



SERC Reliability Corporation
3701 Arco Corporate Drive, Suite 300
Charlotte, NC 28273
704.357.7372 | Fax 704.357.7914 | www.serc1.org

**Written Statement of
Brian F. Thumm, PE
Senior Director – Compliance and Reliability
SERC Reliability Corporation**

**Quadrennial Energy Review Task Force
May 24, 2016**

Thank you for the opportunity to participate on today's panel discussion regarding the future needs of the Bulk Electric System (BES). Although my remarks are informed by my extensive experience in the investor owned utility sector, both in generation and transmission roles, I am honored to provide the perspectives of SERC Reliability Corporation (SERC) and its role in ensuring a reliable BES as we navigate through the challenges of an evolving industry.

Introduction

Shortly after the blackout of 2003, former Energy Secretary Bill Richardson was quoted saying "We are a superpower with a third world electricity grid." In preparation for today's panel discussion, I read in the Stakeholder Briefing Memo that "The United States has one of the world's most reliable, affordable, and increasingly clean electric systems." While the former may be characterized as hyperbole, and the latter as hubris, it may be worthwhile to simply recognize that the BES in the United States continues to evolve to meet new challenges.

Our BES faces challenges in the near-term. A changing resource mix puts pressure on coordinated planning efforts. That changing resource mix is largely characterized by variable energy resources like wind and solar, which put pressure on essential reliability services like frequency response, voltage control, and generation ramp rates. The BES suffers from parallel flow issues, forecast shortcomings, and a multitude of other challenges that manifest in both the planning and the operating horizon.

But the BES continues to evolve in a way to address those challenges head-on. The role of a Regional Entity like SERC is to help ensure the grid remains reliable from the infrastructure development processes to real-time operations. SERC has a number of tools at its disposal, including reliability monitoring tools, compliance monitoring and enforcement tools, and collaboration and data sharing tools. In the end, SERC's goal is the same as the registered entities it interacts with: reliability excellence.

About SERC

SERC is a non-profit corporation headquartered in Charlotte, NC. SERC's mission is to promote and improve the reliability of the BES within its regional boundaries. The SERC Region covers part of or all of sixteen states in the southeastern United States, encompassing an area of approximately 560,000 square miles and more than 53 million customers. SERC is divided into five diverse Reliability Coordinator Areas, two of which operate a centrally dispatched wholesale energy market. SERC currently has 54 members and nearly 200 registered entities, which include investor-owned systems, municipal, cooperative, state and federal systems, Regional Transmission Organizations (RTOs), Independent System Operators (ISOs), independent power producers (IPPs), and power marketers.

As one of eight Regional Entities in North America, SERC has been delegated authority from the Electric Reliability Organization (ERO) to perform certain functions and is subject to oversight from the Federal Energy Regulatory Commission (FERC). SERC oversees the implementation of the compliance monitoring and enforcement program within its Region. SERC also maintains a robust Reliability Assessment and Performance Analysis program, which also includes components of situational awareness and event analysis. SERC's ongoing analysis and assessment of the BES assures dependable delivery of the energy needs throughout its footprint.

In addition to the compliance and reliability functions, SERC maintains a robust portfolio of technical committee forums, outreach programs, and analysis efforts to further enhance its mission to promote reliability. This includes outreach within the compliance function, various performance analysis initiatives, industry briefings, and risk analysis through data collection and trending.

SERC's Role in BES Infrastructure Planning and Operations

This panel seeks to inform the Department of Energy on the planning, building, and operating of BES assets. Of these three areas, SERC plays a role in two of them: Planning and Operating. SERC's role in Planning, a collaborative role amongst its members, is one in which it helps ensure the system is effectively studied, and the limitations are clearly identified. SERC's role in Operations is also collaborative. SERC facilitates an exchange of ideas through common training opportunities, such as its System Operator Conferences. SERC oversees compliance with the Reliability Standards that govern both Planning and Operating activities. Whether through collaboration or compliance enforcement, SERC enables its members to make the proper decisions within their own organizations.

Regional and Eastern Interconnection Planning Process

Through its stakeholder committees, SERC is the central coordinator for analysis and entity forums necessary to develop planning solutions and reliability assessments in the SERC Region. SERC is not a registered Planning Coordinator, but currently has over 30 Planning Coordinators and Transmission Planners (representing a mix of capacity and bilateral markets) who collaborate to provide this function in the SERC Region. For power system planning purposes, planners work with various stakeholders down to the state level and generation resource changes are evaluated for their collective impact on the power system. To put this in perspective, below are some of the changes SERC expects to see in its Region in the coming decade:

- An increase of 11,600 MW of gas-fired generation
- A decrease of 3,800 MW of coal-fired generation
- An increase of 6,000 MW of nuclear generation
- An increase of 1,700 MW of “other” generation, such as wind and solar

Since the power system is tightly integrated a Region-wide planning approach remains necessary to provide an adequate “reliability check.” Coordinated planning efforts help provide assurances that, while individual utilities are determining the “appropriate amount” of generation to add to the system and the correct fuel mix to ensure efficiency and compliance with emerging environmental regulations, SERC is able to add value by taking a big picture view at overall system reliability.

