PSERC Power Systems Engineering Research Center

PSERC WEBINAR

Weather-grid impact model: Gas-Fired Generators Under Extreme Winter Weather

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Quantifying power grid resilience to extreme weather events necessitates the development of robust and accurate weather-grid impact models. These models are critical not only for predicting how grids will perform under future extreme weather conditions, but also for informing strategic planning, operational decision-making, and assessing the costs and potential for effective risk mitigation. In this presentation, we specifically focus on advancing weather-grid impact models for gas-fired power plants during extreme winter conditions, an increasingly important concern as climate variability intensifies. We introduce a data-driven approach to model the net available capacity of gas-fired generators (and the associated uncertainty) under extreme winter conditions, considering ambient temperature and total demand as key exogenous variables. We utilize extensive datasets, including those from GADS, NOAA, and demand information from NYISO and ISO-New England, to develop a comprehensive understanding of generator behavior during these events. Our findings emphasize the critical role of data-driven approaches in developing accurate predictive models and enhancing grid preparedness for extreme weather events.

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LINK TO WEBINAR

(10:00-11:00 A.M. PT)

Anamika Dubey received her Ph.D. degree in Electrical and Computer Engineering from the University of Texas at Austin in Dec 2015. She is currently Huie-Rogers Endowed Chair Associate Professor of Electrical Engineering in the School of EECS at Washington State University (WSU), Pullman. She also holds a joint appointment as a Research Scientist at the Pacific Northwest National Laboratory (PNNL) and currently serves as the Co-director for the WSU-PNNL Advanced Grid Institute. Her research focuses on the scalable integration of cross-domain models and data to provide better decision support for increasingly complex electric power grids. Currently, her lab is actively working on climate change adaptation solutions for the power grid via hazard modeling, risk-averse planning, and distributed operations. She is a recipient of the National Science Foundation CAREER Award (2019) and the IEEE PES Outstanding Young Engineer Award (2023).