events, and
4. Security.

Trends in several areas of the electric industry are the primary drivers of these priorities. Policy and economic drivers are shifting the resource mix from large, centralized fossil-fired power stations towards variable energy resources (VER) spread over large geographic areas. Concurrent with this shift, the capacity to provide essential reliability attributes that are inherent in large synchronous generators and critical to managing the reliability of the BPS are decreasing. The inverter-based devices that are expected to mimic and replace these Essential Reliability Services are still being evaluated for their applicability and functionality. Amid this transition, natural gas use for electric generation appears to increase in peak periods but for fewer hours. This is testing both the physical and regulatory interfaces between the electric and gas industries in novel ways. In addition, electric demand is growing in extraordinary ways and with uncertain load profiles. Compounding the risks, the impact of extreme weather events during this transition is challenging system operators in unprecedented ways. Finally, security risks appear to be increasing, and all industry stakeholders must remain vigilant to physical and cyber-attacks and disruption of globally interconnected supply chains.

With respect to the four emerging strategic risks, the RSTC identified specific focus areas and desired outcomes. Potential risk mitigation steps are left for further investigation by the subcommittees, working groups, and task forces (collectively "subgroups"). A complete list of the focus areas follows:

Grid Transformation

1. Energy Assurance: As the grid relies on more just-in-time fueled resources – i.e., natural-gas fired generators and VERs – and traditional, slower starting resources have become less economic to operate, ensuring energy is available and delivered at the right time to serve load is essential.
2. Gas-Electric Coordination: The gas infrastructure and regulatory framework were not originally designed to support the needs of the electric industry. As the generation fleet transitions to less carbon-intense resources, the use of gas fired resources for base load and peaking needs is increasing during critical times and under certain conditions, and the limitations of this historical framework are becoming more apparent.
3. Demand Growth: Electrification policies are adding to traditional macroeconomic-driven load growth. Moreover, the characteristics of newly connected loads are not well understood and may present unique reliability challenges. These demands compound the challenges of an evolving generation mix and manifestly increase reliability risk.
4. Distributed Energy Resources (DER): As the grid shifts toward more decentralized, distribution-connected generation, the reliability attributes also shift to where the generation is connected. This step towards major decentralization could be accompanied with unintended risks. Current Reliability Standard requirements are centrally focused to require performance on the generation side to serve load. There are no existing requirements that distribution-connected resources perform to maintain the reliability of the bulk power system.

5. Demand and DER Aggregators: For many years, utilities have implemented demand side programs to manage demand on their systems in an aggregated manner. Policy decisions, such as FERC Order 2222 along with technology advances, have also increasingly opened the door to market participation by aggregators of distribution-connected resources and for "third party" aggregators to manage and control their operation. The current and forecasted state of aggregation needs to be fully assessed to ensure we appropriately prioritize and coordinate efforts regarding aggregators of distribution-connected resources and performance, modeling, and visibility of these resources.

Inverter-Based Resources

1. IBR Performance: As the first generations of IBRs were deployed and reached a critical mass, issues with their ability to ride through system faults and disturbances became apparent. This has resulted in concerns for grid operators, and there are efforts underway to address the performance of in-service IBRs.
2. IBR Modeling versus Performance: In addition to the aforementioned operating concerns the nascent industry has lacked standard models used for power flow and grid stability analysis. Additionally, interconnecting utilities have found many device settings of installed IBRs deviate from the models provided.
3. IBR Interconnection Requirements and Evaluation: IBR numbers are expected to grow over the next decade and exceed the megawatts of synchronous generation in many regions. RSTC and its subgroups are examining the viability of codifying interconnection requirements to address the concerns with ride-through and actual versus modelled performance, plus potentially adding certain reliability services, on a prospective basis.

Resilience and Extreme Events

1. Planning for High-Impact Events: Generation performance is correlated with weather, and demand may exhibit nonlinear behaviors under extreme conditions. This necessitates an assessment of risk in planning models including low frequency but highly impactful conditions.
2. Wide-area Energy Assessments: Short- and long-duration low-frequency, high-impact weather events sometimes extend beyond the boundaries of individual balancing authority areas and can lead to an increase in propagating risks across a wide area. Resource planning and reliability assessments would benefit from joint-regional coordinated action.

