



# PSERC WEBINAR

## Reliability Evaluation of Renewable Generation Integrated Power Grid Including Adequacy and Dynamic Security Assessment

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The growing penetration of variable renewable sources and the competitive power system environment make the application of probabilistic reliability techniques all the more important. Although probabilistic methods have been widely used in resource adequacy assessment, using probabilistic methodologies for reliability evaluation including system dynamic security need to be investigated. This work proposes a probabilistic methodology for integrated reliability evaluation considering resource adequacy and dynamic security assessment in a unified framework. Sequential Monte-Carlo Simulation (SMCS) is chosen because of its ability to consider time varying sequential characteristics. By using an optimization model, which minimizes load curtailment for adequacy assessment, and representing stability preserving protection systems in security assessment, the proposed approach gives quantitative integrated reliability evaluation results. In addition, two acceleration methods are introduced to improve computational efficiency. The proposed approach is demonstrated on a synthetic test system and the results illustrate the efficacy of an integrated reliability evaluation approach.

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**Vijay Vittal** received the B.E. degree in electrical engineering from the B.M.S. College of Engineering, Bengaluru, India, in 1977, the M.Tech. degree from the Indian Institute of Technology Kanpur, Kanpur, India, in 1979, and the Ph.D. degree from Iowa State University, Ames, IA, USA, in 1982. From 1982 -2005 he was on the faculty of the Department of Electrical and Computer Engineering at Iowa State University. He joined Arizona State University in 2005. He is a Regents' Professor and the Ira A. Fulton Chair Professor with the Department of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ, USA. He is currently the Director of the Power Systems Engineering Research Center, Arizona State University. He is a member of the National Academy of Engineering.

