Power Systems Engineering Research Center

Synthetic Power Grid Models: What are They, How They're Made, and Why They Matter

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Description: The U.S. electric grid is perhaps the most critical of all of the U.S. infrastructures. As a result, much of the data needed by researchers to test and validate new tools and techniques on actual power grid models is restricted. While some data is available through nondisclosure agreements, it cannot be freely shared. This limits the ability of the power community to adhere to the basic scientific principle of reproducibility of results by others. The power system models that are publicly available, such as the IEEE 118 bus case, are often inadequate for modern research and development. This talk addresses this problem by discussing the creation of large-scale, geographically-based, fully public synthetic power grid models. The talk covers needed characteristics in these models, how such models can be created, and why they matter both to researchers and also to power engineers with ready access to restricted models of the actual grid.

Biography: Thomas J. Overbye is the Fox Family Professor of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign where he has taught since 1991. He received his BS, MS, and Ph.D. degrees in Electrical Engineering from the University of Wisconsin-Madison. His current research interests include electric power system analysis, visualization, dynamics, cyber security and power system geomagnetic disturbance modeling. Dr. Overbye is the original developer of PowerWorld Simulator, an innovative computer program for power system analysis, education and visualization. He is also a co-author of the book Power System Analysis and Design, and a member of the US National Academy of Engineering.