For example, consider the amount of effort dedicated to the implementation of the Clean Power Plan (CPP). The CPP contemplates a changing resources mix to meet very specific environmental restrictions. By and large, the resource fuel targets are contemplated with little regard to the deliverability of said resources. Transmission studies need to be performed to ensure adequate infrastructure exists to accommodate the resource changes. At an individual utility level, this is part of a robust planning process. At a Regional level, coordination of the individual utility plans becomes necessary to ensure the BES remains reliable and efficient. This is particularly important in a Region like SERC, characterized by bilateral energy markets, not a centrally dispatched energy market. Regardless of whether the CPP survives its legal challenges, the natural evolution of the power grid is toward one which will embrace environmental concerns. The CPP simply accelerates that transition to a modern grid.

SERC has a role in ensuring the transition is thoughtful and successful. SERC is conducting outreach to the southeastern states, assisting in answering questions regarding reliability impacts of the CPP in the context of all of the other power system

changes that are being evaluated. SERC supported the development of the *NERC CPP Reliability Considerations Report* and is continuing to support the development of the NERC Phase II study of the reliability impact of the CPP. SERC will perform a follow-up transmission study to round out the assessment performed by NERC. A collaborative forum will be held to discuss the results and preparations needed.

Changes to the power system are assessed and vetted through annual Planning Coordinator, Regional Entity, and Interregional Planning processes (such as the Eastern Reliability Assessment Group). SERC's role is to provide an independent assessment of the planned changes in resource mix and other reliability implications such as transmission system impacts.

The actual plan and related decisions rest with the asset owners who are required to plan their systems in accordance with the NERC Reliability Standards. SERC's mission is to ensure that there is a focus on the effective and efficient administration of BES reliability throughout its footprint. SERC's stakeholders in both its market and non-market areas share these concerns in how to plan, build, and operate the appropriate amount of generation and transmission to meet future needs. \$17.7 billion of transmission investment is anticipated within the SERC footprint over the next decade. SERC hopes this represents not just the right amount of transmission investment to accommodate the changing resource mix, but also that it is an application of transmission investment in the right places, as well.

Essential Reliability Services

Given the changing resource mix, it is crucial to maintain essential reliability services. The influx of wind and solar resources, demand response programs, battery storage, and other non-traditional generation resources threatens system inertia, which may lead to rotor angle and voltage stability issues across the interconnection. There is growing concern around "behind the meter" resources changing the characteristics of how the grid is planned and operated. Ensuring that frequency response, ramping, and voltage support can be maintained for all operating conditions must remain a vital component to entity planning processes. Coordinated efforts from Regional Entities like SERC in this area can provide immense support for continued reliability, regardless of what decisions are made for future generation and transmission needs.

Big Data

As a Regional Entity, SERC can provide a unique perspective on overall system reliability due to its ability to collect data from a wide range of industry stakeholders and

analyze the data in an impartial and independent fashion. Through its Compliance Monitoring and Enforcement (CMEP) program, SERC is able to capture data related to the overall risk an entity poses to the BES. Through its Reliability Assessment and Performance Analysis (RAPA) group, SERC captures operational data and provides trend analysis for the overall assessment of the BES reliability. In either case, SERC will share this data with registered entities to enable them to make educated decisions about addressing the risks they present.

System reliability lends itself to advanced data analysis because of the ability to spot trends, make corrections for weather patterns and geographic regions, and inform entities about specific areas they can potentially enhance their planning and operating practices. Through its data collection efforts, SERC will be able to monitor the coordinated expansion of the grid and inform its stakeholders of potential pitfalls along the way.

Conclusion

Working together with its members, SERC analyzes and improves the BES's ability to deliver reliable electricity to meet daily needs through its ongoing planning processes. The SERC Region will initiate analysis efforts, through staff and stakeholders, to identify and address all potential impacts and reliability risks that result from the changing BES including those that occur from environmental policies that affect the electric industry.

SERC continues to assist the industry through a number of external analysis activities:

- SERC performs wide-area analysis within its Region to identify reliability impacts based on unit assumptions.
- SERC collaborates with external parties like state commission or legislative staff to analyze the BES within its Region.
- SERC provides regional reliability assessments and analysis to determine the status of transmission and resource adequacy.

SERC establishes forums to discuss system impacts and reliability solutions.

The impact of various environmental rules will create an accelerated change in resource mix. In order to promote BES reliability, SERC will assess these reliability impacts within its Region and work with its members to ensure reliability is upheld. Results from the analysis will be used to inform industry discussions regarding the reliability impacts to generation and transmission adequacy throughout this transformation. In addition, SERC's analysis will inform NERC Reliability Assessments efforts, which are conducted on a national level.



SERC stands ready to assist the industry through its compliance, reliability, and outreach efforts to ensure the industry's transition to its future state occurs in a safe, thoughtful, and reliable manner.

I appreciate the opportunity to participate, and I look forward to answering any questions you may have.