Lingnan University 嶺南大學 香港 Hong Kong

LUIAS DISTINGUISHED LECTURE

Controls in Power Systems with High Renewable Presentation

15 Nov 2024 (Friday)

4:30pm-5:30pm
(Registration at 4:15pm)

MBG07, Lee Ying Lam Lecture Theatre, Patrick Lee Wan Keung Academic Building

Scan to Register

Speaker

Professor Joe H. Chow

Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic Institute

ALL ARE WELCOME

Joe Chow is Institute Professor Emeritus and Senior Research Scientist, Electrical, Computer, and Systems Engineering at Rensselaer Polytechnic Institute, Troy, New York. He received his MS and PhD degrees from the University of Illinois, Urbana-Champaign. He is a fellow of IEEE and a member of the US National Academy of Engineering. His research interests include power system dynamics and control, synchronized phasor measurements, and integration of renewable resources. He has received several awards, including the Donald Eckman Award from the American Automatic Control Council, the Control Technology Award from the IEEE Control Systems Society, the Charles Concordia Power Engineering Award from the IEEE Power and Energy Society, and the IEEE Herman Halperin Electric Transmission and Distribution Award. He is the author and co-author of several books, including a recent Wiley textbook, entitled "Power System Modeling, Computation, and Control" and the upcoming book "Power System Oscillations - second edition."

Abstract

This presentation will discuss converter control when power systems are operating with high (over 50%) converter-based renewable generation. Traditional synchronous generator controls are set to handle transient, voltage, damping, and frequency stability issues arising from contingencies. With the anticipated retirement of many steam units and increased replacement by renewable resources and storage systems, the total system inertia and synchronizing torque will be decreased, affecting power system stability properties and increasing the likelihood of cascading blackouts. The focus of this talk is to discuss various issues and approaches to enable a smooth transition from fully synchronous generation to a high percentage of renewable resources with inverter interfaces. The topics covered include frequency and voltage regulation, grid-forming and grid-following converters, inertia estimation, transient stability enhancement, and oscillation detection. The presentation is aimed at addressing an audience with interest in energy systems and feedback controls.

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This lecture is sponsored by the Lingnan University Institute for Advanced Study and co-organised by the School of Data Science .

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