Security

1. Physical and Cyber Security: External threats have caused damage and disruption to the Bulk Electric System (BES). Unfortunately, threats from lone wolf actors to state-sponsored hackers are expected to increase. DERs and Distribution-Side Aggregators are expanding the current attack surface. Raising awareness of these threat vectors and the extent to which DER aggregators may be following cybersecurity protocols encourages protective actions that mitigate the risk and strengthen the grid.
2. Supply Chain Assurance and Protection: Today's supply chain is highly globalized to the extent the BPS may not be able to function if supply of certain components is disrupted or weaponized. The risks from globalization are coming into sharp focus with recent geopolitical events. Attention is required to ensure the grid continues to function in the event global supply chains are disrupted.

While the small group debated and identified the strategic risks, it became apparent that the RSTC should undertake a thorough examination of the indicators and metrics used to measure risk. The consensus among the group is that existing metrics sufficiently measure the current state of reliability and may be used to extrapolate trajectories with historical data, but these indicators do not sufficiently measure emerging, novel risks. In early 2024 the RSTC will discuss action to:

- Review current reliability metrics,

- Identify the risks that those metrics are attempting to address,
- Identify risks areas that could materialize in the future and are unique or peculiar to the strategic risks,
- Define leading indicators that may better forecast future risk areas and allow the ERO and stakeholders to proactively mitigate those risks, and
- Identify appropriate pathways to communicate risks and new leading indicators to energy policymakers.

Following Board approval, the RSTC will communicate these strategic risks and focus areas to the subgroup leads. Through an iterative process, these groups will propose to the RSTC specific work plan items intended to mitigate these identified risks. The RSTC will review the work plan items against this strategic plan for alignment and prioritization and approve the work plan items as appropriate. The rest of this document describes the details of the processes used to develop the strategic plan and describes those risks in more detail.

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 who 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 the ERO's strategic plan.
- Maintain a focus on identification, analyses, and mitigation of existing and emerging reliability, resilience, and security risks.
- 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.
- 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 subcommittees, working groups and task forces are focused on the highest priorities for reliability, resilience, and security within the ERO enterprise.

Chapter 2: 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 strategic priorities and the expected work products may change, as needed. The strategic objectives of the RSTC are:

1. Drive effective mitigation actions against emerging and established reliability and security risks, specifically targeting the strategic 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.
6. Provide general information to a wide audience that highlights reliability and security risks on the bulk power system from significant changes to energy resources and electric loads.

To achieve these objectives, the RSTC uses its subgroups to develop its work products. The subgroups are organized under three categories: Performance Monitoring, Risk Mitigation, and Reliability and Security Assessment.

There are two types of key projects included in the RSTC work plan to support the 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. **Prioritized Risk:** Targeted and focused actions to identify and develop specific reliability risk mitigations. The RSTC's **Risk Mitigation** subgroups primarily serve to support the strategic risk 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 risks, the RSTC is able to craft risk-informed recommendations, provide the basis for actionable risk mitigations, and provide education to industry stakeholders and policymakers. The RSTC supports this process primarily through the Reliability Assessment Subcommittee (RAS), Performance Analysis Subcommittee (PAS), and Resources Subcommittee (RS). Primary deliverables include:

   a. **Long-Term Reliability Assessment (annually):** 10-year outlook of resource adequacy and transmission projections. Emerging reliability and security integration issues are identified.

   b. **Seasonal Reliability Assessments (annually):** Summer and winter season operational outlook, projection, and leading indicators.

   c. **Special Reliability Assessments (ad-hoc):** topical technical evaluation of a specified reliability risk.

d. **State of Reliability Report (annually):** Historical performance, evaluating 5-year (or longer) trends, indicators, and lagging metrics.

e. **Frequency Response Annual Analysis (annually):** Historical performance of frequency response per a Federal Energy Regulatory Commission (FERC) 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:

   a. **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.

   b. **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 policymaking 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 NATF, NAGF, IEEE, EPRI etc. as well as regulatory and governmental authorities to target specific technical areas of concern and work together on industry outreach. Primary engagements include:

