Technical Presentation Session
Sponsored by IAS Young Professionals and Alumni of CMD

POWER AND ENERGY

Keynote Lecture

Wei-Jen Lee, PhD, PE | Professor and Director, Energy Systems Research Center, The University of Arlington | IAS President Elect 2019-2020

Biography: Professor Lee received the B.S. and M.S. degrees from National Taiwan University, Taipei, Taiwan., and the Ph.D. degree from the University of Texas, Arlington, in 1978, 1980, and 1985, respectively, all in Electrical Engineering.

In 1986, he joined the University of Texas at 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, 739, 1584, and 3002.8 development. He is the President Elect of the IEEE Industry Application Society (IAS) and an editor of IEEE Transactions on Industry Applications and IAS Magazine. He is a member of IEEE Fellow Committee. He is the project manager of IEEE/NFPA Collaboration on Arc Flash Phenomena Research Project.

Prof. Lee has been involved in research on Utility Deregulation, Renewable Energy, Arc Flash Hazards and Electrical Safety, Smart Grid, MicroGrid, Industrial Internet of Things (IIoT) and Virtual Power Plants (VPP), AI for Load, Price, and Wind Capacity Forecasting, Power Quality, Distribution Automation, Demand Response, Power Systems Analysis, Short Circuit Analysis and Relay Coordination, Distributed Energy Resources, Energy Storage System, PEV Charging Infrastructure Design, AMI and Big Data, On Line Real Time Equipment Diagnostic and Prognostic System, and Microcomputer Based Instrument for Power Systems Monitoring, Measurement, Control, and Protection. He has served as the primary investigator (PI) or Co-PI of over one hundred funded research projects with the total amount exceed US$17 million dollars. He has published more than one hundred and seventy-five journal papers and two hundred ninety 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, IET, and other professional organizations.

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

Keynote Lecture 2

Demand Response – An Assessment of Load Participation in the ERCOT Market

Power Point Presentation, 30 min

Abstract

Over the past twenty years, the electric power utility industry in North America and other countries have experienced a strong drive towards deregulation. Based on the experience of the deregulation of the telecommunication, natural gas, and airline industries, people have considered the necessity of deregulating electric utilities to improve the operation efficiency and lower energy costs.

The opening of the Electric Reliability Council of Texas (ERCOT) grid to wholesale competition began in 1996 that initiated the first stage of deregulation in Texas. The ERCOT ISO has the responsibilities of ensuring reliable power grid operations in the ERCOT region jointly with the electrical energy industry organizations that operate within that region, ensuring open access to transmission ERCOT wide and distribution systems in areas permitting competition, ensuring the timely conveyance of market information to market participants, and ensuring accurate accounting of power produced and delivered

Demand response is an essential element of competitive wholesale electricity markets. For the purpose of

providing customers the opportunities and rights to choose power, many ISOs/RTOs have developed load participation or demand response (DR) programs. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Demand Resources providing Regulation Service automatically respond to changes in grid frequency (similar to the governor action on a generator), and also are subject to continuous dispatch based on instructions from the System Operator (similar to Automatic Generation Control).
Depending on each ISO/RTO's system and market design characteristics, the DR products and services may vary. However, all demand response can be categorized as one of the following products:
- *Energy*: Demand Resources are compensated based solely on demand reduction performance during a Demand Response Event.
- *Capacity*: Demand Resources are obligated over a defined period of time to be available to provide Demand Response upon deployment by the System Operator.
- *Reserve*: Demand Resources are obligated to be available to provide Demand reduction upon deployment by the System Operator, based on reserve capacity requirements that are established to meet applicable reliability standards.
- *Regulation*: Demand Resource increases and decreases Load in response to real-time signals from the System Operator.
This presentation introduce the deregulated market structure and discusses the evolution of the DR programs in the ERCOT market.

Lectures of IAS YPs and CMD Alumni

Richard Cselko, PhD (BUTE), Senior lecturer, Budapest University of Technology and Economics (BUTE), Hungary / Founder Chair of the BUTE IAS/PES Joint Student Brach Chapter, Currently Advisor / IAS CMD | Student Technical Conference Committee

Biography: Masters and PhD degree in electric power engineering at the Budapest University of Technology and Economics. Currently Senior lecturer and the vice-head of the High Voltage Laboratory. Extensive experience in insulation diagnostic techniques, design of high voltage tests and components, partial discharge measurements and statistics based maintenance planning applied to industrial power systems, electrical safety of linemen on high and medium voltage power lines. Outstanding leader of his students, many of them receiving prestigious national and international awards. Experience in accredited testing of high voltage assets according to the ISO 17025 standard. Broad experience in organizing international scientific conferences and a broad volunteering activity in national and international level.

Asset Management in the Smart Grid Area

Power Point presentation, 30 min.
The vast amount and value of assets built in the power grid require an effective operation and lifetime management. Replacing assets only based on their age is not acceptable, as useful lifetime may be lost. A balance has to be found between using the assets to the maximum while keeping the risks of failures to the required level. The presentation sheds the light on some ideas and approaches that enable better operation in the smart grid era.

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