University of Macau
Faculty of Science and Technology

Distinguished Lecture

Title:	The Drivers, Major Technical Components of Smart Grid and its Implementations
Speaker:	Prof. YU Yixin Professor of School of Electrical and Automation Engineering, Tianjin University, Tianjin 300072, China
Language:	English
Date and Time:	21 January 2010 (Thursday) 11:00 a.m.
Venue:	HG01, Ho Yin Convention Centre

Abstract

In last several years, the concept of smart grid has been proposed to address those challenges that the existing electric grid is facing with, such as large scale power system cascading events, increasing DER interconnection, low asset utilization, and increasing demand and reliance on digital applications, etc. This seminar describes the scope, characteristics and major technical components of smart grid. Demand response and distributed renewable resource integration not only can serve the needs of sustainability, but also can relieve the demand for transmission and generation capacities. While many interests and efforts have been taking on Advanced Transmission Operations (ATO), other smart grid components as Advanced Metering Infrastructure (AMI), Advanced Distribution Operations (ADO) and Advanced Asset Management (AAM) should be investigated as well. Reconfigurable distribution network and Integrated Energy and Communication System Architecture (IECSA) are the foundation of future smart grid, so they should be integrated in system planning from now. The associated smart grid benefits, challenges and worldwide implementations are also summarized. It is emphasized that although the smart grid implementation is promising, it faces huge challenges. The migration to smart grid is a long journey when various technologies will coexist which requires thoughtful planning. Progress in developing the Smart Grid will strongly and broadly support the Administration's polices to advance energy and climate cyber security, while boosting the developments of various technologies, so wide range of industrial participants should be encouraged.

About the speaker

Professor Yixin Yu at Tianjin University has been teaching and doing research work in the area of Power System Stability Analysis, especially in security region methodology of power system, over several decades. The idea of security region would make real-time security monitoring, assessment, control and pricing of power systems more scientific and efficient. Due to the complexity of power systems, the research in security region was largely confined to the theoretical stage. Prof. Yu has pursued this line of research persistently and has achieved systematically significant original accomplishments both in theory and practical applications. It has most promising prospect of practical applications.

Prof. YU and his research team have developed a comprehensive set of theory，models and methods in the area of urban power distribution system expansion planning. Based on that, they developed a perfect urban power distribution system expansion planning system with independent intelligent right and more complete functions, which has been widely used in China such that the practices of urban power distribution system expansion planning in China have become more scientific. It has gained tremendous economic and social benefits and represents the leading1technology in this field.

As the first awardee, he gained one National Second-class Award of Science and Technology of China and 3 First-class Awards of Science and Technology of Province or Ministry of China. He has published over 200 archival papers and 4 books entitled “Security and Stability of Power System” and “Theory and Methods of Power System Stability” and so on. Among the doctors supervised by him, one has been appointed a special position of Professor titled Changjiang Scholar, one gained National Excellent Doctor Dissertation Award.

Since the middle of 2006, he has been working on Smart Grid.

Professor Yu is elected as Academician of Chinese Academy of Engineering in 2005.

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