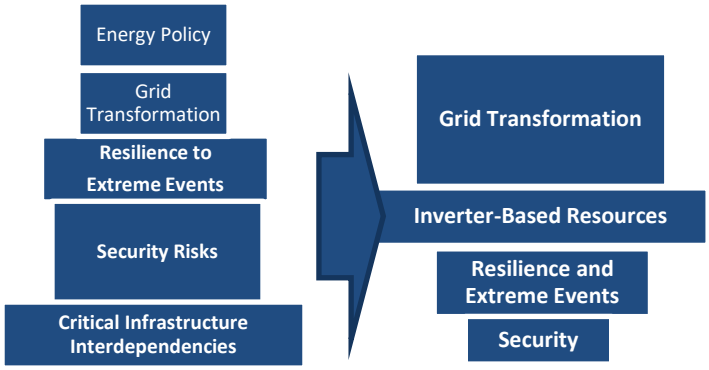
   a. **Reliability Conferences and Workshops (*ad-hoc*):** Convene industry to share and exchange ideas and practices that promote reliability in a variety of technical areas. Conferences can support the RSTC's mission by "creating a forum for aggregating ideas and interests, drawing from diverse industry stakeholder expertise, to support the ERO Enterprise's mission."

   b. **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 Profiles identified by the RISC, the RSTC has identified four strategic priorities: 1) Grid Transformation, 2) Inverter-Based Resources, 3) Resilience and Extreme Events, and 4) Security.

Risk Profiles (RISC Risk Priorities Report)	RSTC Strategic Risk Priorities



Future actions by the RSTC on its Strategic Risk Priorities are focused on the risk mitigation and deployment parts of the Framework for Risk Mitigation as explained in Appendix A. Through this strategic plan, subgroups are identified and tasked with identifying risk mitigation solutions (e.g., Reliability Standard, Reliability/Security Guideline) and working with the RSTC Executive Committee (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 that are not aligned with the prioritized risks, or refers matter(s) to the RSTC for further discussion. For each RSTC Strategic Risk Priority, a 2-Year plan is detailed below indicating specific risks, desired outcome and measures of success.

1. **Grid Transformation**

   Unassured fuel supplies, including the timing and inconsistent output from VERs, pipeline deliveries, and uncertainty 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 develop methods, processes, tools, and/or SARs that are needed to address energy security – factoring in modelling requirements, extreme events and critical infrastructure interdependencies.

   A part of the grid transformation creates a higher reliance on natural gas resources as a prime flexible resource to ensure reliable operation of the Grid. Coordination between the gas and electric systems will become even more important over the transition. Differences in scheduling requirements, physical capacity constraints, and adequate ramping capability must be addressed to ensure a reliable transition.

   Public policy and economics continue to drive the retirement of traditional resources at a time when load growth is beginning to quickly increase in portions of NERC. Technologies, such as electric vehicles, as well as new computing techniques, are driving substantial portions of this load growth. Some of the loads may have unique characteristics or interactions with other grid loads and resources that need to be fully understood to maintain reliability.

   In addition, across the industry there has been significant discussion regarding the impact of Distributed Energy Resources and aggregation of demand-side resources. The potential BES reliability impacts need to be assessed to ensure appropriate prioritization of industry resources around this topic.

