SGC WEBINAR

Modeling and Analysis of Interdependent Electric Power Grid and Natural Gas Network
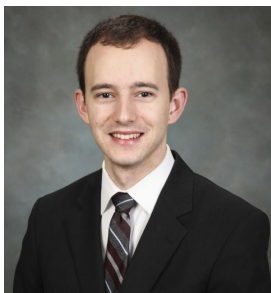
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This presentation will discuss research efforts related to modeling and analyzing the interdependent infrastructure networks of the electric power grid and natural gas pipelines. Texas gets over 50% of its electric power from natural gas-fired generating facilities. In addition, many natural gas delivery system components are dependent upon electric power for operation. In planning for extreme events, such as the winter weather experienced in February 2021, there are potential benefits to enhancing modeling capabilities such that the combined impact to the energy delivery infrastructure can be analyzed. One challenge in this effort is the difficulty of data access for infrastructure data due to its status as Critical Energy Infrastructure Information (CEII) as defined by the Federal Energy Regulatory Commission (FERC). This presentation will discuss modeling capabilities, as well as recent efforts to build high-quality public synthetic test cases of the combined electric-gas grid to enhance research capabilities and enable conducting joint vulnerability studies. The team has developed and published an initial test case with 47 gas nodes and 173 electric buses, and is in the process of developing a case with several thousand nodes, geographically located in Texas.

September 21, 2022 at 3:00 P.M. CDT

Register in advance HERE

Adam B. Birchfield is an Assistant Professor in the Department of Electrical and Computer Engineering. Prior to this he was a research engineer at the Electric Power Research Institute (EPRI). He received the B.E.E. degree from Auburn University in 2014, M.S. in electrical and computer engineering from the University of Illinois at Urbana-Champaign in 2016, and Ph.D. in electrical engineering from Texas A&M University in 2018. Dr. Birchfield's research is in power system modeling, large system transient dynamics, applications of synthetic power grid datasets, and the resilience of power systems to high-impact, low-frequency events.