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Update on the US GIC activities and generation of benchmark geomagnetic disturbance (GMD) scenarios

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The awareness about potential major impacts of geomagnetically induced currents (GIC) has drawn a high level action in the US and in Canada. More specifically, regulatory process has been launched to generate standards for GIC hazard assessments and mitigation procedures. All US high-voltage power transmission-related entities need to follow the standards in the near future. One of the central GIC activities in the US has been the North the American Electric Reliability Corporation's (NERC) GMD Task Force that has allowed in-depth communication and collaboration between US federal organizations, power transmission operators and scientific research community. I will discuss these activities in this paper and outline the road ahead for some of the key US GIC activities.

As a part of the GMD standards drafting process and the US GIC hazards assessments, substantial effort has been made for generating benchmark GMD scenarios. These scenarios that quantify extreme geoelectric field magnitudes and temporal waveforms of the field fluctuations are the foundation for subsequent engineering analyses. The engineering analyses will include the transmission system voltage stability and transformer heating assessments. The work on the GMD scenarios has been a major collaboration between a number of US and Canadian entities involved in GMD research and transmission system operations. I will discuss in this paper also the key elements of the benchmark GMD generation process and show the latest results from our NASA GSFC work on the topic.

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