

Testimony of Acting Chairman Cheryl LaFleur
Senate Committee on Energy and Natural Resources
May 4, 2017

Good morning and thank you Chairman Murkowski, Ranking Member Cantwell, and Members of the Committee:

I appreciate the opportunity to appear before you today to discuss electromagnetic pulse (EMP) threats to the electric grid in the United States. I very much appreciate your attention to this important issue.

The Federal Energy Regulatory Commission (FERC) plays a key role in the oversight of grid reliability. In 2005, Congress entrusted FERC with a responsibility to approve and enforce mandatory reliability standards for the Nation's bulk-power system. Under the statute, FERC oversees the North American Electric Reliability Corporation (NERC) in developing standards to protect the reliability and security of the grid.

In addition to our work on mandatory standards, FERC has also supported grid security through collaborative efforts with federal agencies, states, industry, and stakeholders. This work is particularly well-suited to evolving threats that require action more quickly than a standard can be written. And as Sen. Murkowski noted, public-private communication on those threats is critical.

FERC, NERC, and industry have over the last decade put in place a robust set of baseline standards to address a wide range of reliability issues. In recent years we have been particularly focused on emerging threats to grid security, including cybersecurity, physical security and the risks associated with geomagnetic disturbances.

Geomagnetic disturbances to the bulk power system can be caused in two different ways: naturally occurring geomagnetic disturbances from solar activity and man-made EMP events.

EMPs can be generated by devices that range from small, portable suitcase units all the way through detonation of nuclear weapons in the upper atmosphere. EMP devices can generate three distinct effects: a short, high energy burst called E1 that can destroy electronics; a slightly longer burst that is similar to lightning, termed E2; and a third effect, E3, that generates electric currents in power lines and equipment, which can then damage equipment such as transformers.

In the case of GMDs, naturally occurring solar magnetic disturbances periodically disrupt the earth's magnetic field, which, in turn, can induce currents on the electric grid that may cause voltage instability or destroy key transformers over a large geographic area. GMD events are similar in character and effect to the final phase of EMP, E3.

I'll briefly touch this morning on some of the work FERC has done that can help address EMP.

First, FERC directed the development of standards on GMD that can help to mitigate the E3 effect of EMP based on a 1-in-100-years solar storm benchmark event. Second, FERC directed the development of a physical security standard, like the GMD standard now

effective and in place, that can help protect against attack from small, portable EMP devices, which require proximity to their intended targets.

Third, FERC has supported efforts to protect the resilience of the grid against all risks, which improves its ability to respond and recover from major outage events, whatever the cause. For example, mandatory reliability standards require backup capabilities for the loss of critical assets, which reduces the potential for cascading outages.

FERC has also issued orders concerning Grid Assurance and EEI's spare transformer equipment program, which are efforts to protect customers from prolonged outages by providing electric utilities timely access to emergency transmission equipment that otherwise would take months or longer to acquire.

As I expect we will discuss today, FERC has not to date directed NERC to develop a specific standard specifically targeting EMP. To be clear, I believe this is the result of reasoned consideration of the issue, not a lack of attention or willingness by FERC to address EMP threats. Although much work has been done there remains a significant amount of scientific research and debate under way about how EMP, particularly the E1 component, affects the electric grid.

I particularly want to highlight the work being done by DOE, Los Alamos National Lab, Idaho National Lab - an amazing place I visited a couple of years ago - DHS, and the Electric Power Research Institute, which I believe will help improve our understanding of EMP impacts on the electric grid and, more importantly, how best to target our actions to mitigate them.

FERC is closely engaged in all of these efforts to understand and address the EMP threat as more fully detailed in my written testimony. Those efforts will and must continue, and I am confident that should FERC determine that a reliability standard is warranted it will exercise its authority to require one as it has with other threats like GMD and physical security.

Thank you for the opportunity to testify, and I look forward to your questions.