



Geomagnetic Disturbance Study Protocol

Studies Subcommittee

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Purpose

The electric power industry has recognized that during a geomagnetic disturbance (GMD) event, geomagnetically-induced currents (GIC) may cause transformer hot-spot heating or damage, loss of Reactive Power sources, increased Reactive Power demand, and Misoperation(s), the combination of which may result in voltage collapse and blackout. NERC has established a reliability standard to evaluate Transmission System Planned Performance for Geomagnetic Disturbance (GMD) Events (TPL-007). In the Western Interconnection there is a desire to create a single interconnection-wide data set to assist WECC Members achieve compliance with that standard.

This desire is met in two ways:

1. The System Review Subcommittee (SRS) is responsible for establishing data requirements and overseeing the development of the GIC modeling data and validation of the data.
2. The Studies Subcommittee (StS) is responsible for overseeing and reviewing the GMD results to help WECC Members meet their compliance obligation to NERC Reliability Standard TPL-007-2.

The purpose of this document is to describe the processes for implementing the GMD work.

Scope

As defined in TPL-007 R4 and R8, WECC will perform an interconnection-wide assessment to determine GIC currents on “On-Peak” and “Off-Peak” cases modeling at least one year within the Near-Term Transmission Planning Horizon. WECC will coordinate with the SRS to obtain any data that is needed to perform this assessment. WECC will store all the GIC data that has been provided by the SRS in all operating cases starting in 2021 as specified in the “2021 Data Preparation Manual.” These cases will be posted on the WECC website. WECC will perform this assessment every third and fifth years. Starting with the 2019 assessment (2020 power flow cases).

The GIC modeling data will be treated as CEII data as specified in our Information Sharing Policy and the assessment reports will be treated as public data.

GMD Study Program Process

The following steps will be undertaken in performing the GMD Study:

1. The GIC data collection will be collected in each operating case as specified in the Data Preparation Manual.
2. WECC staff will perform a GMD simulation on the “On Peak” and “Off Peak” cases as specified in the applicable NERC standard, annually.
 - a. The storm direction varied from every 30 degrees between 0 to 150 degrees



3. WECC staff will develop and make available simulation results that include:
 - a. The Maximum Effective GIC for the applicable transformers
 - b. The GIC(t) for the applicable transformers
 4. WECC staff will make available all necessary information to reproduce the results including:
 - a. Post the cases and GIC data used for the assessment.
 5. StS and SRS will review the posted materials and check for any potential errors.
 6. StS will approve the simulation results.
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Disclaimer

WECC receives data used in its analyses from a wide variety of sources. WECC strives to source its data from reliable entities and undertakes reasonable efforts to validate the accuracy of the data used. WECC believes the data contained herein and used in its analyses is accurate and reliable. However, WECC disclaims any and all representations, guarantees, warranties, and liability for the information contained herein and any use thereof. Persons who use and rely on the information contained herein do so at their own risk.

Version History

Modified Date	Modified By	Description
2020-11-23	StS	Updated committee acronyms and occurrence of studies