UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Reliability Standard for Transmission System Planned Performance for Geomagnetic Disturbance Events	)))	Docket No. RM15-11-000

PREPARED REMARKS
OF
MIKE STECKELBERG, GREAT RIVER ENERGY

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INTRODUCTION

Great River Energy (GRE) is an electric generation and transmission (G&T) cooperative, with facilities located in Minnesota and North Dakota. We are the second-largest electric power supplier in the state of Minnesota. GRE supplies the majority of the electric needs for twenty-eight (28) member distribution cooperatives in Minnesota. As a G&T cooperative, GRE is owned and operated by the members it serves and returns surplus revenues to its members proportionate to their use of the cooperative, not proportionate to any ownership share. Simply put, GRE is motivated by service to its members.

GRE owns approximately 668 miles of transmission lines and 37 transformers operated at voltages above 200 kV, and will therefore require a characteristic review of those assets to comply with the requirements included in the NERC Reliability Standard TPL-007-1 Transmission System Planned Performance for Geomagnetic Disturbance (GMD) Events. In addition, GRE has approximately 3,500 miles of transmission lines operated at voltages less than 200 kV that are connected to the low side of autotransformers and may contribute to the Ground Induced Currents (GICs) caused by the GMD events. GRE also is a partner in the CapX2020 projects which have recently added an additional 800 miles of 230 kV and 345 kV transmission lines, mostly located in Minnesota.

GRE owns and operates a 1200 MW generating station in North Dakota that supplies power over a 436-mile-long HVDC transmission line. At both the converter and inverter substations, GRE owns large power transformers which are base-loaded at nearly full capacity almost 100% of the time.

Because GMDs are real events that will continue to occur with some degree of impact to the Bulk Electric System (BES) in certain regions such as Minnesota, GRE supports the efforts to develop a standard that starts a process to assess these effects to the electric system. As a proactive effort, GRE has installed ground current monitors in the larger power transformers at the HVDC terminals and is correlating data from the monitors with GMD events. During a recent K6 event in December of 2013, there were no significant changes to the monitored GIC levels. These events caused no system impacts, nor were changes to the GRE real-time system configuration needed during the event.

GENERAL COMMENTS

Reliability analysis of the electric transmission system is an ongoing challenge. New issues have come about due to changing uses of the system, such as the addition of non-synchronous generation (solar PV and wind), new transmission technologies (SVCs, FACTs devices), longer transmission lines, and market access. These issues have brought about challenges such as increased harmonics, subsynchronous resonance, and voltage collapse (due to the transfer of power over longer distances). High voltage, caused by the addition of longer transmission lines, during light load periods is also becoming an increasing planning and real-time operations challenge.

These challenges are being addressed through modeling, development of corrective action plans, and feedback from transmission operators about the effectiveness of the solutions. Protective devices, such as relays and Remedial Action Schemes (RAS), are used to protect the BES by automatically adjusting the system to avoid damage.

The analysis of impacts to the electric system due to GMD events is another engineering challenge that can be addressed through proper modeling with proper data. However, due to the unpredictability of GMD events, even the best modeling and the best data will not entirely eliminate the risk. To date, GRE has not experienced equipment damage because of a GMD event. System protective devices, using existing or new technologies, will likely be required as backup to corrective action plans developed by transmission planners.

COMMENTS TO TPL-007-1

As a transmission owning and transmission planning member of the Midcontinent Independent System Operator (MISO), GRE will develop internal processes to gather the data necessary for the GMD assessments to meet the requirements of the TPL-007-1 standard. Due to the fact that the data required will be for pseudo-DC calculations, the data may or may not be readily available, particularly for transformers. GRE has just begun the internal process of assessing the availability of the necessary data. Some of the data needed, such as characteristics of the transformer (DC resistance, core form or shell form, number of legs), is not readily available in standard computerized database records. Other information, such as DC grounding resistances of substations, DC resistances of lines operated at 60 Hz AC, and GPS locations of substations, will also be needed. A manual review of paper or digitally-scanned records will likely be required to gather this data, and could take some time even for a relatively small utility such as GRE.

CONCLUSION

GRE supports efforts to develop a standard that starts a process to assess the impacts of GMD events on the electric system. GMDs are real events that will continue to occur, and planning for these events to reduce the risk to transmission assets is particularly important.

It is important that the GMD event assessment process move forward starting with the gathering of the data necessary to develop the proper modeling of the transmission topology for the GIC calculations. GRE is confident that sufficient time will be allowed for the responsible entities to comply with the requirements in the standard, which is why GRE supports the approval of the TPL-007-1 standard as filed with FERC to allow this process to begin in earnest. As a Transmission Owner and Transmission Planner, our staff is looking forward to working with MISO, the GRE Planning Coordinator, to comply with the standard.

Respectfully submitted,

Great River Energy

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