NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

NERC Energy Reliability Assessment Task Force (ERATF)

2020–2022 Work Plan

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RELIABILITY | RESILIENCE | SECURITY




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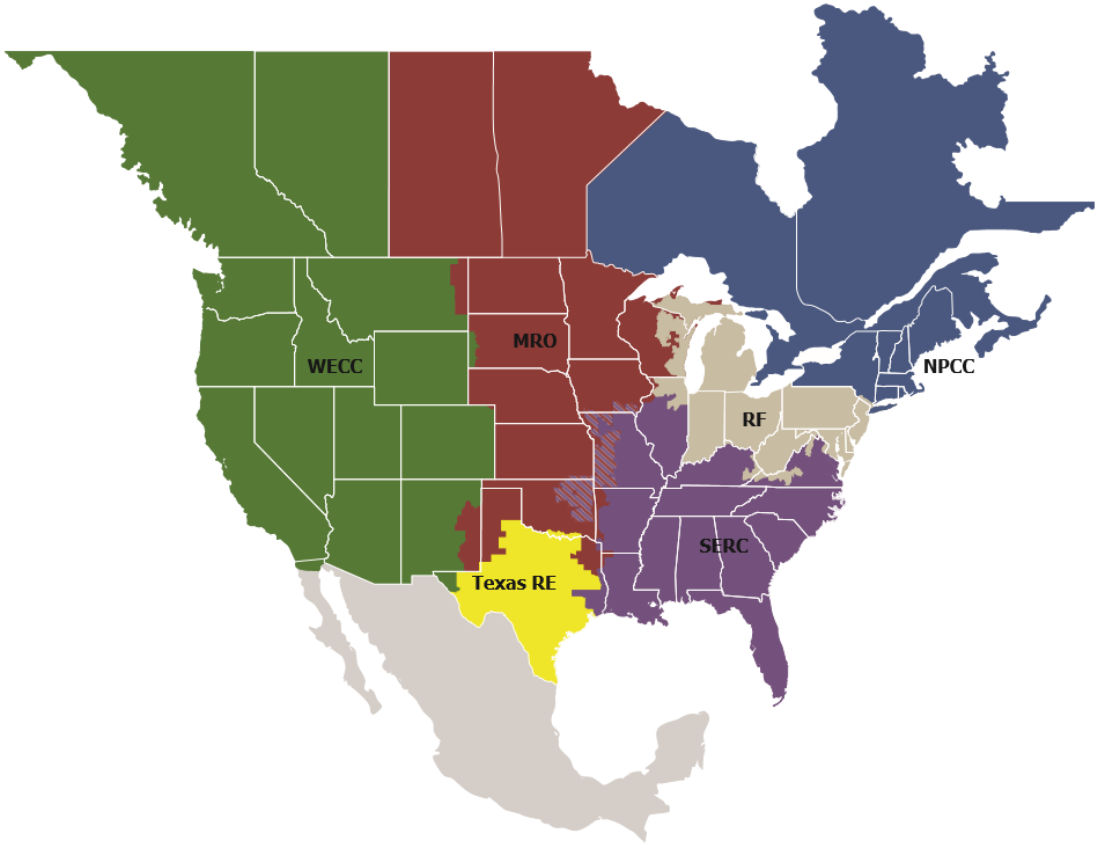
Preface

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 (REs), 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 RE boundaries as shown in the map and corresponding table below. The multicolored area denotes overlap as some load-serving entities participate in one RE while associated Transmission Owners (TOs)/Operators (TOPs) 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

Task Description/Deliverables

Table 1.1: Task Description / Deliverables			
	Task Description/Deliverables	**Target Completion**	**Resource (s)**
1	Coordinate work activities with industry working groups	Ongoing	ERATF
2a	Assemble the subject matter experts for Focus Areas	Q1-2021	ERATF
2b	The subject matter experts complete the deliverables as outlined in **Table 1.2**	Q4-2021	Various working groups as assigned
2c	Engage industry research and development organizations to validate work from Focus Areas	Ongoing	TBD
3	Coordinate studies and plans with adjacent Balancing Authorities to identify enhanced collaborative regional support.	Ongoing	ERATF/RS

The Energy Reliability Assessment Task Force will coordinate energy assurance activities with industry working groups and will identify subject matter experts and assemble them to develop the work (stated in the deliverables).

