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Common Information Model for Electromagnetic Transients (CIM for EMT)

CRADA 533 (PNNL 77821)

December 2021

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Abstract

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Abstract

The control and protection functions of inverter-based resources (IBR) have raised concerns with bulk system reliability. Most of the current interest lies with solar photovoltaic generation but increasing amounts of storage would pose the same risks. Newer North American Electric Reliability Corporation (NERC) guidelines call for electromagnetic transient (EMT) studies of IBR and recommend that transmission operators collect distributed energy resource (DER) data to support such modeling. IEEE Standard P2800.1 is defining tests for model parameterization, so good model data should become available from inverter vendors. (EMT studies also apply to large power transformer reliability, and transformer vendors can provide EMT models.)

Utilities don't currently have the rest of the bulk system represented for EMT studies at large scale. An International Electrotechnical Commission (IEC) standard Common Information Model (CIM) provides a way of supporting these detailed models from physical asset data, e.g., conductors, towers, transformer data sheets, control block diagrams, while avoiding software vendor lock-in. CIM-for-EMT, with proposed schema extensions and open-source converters, provides a way to exchange EMT data between organizations and tools. This project leverages Office of Electricity (OE) funding of CIM-for-EMT code base through the GridAPPS-DTM project, and of GridPACKTM (parallelized transmission solver), for interoperability testing in CIM-for-EMT. The project also leverages partner PGSTech investments in EMTP® interoperability with CIM.

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