

Emerging Issue #RAS-4: Geomagnetic Disturbance Impacts to System Operations and Communications

Emerging Issue	Item	Specifics
Horizon	Number of years	On-going and beyond
Status	Emerging or Standing	Emerging
	Technical Group	Geomagnetic Disturbance Task Force
Background	Description	The NERC GMDTF Interim Report forecast that the most likely result from a strong geomagnetic disturbance is voltage collapse. NERC also accepted that particularly large geomagnetically induced current (GIC) flows can result in transformer damage, and may ultimately result in the failure of some transformers. The industry is well-equipped to face a small number of transformer failures; however, due to the concerns about an extreme GMD event causing a larger than expected number of failures, it is important to carefully quantify the nature of the reliability risk.
	What changes during the 10-year horizon?	The solar peak occurs in May 2013, but large earth directed solar flares can occur at any time and could have widespread impact on bulk power system operations.
	What is the impact to regional reliability?	Regions that are situated on top of areas with high ground conductivity may be at greater risk for the introduction of GIC into the bulk power system. These currents can impact real-time operations and equipment, depending on the duration and severity of the occurrence.
Assessment Factors	Resource Adequacy Considerations [Yes/No]?	Yes. System study and analysis is needed to determine the potential contingencies that may develop and the impact of units' availability to be dispatched to provide reactive support during the onset of a large geomagnetic storm.
	Transmission Adequacy Considerations [Yes/No]?	Yes. System study and analysis is needed to determine the potential contingencies that may develop from the introduction of large GIC into the bulk power system.
	Resource Siting Impacts [Yes/No]?	No
	Operations Impacts [Yes/No]?	Yes. Real-time operations could be impacted as reactive demands increase as transformers experience thermal heating from geomagnetically induced currents. If reactive demands and geomagnetic currents are not properly monitored, situations could develop where an uncontrolled cascade of the bulk power system due to the introduction of geomagnetically induced currents ultimately resulting in voltage collapse.

2012 LTRA Emerging and Standing Issues Templates

	Remaining Uncertainties	Yes. NERC will be performing a wide-area transformer vulnerability assessment to determine the potential impacts to the bulk power system from a large geomagnetic disturbance. The results of this work will be reviewed through the Geomagnetic Disturbance Task Force and the NERC Planning Committee and Operating Committee.
Additional Comments		For more information and background on the impact of Geomagnetic Disturbances, please reference the <i>2012 Special Assessment: GMDTF Interim Report – Affects of Geomagnetic Disturbances on the bulk power system.</i>