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

Identified Specific Risks	Technical Areas of Focus	Desired Outcome	Measure of Success
Energy Assurance: Insufficient assessment of energy supplies to ensure operational awareness and energy availability.	• Modeling and data sharing requirements • System Operations • Resource planning	• SAR for Reliability Standards (submitted in 2022) • Supplemental materials developed and disseminated for industry use in performing energy assessments	• Standards Committee approval of new Reliability Standards • RSTC approval / endorsement of Considerations for Performing an Energy Reliability Assessment, Volume 2 • EEA3 trends • Performance during extreme weather conditions • CPS1 trends
Energy Assurance: Insufficient assessment of energy supplies to evaluate resource requirements in the long-term planning horizon.	• Modeling and data sharing requirements • Resource planning	• SAR for Reliability Standards (submitted in 2022) • Work on Long-Term Planning Horizon Standards expected to begin in 2024 • Supplemental materials developed & disseminated for industry use in performing energy assessments	• Standards Committee approval of new Reliability Standards (separate effort and SAR from Operations Planning Standards) • RSTC approval / endorsement of Considerations for Performing an Energy Reliability Assessment, Volume 2 • EEA3 trends • CPS1 trends
Gas-Electric Coordination: Increased dependence on natural gas as fuel for flexible and dispatchable resources	• Resource Planning • Modeling and data sharing requirements • System Operations	• Support WSE Joint Inquiry Report recommendations • Support DOE/NERC balancing study • Proactively identify regions and scenarios of elevated risk	• Reduce risk and actual occurrences of fuel-related generation outages due to lack of pipeline gas
Demand Growth: Accelerated demand growth	• Reliability Assessment • Resource Planning	• Methods to educate Policy Makers are effectively communicating reliability risks associated with the evolving resource mix • Methods / standards in place to ensure an adequate level of essential reliability services are	• SRA/WRA • LTRA • State of Reliability

Identified Specific Risks	Technical Areas of Focus	Desired Outcome	Measure of Success
		maintained throughout the transition	
Demand Growth: New loads may have unique characteristics which could present reliability concerns	• Load Modeling • System Operations • Transmission Planning	• Unique characteristics of new loads are identified & understood. • Viable solutions to address reliability concerns of new load characteristics are identified and documented.	• State of Reliability
Distributed Energy Resources: High penetration of DER may pose a reliability risk	• Identify specific reliability risks • Load forecasts • Ride-through	• Complete assessment of existing and expected penetration of Distributed Energy Resources and identification of associated reliability risks	• LTRA • Event Analysis
Demand and DER Aggregation: Increasing aggregation of demand side resources may pose reliability and security risks	• Identify specific aggregation operating modes	• Complete assessment of existing and expected activity of demand side aggregation of distribution-connected resources and identification of associated reliability risks • Evaluate cybersecurity, back-up control, essential reliability service, dispatchability, and reliable integration of DER aggregators. • Identify performance, modeling and data sharing requirements for planning and operating the BES	• LTRA • Event Analysis

2. Inverter-Based Resources

The bulk power system 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 IBRs 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.

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 drive improvements in the performance of IBRs by focusing on the improvement of IBR interconnection, planning studies, and operations, as well as staying abreast of new inverter technologies and risks. Communicating risk and mitigation measures across the industry will be a critical component of this strategy to enhance IBR performance.

Identified Specific Risks	Technical Areas of Focus	Desired Outcome	Measure of Success
IBR Performance	• System Operations • Event Analysis	• IBR ride-through of faults	• Event Analysis Process • State of Reliability Report • Summer and Winter Reliability Assessments • Long-Term Reliability Assessment
IBR Performance: Monitoring	• Event analysis	• Identify and study Events involving IBR performance	• Event Analysis Process • State of Reliability Report • Summer and Winter Reliability Assessments • Long-Term Reliability Assessment
IBR Modelling versus Performance	• Modeling and Data Sharing • Long-term planning studies • Event Analysis	• IBRs perform as modeled, or actual IBR performance is modeled in planning.	• Event Analysis Process • State of Reliability Report • Summer and Winter Reliability Assessments • Long-Term Reliability Assessment
IBR Interconnection Requirement and Evaluation	• Modeling and Data Sharing	• Impact of IBR Interconnection is fully understood and modelled before operating	• Event Analysis Process • State of Reliability Report • Summer and Winter Reliability Assessments • Long-Term Reliability Assessment

3. Resilience and Extreme Events

Recent cold weather events (e.g. Polar Vortices, Winter Storms Elliot, and Uri), heat events (e.g. 2020 California event and British Columbia's heat dome), and localized natural events (e.g. hurricanes, derechos

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

and ice storms) represent an increase in extreme natural events that have an impact on the resilience and reliability of the BPS. The RSTC and its subgroups will ensure modeling requirements include new approaches to adequately assess risks from low-frequency, high-impact events, including wide-area impacts to enable reliable operations of the BPS, and improve resource and energy planning.

