

# Energy Reliability Assessment Task Force

## Scope

February 2021

### Purpose

The North American Electric Reliability Corporation (NERC) Reliability and Security Technical Committee (RSTC) is a standing committee that strives to advance the reliability and security of the interconnected bulk power system (BPS) of North America by doing the following:

- Creating a forum for aggregating ideas and interests and drawing from diverse industry stakeholder expertise to support the Electric Reliability Organization (ERO) Enterprise's mission
- Leveraging industry expertise to identify solutions to study, mitigate, and/or manage emerging risks to the BPS for the benefit of industry stakeholders, the NERC Board of Trustees (Board), and ERO Enterprise staff and leadership.

Electricity is fundamental to the quality of life for nearly 400 million citizens of North America. Electrification continues as new applications are developed for use in advanced technologies; for example, advanced computing now permeates every aspect of our economy, and policy makers are seeking to electrify transportation and heating in order to decarbonize the economy. The BPS is undergoing unprecedented changes that require a rethinking of generating capacity, energy supply, and load serving needs.

Layered into this uncertainty, natural gas fueled resources may, depending on the contract for fuel acquisition,<sup>1</sup> be subject to fuel curtailment or interruption during peak fuel demands in some areas. Additionally, natural gas pipeline designs and how generators interconnect with these pipelines can vary, resulting in significantly different impacts on generators and the BPS under natural gas pipeline disruption scenarios. Furthermore, variable energy resources require that there are sufficient flexible energy resources available to quickly respond to off-set ramping requirements in some areas. To some extent, the impacts can be mitigated with the supply and geographical diversity from renewable and smaller distributed resources. However, these uncertainties are already causing many system operators to consider scheduling, optimization, and commitment of resources over a multi-day time frame. Replacing the existing generation fleet with energy-limited resources requires industry to consider capacity requirements, energy resources, and fuel availability by extension. Even if sufficient capacity is available, a level of certainty in the delivery of fuel is required to ensure that energy is available to support demand.

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<sup>1</sup> Contracts here should be considered in the broadest sense. Namely, beyond just firm/interruptible natural gas, there is the need for logistics of natural gas and fuel oil acquisition, transportation, and delivery in a timely fashion to address emerging and projected energy requirements.

The Energy Reliability Assessment Task Force (ERATF) will assess risks associated with unassured energy supplies<sup>2</sup> that include the timing and inconsistent output from variable renewable energy resources, fuel location, and volatility in forecasted load that can result in insufficient amounts of energy on the system to serve electrical demand as well as make recommendations to ensure the reliable operation of the BPS throughout the year.

## Roles and Activities

The *Ensuring Energy Adequacy with Energy-Constrained Resources*<sup>3</sup> whitepaper that was reviewed by the RSTC identified energy availability concerns related to operations, operations planning, and mid- to long-term planning timeframe. This has also been a source of discussion within the industry. Future considerations related to the reliability of energy are more complex and consider use of utility and non-utility assets in different manners as compared to a historical view. In order to effectively accommodate that type of conversation, the industry needs to assess the current processes and expectations to ensure the “basics” are covered. The RSTC will delegate responsibility to the ERATF to carry out the following activities in its role of obtaining stakeholder engagement and feedback:

- Provide information to industry on the issues
- Support industry readiness and success on this topic
- Foster, coordinate, and facilitate activities of industry and RSTC sub-groups around the issues, risk, and potential mitigations or course corrections
- Gather industry feedback around recommended solutions that are actionable by either registered entities or industry groups (membership forums, trade associations, and technical committees, etc.)
- Evaluate options for industry outreach
- Develop suggested recommendations related to the issues
- Present work outcomes to the RSTC for awareness
- Determine appropriate path for recommendations to be considered and action taken
- For the planning, operational planning, and operations time horizons, identify the parameters for tools and methods that can identify the right mix of resources to ensure sufficient amounts of energy are available for the following:
  - To serve demand
  - To meet ramping requirements at all times
  - To ensure the required energy can be delivered from the source to the end user

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<sup>2</sup> Some examples: lack of firm natural gas transportation, pipeline maintenance or disruption, compressor station failures, and/or emission limitations on fossil fuels. All resources have some degree of fuel uncertainty due to unavailability, including coal (onsite stock-piles can be frozen) and nuclear (during some tidal conditions affecting cooling intake).

<sup>3</sup> [https://www.nerc.com/comm/RSTC/AgendaHighlightsandMinutes/RSTC\\_Meeting\\_Agenda\\_Package\\_Sept\\_15\\_2020\\_ATTENDEE\\_PUBLIC.pdf](https://www.nerc.com/comm/RSTC/AgendaHighlightsandMinutes/RSTC_Meeting_Agenda_Package_Sept_15_2020_ATTENDEE_PUBLIC.pdf)

The ERATF will provide suggestions on issues for discussion and recommendations to NERC. Understanding energy availability, and by extension, fuel availability compared to capacity requires advanced consideration of multiple technologies and concepts. The ERATF will evaluate and recommend solutions for topics including, but not limited to, the following:

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<sup>4</sup> 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?
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?

The ERATF will report its work and deliverables to RSTC, and the RSTC maintains ultimate responsibility for decisions and recommendations to NERC.

Advancing the above concepts with industry requires discussions with appropriate NERC technical committees. In addition, the following actions should be initiated:

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<sup>4</sup> ELCC results in a derating factor that is applied to a facility's maximum output (Pmax) towards its expected capacity value.

- Coordinate developments of energy reliability assessment activities with industry working groups
- Subject matter experts should be assembled (e.g. task forces or working groups) to develop the following:
  - The technical foundation for energy assurance and assessment in each of the three time horizons
  - Ways to identify the levels of energy that are required to meet the operational needs
  - The tool specifications needed to incorporate energy considerations into planning, operational planning, and operations assessments
- Engage industry research and development organizations (e.g. Electric Power Research Institute, United States Department of Energy, Natural Resources Canada, and national laboratories, etc.) 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
- Evaluate the NERC standards for omissions to address fuel assurance and resulting energy limitations for the planning timeframe

## Membership

The ERATF membership will be comprised of those RSTC members appointed by the RSTC chair and observers:

- Composition
  - RSTC members
  - RSTC active participants and observers
- Leadership
  - The ERATF will have a chair appointed by the RSTC chair.
- Observers
  - The ERATF chair may invite observers to participate in meetings, which may include additional NERC or Regional Entity staff as well as other RSTC members. Observers may actively participate in the discussion and ERATF deliverables.

## Meetings

The ERATF meetings will be scheduled based on workload as determined by the members. Meetings may also occur in conjunction with the regular RSTC meetings. The ERATF meetings will be open to other participants. The ERATF chair will approve this participation and work with the RSTC chair for any necessary appointments.