

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Energy Reliability Assessment Task Force (ERATF)

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RELIABILITY | RESILIENCE | SECURITY



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

Capacity = Energy + Ancillary Service + Flexibility

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

Define
Adequate
Studies

Require
Adequate
Studies

Take action
for all time
horizons

Energy
Adequacy

- Understanding energy adequacy, and by extension, fuel availability compared to capacity requires advanced consideration of multiple technologies and concepts
- Eleven Questions asked in the whitepaper entitled “[Ensuring Energy Adequacy with Energy-Constrained Resources](#)”
 - Evaluated each of the eleven questions against three time frames
 - The questions are categorized into 3 focus areas
 - Focus 1 – Energy Adequacy and Flexibility for Evolving Resource Mix
 - Focus 2 – Gas Delivery Security
 - Focus 3 - Metrics, Procedures and Analysis

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

- Gas Delivery Security

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

- **Scope**: *Assess risks associated with unassured energy supplies that include:*
 - *The timing and inconsistent output from variable renewable energy resources*
 - *Fuel location*
 - *Volatility in forecasted load that can result in insufficient amounts of energy on the system to serve electrical demand*
 - *Make recommendations to ensure the reliable operation of the bulk power system throughout the year*
- **ERATF Roster**:



Questions and Answers