The RSTC will develop methods, processes, tools, and/or SARs that are needed to address system resiliency and reliability during extreme events.

Identified Specific Risks	Technical Areas of Focus	Desired Outcome	Measure of Success
Planning for High-Impact Events: Assess expected performance of the bulk power system during extreme events	• Load Forecasting • Probabilistic Assessment • Energy Assessment • Model Verification • Transmission Planning	• Develop new approaches in ERO reliability assessments to adequately assess impacts of extreme events. • Leverage existing GridEx events to assess readiness from a confluence of extreme weather and cyber events.	• Event Analysis Process • State of Reliability Report • Summer and Winter Reliability Assessments • Long-Term Reliability Assessment • Special Assessment
Wide-Area Energy Assessment: Assess expected performance of the bulk power system during extreme events involving neighboring regions	• Energy Assessment • Probabilistic Assessment • Model Verification • Transmission Planning	• Enhancement to Reliability Assessment Process to include Wide-Area Energy Assessment Capabilities • Develop new approaches in ERO reliability assessments to adequately assess wide-area energy risks. • Conduct special assessments of wide-area extreme event impacts. • Sponsor joint regional reliability assessments that could occur from extreme weather events.	• Summer and Winter Reliability Assessments • Long-Term Reliability Assessment • Special Assessment

4. Security

Exploitation of 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.

Identified Specific Risks	Technical Areas of Focus	Desired Outcome	Measure of Success
Physical & Cyber Security:	• Distributed Energy Resources • Demand Side Aggregators • Integration of new technology	• Improved awareness of and resistance to potential attacks	▪ State of Reliability ▪ Event Analysis
Supply Chain Assurance & Protection: Inadequate supply chain security can disrupt, infiltrate, and expose OT systems to unauthorized control.	• Open-Source Software • Provenance • Risk Management Lifecycle • Secure Equipment Delivery • Vendor Risk Management • Cloud Computing • Vendor Incident Response • Supply Chain Procurement	• Whitepaper: NERC Standards Gap Assessment • Coordinate with NATF and NAGF for supply chain evaluation activities	▪ SAR for Supply Chain Standards ▪ Evaluation of the security of the global supply chain and identification of critical components with limited availability

Chapter 3: 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	Focus	Related Strategic Prioritized Risk
Event Analysis Subcommittee (EAS)	Identification Monitoring	• Grid Transformation • Inverter-Based Resources • Resilience and Extreme Events
Performance Analysis Subcommittee (PAS)	Identification Monitoring	• Grid Transformation • Inverter-Based Resources • Resilience and Extreme Events
Real Time Operating Subcommittee (RTOS)	Identification Monitoring	• Grid Transformation • Inverter-Based Resources • Resilience and Extreme Events
Synchronized Measurement Working Group (SMWG)	Monitoring	• Grid Transformation • Inverter-Based Resources
Resources Subcommittee (RS)	Identification Monitoring	• Grid Transformation • Inverter-Based Resources
Energy Reliability Assessment Working Group (ERAWG)	Determining Deploying Measuring	• Grid Transformation • Inverter-Based Resources • Resilience and Extreme Events
Reliability Assessment Subcommittee (RAS)	Identification Monitoring	• Grid Transformation • Inverter-Based Resources • Resilience and Extreme Events
Security Integration and Technology Enablement Subcommittee (SITES)	Determining Deploying Measuring	• Grid Transformation • Security
6 GHz Task Force (6GTF)	Determining Deploying Measuring	• Grid Transformation
Electric-Gas Working Group (EGWG)	Determining Deploying Measuring	• Grid Transformation • Resilience and Extreme Events

Subgroup	Focus	Related Strategic Prioritized Risk
Facility Ratings Task Force (FRTF)	Determining Deploying Measuring	• Resilience and Extreme Events
Inverter-Based Resource Performance Subcommittee (IRPS)	Determining Deploying Measuring	• Inverter-Based Resources
Load Modeling Working Group (LMWG)	Determining Deploying Measuring	• Grid Transformation
Security Working Group (SWG)	Determining Deploying Measuring	• Security
Supply Chain Working Group (SCWG)	Determining Deploying Measuring	• Security
System Planning Impacts from Distributed Energy Resources Working Group (SPIDERWG)	Determining Deploying Measuring	• Grid Transformation • DER
System Protection and Control Working Group (SPCWG)	Determining Deploying Measuring	• Inverter-Based Resources

Appendix A: 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 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.

