

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

)	
Reliability Standards for)	Docket No. RM15-11-000
Transmission System Planned)	
Performance for Geomagnetic)	
Disturbances)	

**ADDITIONAL COMMENTS OF THE EDISON ELECTRIC INSTITUTE,
THE AMERICAN PUBLIC POWER ASSOCIATION, ELECTRICITY
CONSUMERS RESOURCE COUNCIL, ELECTRIC POWER SUPPLY
ASSOCIATION, THE LARGE PUBLIC POWER COUNCIL, AND THE
NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION**

The Edison Electric Institute, American Public Power Association, Electricity Consumers Resource Council, Electric Power Supply Association, Large Public Power Council, and National Rural Electric Cooperative Association (collectively hereinafter “Trade Associations”) hereby respectfully offer the following brief follow up observations and comments on the Federal Energy Regulatory Commission (“FERC” or “Commission”) staff GMD technical conference held on March 1, 2016. Trade Associations have previously submitted extensive comments in this docket.

With the benefit of the robust discussions during the March 1 FERC staff led GMD technical conference, Trade Associations continue to strongly believe that TPL-007-1 offers the Commission at this time a reasonable set of requirements to address the

reliability risks under the 100-year benchmark GMD event as defined in the proposed standard. The North American Electric Reliability Corporation (“NERC”) standards development process has demonstrated its strength and effectiveness in this project. The NERC standard drafting team, with the leadership, active participation, and input from expert engineers and scientists from several government agencies and academic institutions, worked in an open and transparent process, produced a standard reflecting a sound technical basis that is the best possible under the current state of technical understanding, and achieved a strong ballot consensus in support of TPL-007-1. Trade Associations therefore continue to support timely approval of TPL-007-1 and its associated implementation plan.

Trade Associations appreciate the Commission’s continued examination of these issues as it considers the proposed NERC TPL-007-1 mandatory Reliability Standard. The conference plainly demonstrated that the GMD phenomenon and potential effects of GMD-induced effects on the bulk power system involve a highly complex technical area at the intersection of several fields of study, including geomagnetism and geoelectricity, and electric power system engineering. While it is correct that a significant GMD event could be viewed as a “black swan event,” it is best characterized as a “high impact, low frequency” phenomenon, for which there is a real but very low probability of a significant GMD event occurring in any given year. This supports the need to take prudent measures to mitigate the risks now, as proposed by NERC, in conjunction with additional research to better characterize and thoroughly discuss the nature of GMD and

the attendant risks to the Bulk Power System, and identify potential long-term solutions that reasonably align the science with engineering to manage these risks.

Presentations and discussion at the technical conference also plainly demonstrated that advanced mathematical models capable of repeatable and reliable results to estimate potential geomagnetically induced current (“GIC”) over space and time continue to evolve. Related data collection also continues to expand and improve, including the installation of measurement devices for geomagnetic fields, geoelectric fields and GIC across the United States and Canada. As a result, Trade Associations envision that a mathematically precise characterization of a 100-year benchmark GMD event will continue to attract considerable discussion and debate going forward. As Trade Associations understand the issues, the scientific and mathematical experts’ inquiry on the technical specifications of a 100-year benchmark will likely continue for several years.

In addition, Trade Associations also believe that the technology available to mitigate or control GIC caused by a GMD event of historic scale is only beginning to be developed. Existing technology such as “blocking devices” does not provide simple solutions, and is expensive. Such devices continue to be experimental in nature, and require very careful planning, installation, and operations considerations. For example, one recent study shows that adding blocking devices to reduce GIC in some transformers tends to elevate GIC in other transformers. The authors also make the point that blocking devices in the neutral grounding conductors of autotransformers cannot reduce GIC that

flows in the series windings of autotransformers. As a result, even widespread application of blocking devices may be only marginally effective in reducing total system MVar demand.¹ Blocking devices may be very helpful in particular cases, but are not a panacea.²

As suggested by the conference, and consistent with other extreme natural events, a historic GMD event may cause extensive application of load shedding as companies take facilities offline in order to prevent severe damage or destruction. Orderly shutdown and restoration could become a strategic region-wide mitigation activity in an extreme GMD event.

Considerable discussion took place at the conference on the subject of data collection, management, and access. As a general matter, Trade Associations agree that there is merit for expanded access for legitimate technical inquiry by qualified organizations and individuals. This calls for further discussion to define goals and objectives, management principles, datasets for which access could take place, and careful consideration of data collection and management processes, non-disclosure matters, and critical energy infrastructure information (“CEII”) protections for certain data.

¹ Qun Qui, Jeffrey A. Fleeman, and David R. Ball, *Geomagnetic Disturbance*, IEEE Electrification Magazine, December 2015

² See comments filed in this docket by American Transmission Co. describing its experience with design, installation, and operations issues involving its recently installed blocking device.

Trade Associations oppose public disclosure of transmission planning studies performed under the NERC TPL standards, as suggested by a technical conference panelist. Transmission planning studies are CEII that could well provide roadmaps for physical and cyber attacks on the grid. FERC and the industry should continue to protect the security of this information. Moreover, these studies are developed and owned by individual companies and involve sensitive business proprietary information, and must not become publicly available.

GIC measurements, while not as sensitive as transmission planning studies, should also be protected. Advanced data analytics have achieved remarkable success in other areas. A potentially malicious actor could conceivably combine GIC information with information from other sources to deduce the configuration and operating conditions of the grid or some portion of it.

On the other hand, geomagnetic, geoelectric, geologic and geotelluric data gathered by government agencies and by academic and research institutions is generally not proprietary is less apt to be abused and is already widely shared.

Again, and as stated in the Trade Associations' initial comments filed in the docket, Trade Associations strongly believe that the Commission has developed a reasonable foundation to support its approval of TPL-007-1 and the associated implementation plan, and encourages the Commission to move forward by approving them. As stated in comments filed by Trade Associations in the docket, the Commission

can revisit the issues. NERC is capable of tracking these developments and ensuring consideration of them in the future.

Respectfully submitted,

/s/ James P. Fama

Edison Electric Institute
James P. Fama
Vice President, Energy Delivery
Aryeh B. Fishman
Associate General Counsel,
Regulatory Legal Affairs

Nancy Bagot
Senior Vice President
Jack Cashin
Director, Regulatory Affairs
Electric Power Supply Association
1401 New York Ave, NW, Suite 1230
Washington, DC 20005
(202) 628-8200
nancyb@epsa.org

Jonathan D. Schneider
Stinson Leonard Street, LLP
1775 Pennsylvania Avenue NW, Suite 800
Washington, D.C. 20006
(202) 728-3034
jonathan.schneider@stinsonleonard.com
jonathan.trotta@stinsonleonard.com

/s/ Randolph Elliott
American Public Power Association
Allen Mosher
Vice President, Policy Analysis
Randolph Elliott
Senior Regulatory Counsel
2451 Crystal Drive, Suite 1000

Arlington, VA 22202
(202) 467-2900
amosher@publicpower.org
relliott@publicpower.org

/s/ John P. Hughes
Electricity Consumers Resource Council
John P. Hughes
Chief Executive Officer
1101 K Street, NW, Ste. 700
Washington, DC 20005
jhughes@elcon.org

/s/ Paul M. Breakman
Paul M. Breakman
Associate Director, Regulatory Counsel
Patricia E. Metro
Manager, Trans. & Reliability Standards
National Rural Electric Cooperative Association
4301 Wilson Boulevard
Arlington, VA 22203