Department of Energy
Washington, DC 20585

September 11, 2023

MEMORANDUM FOR THE CHAIR OF THE ELECTRICITY ADVISORY COMMITTEE

FROM: GENE RODRIGUES
ASSISTANT SECRETARY
OFFICE OF ELECTRICITY

GENE RODRIGUES Digitally signed by GENE RODRIGUES Date: 2023.09.12 09:42:05 -04'00'

Subject: FY 2024 Study Activities for the DOE Electricity Advisory Committee's Grid Resilience for National Security Subcommittee

The security of the grid is a necessary precondition for reliability and resilience, and we are grateful for the work the Department of Energy's Electricity Advisory Committee (EAC) Grid Resilience for National Security (GRNS) Subcommittee has accomplished since its establishment in 2020. We have identified *Securing Reliable Operations in a Transitioning Electric Grid* as our top study priority for the GRNS and recommend the Subcommittee initiate a project on that topic.

Such a project could investigate, clearly enumerate, and recommend mitigations for the security risks associated with the current technological, structural, and operational changes now occurring on the grid, with an eye toward identifying actions between now and 2030 that improve grid security *during the transition* while remaining adaptive and robust to multiple evolutionary pathways. Possible questions of interest include:

- What are the identified or detected risks, with respect to potential exploitation by malicious actors, posed by inverter-based resources and advanced power electronics? How can these risks be mitigated?
- What are the specific risks associated with the proliferation of electric infrastructure at the grid edge, including both connected behind-the-meter customer premises equipment (the "internet of [energy] things") and the mechanisms used to aggregate these Distributed Energy Resources (DERs) to provide grid services ("virtual power plants")? What actions are needed to manage these risks?
- Are there ways in which the proliferation of inverter-based resources (IBRs), grid edge equipment, and advanced power electronics could serve to mitigate existing security risks the electric grid faces from malicious actors?

- What changes are needed to grid systems and architectures to handle securely the data required to operate and coordinate these new technologies? What are the promising approaches for balancing security with the need for grid data access by a broader range of operational stakeholders? Where are the key risks in data communications, data storage, and use of third-party infrastructure (e.g., cloud services and communications networks)? How should the grid treat data privacy, transparency, and governance?
- Where are the key opportunities to most productively increase grid security by 2030, given the multifaceted, decentralized nature of the ongoing technology transition?

This topic is one currently seeing high interest in both conceptual thinking and research across the DOE complex. It would be particularly helpful to the Department for the Subcommittee to:

- Clearly and concretely define the threat landscape specific to these technologies and this transitional period;
- Originate potential findings and recommendations from real-world inputs and evidence, rather than conceptual frameworks (though organizing those findings *a posteriori* into such frameworks is helpful);
- Prioritize specific areas, technologies, or threat vectors of concern; and
- Provide specific, actionable recommendations for the Department, such as key technology gaps to target with R&D; areas of uncertainty to address by convening stakeholder groups; regulatory actions to support; or other activities.

The EAC is free, of course, to define the course of GRNS' research on this topic it sees as most productive and to take on additional related topics it deems important to investigate. GRNS must submit the work product to the full EAC for its review and action. We look forward to receiving EAC's advice to DOE on strengthening electricity grid resilience to support national security.

Designated Federal Officer: Jayne Faith, Senior Advisor, Office of Electricity