[NAERM] North American Energy Resilience Model

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Challenge:

The Nation's energy resilience is dependent on an ability to provide national-scale energy planning and real-time situational awareness. While each energy domain has some capability to support such national-scale modeling, given scalability and other barriers, there was not a DOE modeling capability that could span interdependent energy domains. The North American Energy Resilience Model (NAERM) was developed to provide such a capability to the Nation and ensure reliable and resilient delivery of energy across multiple energy sectors.

Technical Approach:

The overall technical approach of NAERM is to bring together the best capabilities and resources of eight national laboratories to build a software platform that supports co-simulation and analysis of the North American energy system. Los Alamos is supporting this effort by providing natural gas modeling and analysis expertise in collaboration with Argonne National Laboratory, leadership in validation, verification, and uncertainty quantification, and methods for identifying critical components in energy systems. This includes integrating Los Alamos' natural gas modeling software, **GasModels**, into the HELICS co-simulation platform and the broader NAERM software system.

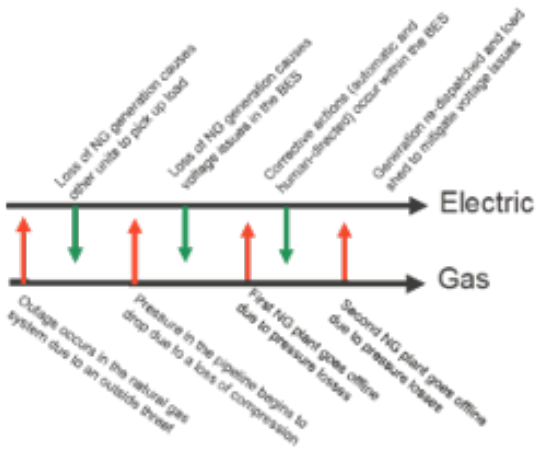

Figure 5-7: A schematic of the types of co-simulation resilience use cases NAERM is designed to model.

Impact:

NAERM supports DOE's provision of situational assessment advice to industry and government. This advice is intended to ameliorate the risk of and consequence of large-scale service disruptions between infrastructure domains. The NAERM is advancing the state-of-science in planning and operations of energy supply during extreme events and provide rigorous resilience and associated economic metrics for these sectors.