Seamless Integration of Wind Generation

ABSTRACT

Wind energy has gained extensive interest and has become one of the most mature renewable energy alternatives to the conventional fuel-based resources. The development of wind power generation has rapidly progressed over the last decade. Records show that wind power generation has expanded at an annual rate of 25 percent since 1990 and demonstrates a great potential in many regions of the US. According to the record from National Renewable Energy Laboratory, Texas is the No. 1 in US regarding the installation capacity of wind generation facilities. Despite various benefits of the wind power, an integration of wind energy into the electric grid is difficult to manage. The main challenge is associated with its unpredictability. Due to the irregularity of wind, the power generated from wind rapidly fluctuates, imposing difficulties both in terms of operation and planning.

This presentation describes the development, installation, potential impact, and opportunities of wind generation.

PRESENTER:

Wei-Jen Lee (S'85-M'85-SM'97-F'07) received the B.S. and M.S. degrees from National Taiwan University, Taipei, Taiwan, R.O.C., and the Ph.D. degree from the University of Texas, Arlington, in 1978, 1980, and 1985, respectively, all in Electrical Engineering.

In 1985, he joined the University of Texas, Arlington, where he is currently a professor of the Electrical Engineering Department and the director of the Energy Systems Research Center .

He has been involved in the revision of IEEE Std. 141, 339, 551, and 739. He is the Vice Chair-Technical of the IEEE/IAS, Industrial & Commercial Power Systems Department (ICPSD), the associate editor of IEEE/IAS and International Journal of Power and Energy Systems, and the project manager of IEEE/NFPA Collaboration on Arc Flash Phenomena Research Project.

Prof. Lee has been involved in research on renewable energy, power flow, transient and dynamic stability, voltage stability, short circuits, relay coordination, power quality analysis, demand response, on-line equipment protection, monitoring, and control system, and utility deregulation. He has served as the primary investigator (PI) or Co-PI of over ninety funded research projects. He has published more than two hundred sixty (260) journal papers and conference proceedings. He has provided on-site training courses for power engineers in Panama, China, Taiwan, Korea, Saudi Arabia, Thailand, and Singapore. He has refereed numerous technical papers for IEEE, IEE, and other professional organizations.

Prof. Lee is a Fellow of IEEE and registered Professional Engineer in the State of Texas.