Table 1.2: Focus Area Details					
Focus Area	**Task Description**	**Deliverables**	**Target Completion**	**Resource (s)**	**Status**
1	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, 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 the utilization of system resources affects the availability during peak hours in a limited energy situation. Generator flexibility is gaining importance as load ramps begin to stress the existing infrastructure.	• Develop the technical foundation for the three timeframes • Determine the ways to identify the levels of energy that are required to meet the operational needs • Develop tool specifications needed to incorporate energy considerations into planning, operational planning and operations assessments • Evaluate the NERC Standards for omissions to address fuel assurance and resulting energy limitations for the planning timeframe	Q4-2021	TBD	New
2	Natural 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	• Develop the technical foundation for the three timeframes • Determine how fuel availability is incorporated as part of an analysis	Q4-2021	EGWG	New

Table 1.2: Focus Area Details					
Focus Area	**Task Description**	**Deliverables**	**Target Completion**	**Resource (s)**	**Status**
	likely be natural-gas-fired generation. • The variability of the renewable resources will likely change how natural 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 natural gas demand due to higher overall natural gas generation ramp rates and shorter periods of online time, burning 24 hours of natural gas in 8 hours instead of 16) Forces external to power system operators may influence natural gas delivery security, such as policies and procedure developments from FERC, NAESB, natural gas pipeline companies, or other entities	• Develop the specifications for models for natural gas pipeline disruption scenarios • Evaluate the NERC Standards for omissions to address fuel assurance and resulting energy limitations for the planning timeframe			
3	Metrics, Procedures and Analysis • Determine whether emergency procedures need to be revised to reflect the current fleet structure and operating needs. • Determine when and how demand response should be considered when assessing fuel availability and energy adequacy. • Determine if common practices are needed to calculate how Effective Load Carrying Capability or other useful metrics. • Determine if common planning practices are needed to incorporate forced outages into resource adequacy analysis. • Determine how the availability of the interconnection's import transfer capability factors into the resource adequacy analysis.	• Develop the technical foundation for the three timeframe • Develop the specifications for non-fuel dependent and variable energy resources • Develop metric specifications needed to incorporate energy considerations that are not dependent on fuel delivery into planning, operational planning and operations assessments • Evaluate the NERC Standards for omissions to address fuel assurance and resulting energy limitations for the planning timeframe	Q4-2021	TBD	New

Table 1.3: Resource Map			
11 Questions from the White Paper	**Mid to Long Term Planning [Greater than one year]**	**Operational Planning [1 day to one year]**	**Operations [0 to 1 day]**
1 – ensuring adequate flexibly	RAS/SPIDERWG/PAWG	RTOS/RS/RAS	RTOS/RS
2 – emergency procedure enhancements	RAS	RTOS/RS/RAS	RTOS/RS
3 – demand response considerations	RAS/PAWG	RTOS/RS/RAS	RTOS/RS
4 – storage energy evaluation	RAS/IRPWG	RTOS/RS/RAS/IRPWG	RTOS/RS/IRPWG
5 – ELCC and other probabilistic metrics	RAS/PAWG	RTOS/RS/RAS	RTOS/RS
6 – incorporating forced outages in planning	RAS/PAWG	RTOS/RS/RAS	RTOS/RS
7 – incorporating transfers in planning	RAS/PAWG	RTOS/RS/RAS	RTOS/RS
8 – tools to address energy adequacy	IRPWG/RAS/PAWG	RTOS/RS/RAS	IRPWG/RTOS/RS
9 – overbuild of capacity for resilience	IRPWG/RAS/PAWG	RTOS/RS/RAS	IRPWG/RS
10 – fuel contracts and availability	RAS/EGWG	RTOS/RS/RAS/EGWG	EGWG
11 – modeling pipeline disruptions	EGWG/PAWG	RTOS/RS/RAS/EGWG	RTOS/RS/EGWG

The focus areas from the eleven questions are as follows:

- Focus #1: 1, 4, 8, 9
- Focus #2: 10, 11
- Focus #3: 2, 3, 5, 6, 7

Understanding energy adequacy, and by extension, fuel availability compared to capacity requires advanced consideration of multiple technologies and concepts; see the following examples:

1. What flexibility is required to balance volatility in resource and load uncertainty through multiple operating horizons and seasons of the year?
2. Should emergency procedures be revised to reflect current fleet structure and operating needs?
3. When and how should demand response be considered when assessing fuel availability and energy adequacy?
4. How should the fuel availability/energy adequacy of battery or long-duration storage be evaluated?
5. Does there need to be common practices on how effective load carrying capability[1] or other useful metrics are determined?
6. Does there need to be common planning practices for how forced outages are incorporated into resource adequacy analysis?
7. How does the availability of the interconnection's import transfer capability factor into the resource adequacy analysis?
8. Are there new tools needed to address not only the traditional capacity adequacy but energy adequacy and meeting reliable operational requirements?

[1] Effective load carrying capability results in a derating factor that is applied to a facility's maximum output (Pmax) towards its expected capacity value.

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) could provide for a resilient and reliable transition?
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?
11. How should natural gas pipeline disruption scenarios be modeled, realizing that individual pipeline design and generators interconnections vary that result in different impacts to the generator and the BPS?

Acronym	Subcommittee, working group or task force
EGWG	Electric-Gas Working Group
IRPWG	Inverter-Based Resource Performance Working Group
PAWG	Probabilistic Assessment Working Group
RAS	Reliability Assessment Subcommittee
RS	Resources Subcommittee
RTOS	Real Time Operating Subcommittee
SPIDERWG	System Planning Impacts from Distributed Energy Resources Working Group