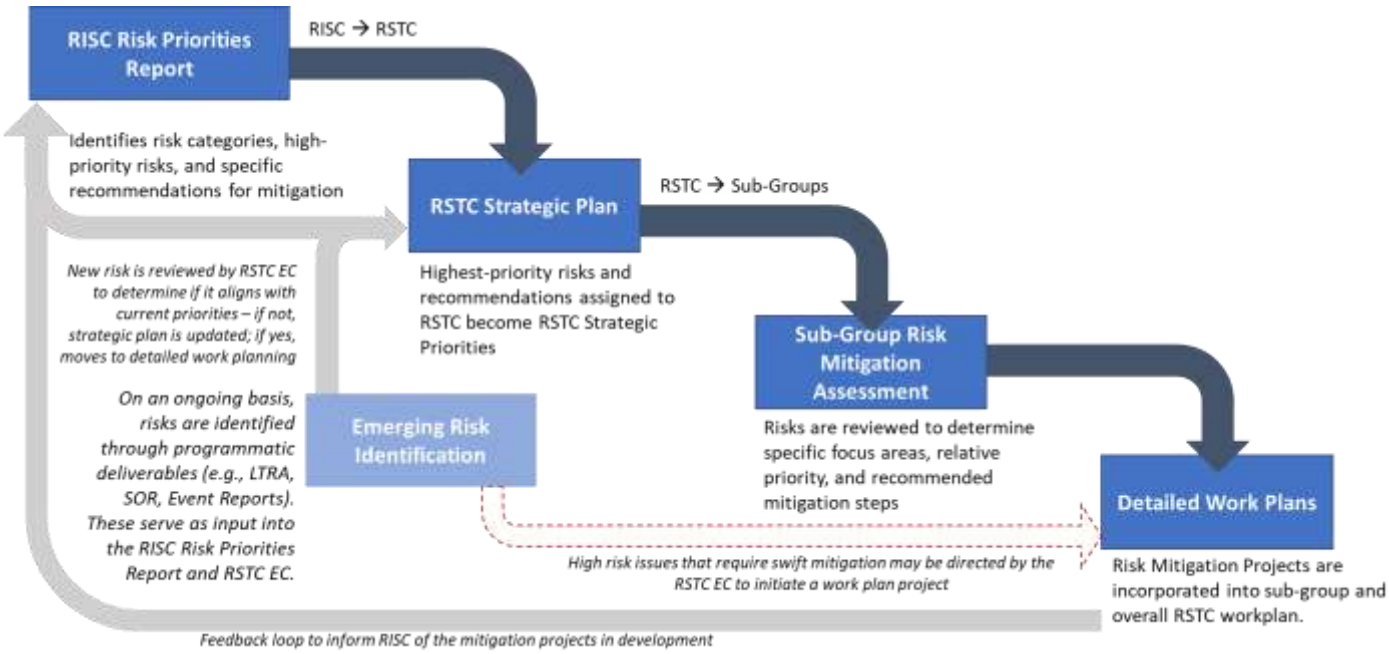


Figure 1: RSTC Strategic Planning Process Flow Chart

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 Framework[5] 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 Process[6] 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:

[5] https://www.nerc.com/comm/RISC/Related%20Files%20DL/Framework-Address%20Known-Emerging%20Reliabilit-Securit%20%20Risks_ERRATTA_V1.pdf
[6] 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	• Identification and Monitoring ▪ 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	• RSTC Biennial Strategic Plan
4. Deploying Risk Remediation/Mitigation	RSTC develops and deploys remediation/mitigation	• RSTC Work Plan ▪ 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.	• Identification and Monitoring ▪ 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.	• Identification and Monitoring ▪ Long-Term, Seasonal, and Special Reliability and Security Assessments ▪ Event and Disturbance Reports ▪ State of Reliability Report ▪ 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.