

Presentation Title : Flexible LCC HVDC System

Speaker: Professor Xiao-Ping Zhang, University of Birmingham

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Abstract:

It is well-known that traditional LCC (Line Commutated Converter) HVDC system is the key technology for long distance bulk power transmission. However, the LCC HVDC has two serious shortcomings (a) not being able to control its reactive power and terminal AC voltages; and (b) vulnerable to commutation failures. This presentation will discuss the recent developments in LCC HVDC and how in the concept of Flexible LCC HVDC we can transform the technology to Flexible LCC HVDC with controllable capacitors. The Flexible LCC HVDC will be able to provide fast dynamic reactive power support for the AC systems and eliminate completely the commutation failures. The Flexible LCC HVDC system with controllable capacitors will have the system's ability of operating under negative extinction angle so as to achieve a wide range of reactive power control and, in particular, the ability of exporting reactive power to the AC grids. Some simulations on RTDS will be shown to demonstrate the effectiveness of the reactive power and voltage control, and commutation failure elimination method.

Biography of the Speaker:



Dr Zhang is currently Professor in Electrical Power Systems, Director of Smart Grid of Birmingham Energy Institute, Co-Director of Birmingham Energy Storage Centre at the University of Birmingham, UK. He is Guest Professor of Southeast University, Hohai University, and Shanghai University of Electric Power. He was an Alexander-von-Humboldt Fellow with the University of Dortmund, Germany from 1999 to 2000. He co-authored 5 books including the monograph "Flexible AC Transmission Systems: Modeling and Control" (New York: Springer, 2006 and 2012) and "Restructured

Electric Power Systems: Analysis of Electricity Markets with Equilibrium Models" (IEEE Press/Wiley in 2010). Prof Zhang is an IEEE PES Distinguished Lecturer on HVDC, FACTS and Wave Energy Generation. Professor Zhang is Chair of the IEEE WG on Test Systems for Economic Analysis. Prof Zhang is also Secretary of IFAC Technical Committee on Power and Energy Systems Control. He is co-founder of the UK-China Smart Grid Workshop Series.

Web Page <http://www.profxiaopingzhang.org/>

伯明翰大学张小平教授：

张小平担任伯明翰大学电子，电气与系统工程系教授。主要从事全球能源互联网，能源共同体，智能电网，电力系统规划与运行、传统高压直流输电/柔性直流输电/柔性交流输电系统的实时仿真、新能源的系统稳定性与控制、电力市场与需求侧管理等领域的研究工作。张小平教授担任伯明翰大学能源研究院智能电网学术总监，英国工程与物理科学研究理事会/伯明翰大学储能中心副主任，中国电机工程学会英国分会执行理事长，国际自控联电力与能源控制专委会秘书长。张小平教授担任上海电力学院，东南大学，河海大学客座教授。张小平教授是中英智能电网论坛的创始人。张小平教授出版学术专著 5 部。

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