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STATEMENT FROM
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SUBMITTED TO
THE COMMITTEE ON HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS
U.S. SENATE ROUNDTABLE FOR
“PERSPECTIVES ON PROTECTING THE ELECTRIC GRID FROM AN ELECTROMAGNETIC PULSE OR
GEOMAGNETIC DISTURBANCE”

Members of the Committee, thank you for the opportunity to share the views of American Transmission Company (ATC) on the important topic of protecting the grid from an electromagnetic pulse (EMP) or geomagnetic disturbance (GMD).

Formed in 2001 as the nation's first multi-state transmission-only utility, ATC owns and operates more than 9,600 miles of high-voltage transmission lines and 560 substations in portions of Wisconsin, Michigan, Minnesota and Illinois. ATC's total assets are nearly \$5 billion.

At ATC, steps have been taken to help mitigate the concern of an EMP or GMD event; however, we also recognize, that, as the research concludes, and more industry knowledge is gained, there may be more to do. Today, I would like to highlight some of the steps ATC has taken to prepare and harden its electric grid for an EMP or GMD event.

First, ATC purchased the first commercially available Neutral Insertion Device (NID), known as Solid Ground from ABB/EMPrimus in 2012. In 2015, ATC installed this transformer neutral-insertion device at a substation in the northern part of our service territory. This unique device is meant to automatically protect a transformer from harmful geomagnetic induced current (GIC) during a GMD event or an EMP E₃ pulse. This device was installed as a prototype on ATC's transmission system, and, to my knowledge, it is the only one like it installed and operational in the industry.

ATC learned about the device from the vendor – EMPrimus – at an industry conference. In reviewing the opportunity at the time and the ATC transmission system, it was determined that an ideal location existed on ATC's transmission system to install and test the capability of this device. It was a prudent investment to test the technology and gain experience for our company and the industry.

The unit was received in its most basic form but was, subsequently, modified and enhanced to make it fully automated and fully resilient. To date, the NID has performed according to its design parameters and has not failed. While automated, the setting to activate it is configurable. ATC chose to set the activation level lower than really needed to protect the transformer to garner more operations and operational experience.

The NID has operated automatically to block GIC more than several dozen times and has successfully kept GIC from flowing through the transformer to ground. No adverse operating complications have been experienced on the system due to the NID performing its intended function. In summary, the unit has performed as expected so far.

ATC Operations, Planning and Asset Management will continue to monitor the NID's performance over the next several years to gain confidence and familiarity with this technology should more NIDs be indicated in the future as a result of GMD studies and/or system events.

Second, ATC has installed GIC monitors on dozens of transformers to detect GIC and harmonics. Since GIC may impact each transformer differently, these sensors give our operations centers a broader view of system performance. In the case of an operation of the NID, these sensors also will provide us evidence if it is causing harmful impacts to other transformers.

Third, ATC is an active participant in the research at the Electric Power Research Institute (EPRI) for EMP vulnerabilities and mitigation. This three-year effort has reached some conclusions, but it is not expected to be finalized until April 2019. ATC expects to examine the findings and identify prudent opportunities to implement to mitigate EMP.

Fourth, ATC has taken steps to improve grid resiliency. Through strengthened communications and relationships with the Wisconsin Emergency Management and the Wisconsin National Guard, ATC has put into place improved procedures and secure communication channels to ensure that, should an event occur, ATC is better positioned to respond. ATC has mutual aid agreements with 57 utilities through membership in Edison Electric Institute (EEI) Spare Transformer Equipment Program (STEP) and the 20 utility members of Regional Equipment Sharing for Transmission Outage Restoration (RESTORE). Both provide assurances that ATC will have large power transformers available if a major weather or intentional terror attack should happen.

Thank you for the opportunity to share our information with you, and I look forward to questions you may have.