



MOVING TOWARD A MULTI-METRIC CRITERIA APPROACH TO RESOURCE ADEQUACY

Planning for Power System Reliability Needs to Consider the Size, Duration, Frequency, and Timing of Generation Shortfalls; Incorporate Tail Events; and Link Reliability and Economics

Reston, Va. – The Energy Systems Integration Group (ESIG) has released a new report, [*New Resource Adequacy Criteria for the Energy Transition: Modernizing Reliability Requirements*](#), outlining the need for, and a path toward, the use of a multi-metric criteria approach in resource adequacy analysis.

As our power system becomes cleaner and more weather-dependent, ensuring resource adequacy becomes more nuanced. It requires a new way of setting resource adequacy thresholds that is responsive to the rapid load growth, plant retirements, and a shift toward variable and energy-limited resources. Resource adequacy criteria serve to set the level of supply- and demand-side resources required for a power system to meet its reliability objectives. This standard influences billions of dollars of investment decisions.

The most common resource adequacy criterion today—the one-day-in-10-year loss-of-load expectation (or LOLE) in North America. However, this single metric only measures outage frequency and does not capture the size, duration, or timing of generation shortfalls. It also treats longer or widespread outages as equal to shorter, less severe outages. This failure to accurately reflect the real-world nature and impact of power outages, which vary enormously in their economic and human consequences, limits planners’ ability to accurately and efficiently plan a reliable system.

According to Derek Stenlik of Telos Energy and the report’s lead author, “continued reliance on using only the 1-day-in-10 planning criterion to make plant retirement and new resource investment decisions is short-sighted. Changing power system risks require us to reconsider how we determine whether we have enough—and the right type of—resources to ensure reliability.”

The report explores what it might look like to adopt a multi-metric criteria approach, a framework that would provide a more comprehensive assessment of the size, frequency, and duration of shortfalls; explicitly consider rare, high-impact events such as extreme weather; and stress-test extreme events that may fall outside historical records.

The report also discusses the need to establish the appropriate trade-off between reliability and cost. Different options for improving reliability come at different costs, and eliminating all risk in the system is not possible; therefore, as a society, we have to decide how much we will

pay for reliability. It is crucial for resource adequacy criteria to capture this intrinsic link between cost and reliability, and for it to be transparent and well understood by all involved.

James Okullo, director of system planning at ESIG, described how “this report establishes an important foundation for the industry to develop and adopt new, comprehensive, and adaptive resource adequacy criteria. As various regions start to contemplate these shifts, we hope this resource provides a uniform framework and guidelines for broad application to maintain both system reliability and economic efficiency.”

This report is the result of a multi-disciplinary task force and part of a DOE-funded research initiative.

ESIG is a nonprofit organization that marshals the expertise of the electricity industry’s technical community to support grid transformation and energy systems integration and operation. The report can be downloaded at <https://www.esig.energy/new-resource-adequacy-criteria/>.

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