

Lecture by

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Renewable Integrated Power System Stability and Control: Frequency Point of View

Increased needs for electrical energy as well as environmental concerns besides growing attempts to reduce dependency on fossil fuel resources have caused power system industries to set an ambitious target of renewable generation. Therefore, the capacity of installed inverter-based distributed generators (DGs) and renewable energy sources (RESs), individually or through the microgrids (MGs), in power systems is rapidly growing; and this increases the significance of *renewable integrated power system stability and control* as a challenging issue. It is well known that low penetration of MGs/DGs has little influence on host grid stability and dynamics and thus the associated dynamics could be studied through simple power flow analysis. However, modern power grids face new technical challenges arising from the increasing penetration of power-electronic-connected MGs/DGs. Increasing renewable power penetration level may adversely affect frequency response and voltage and system control, and lead to degraded performance of traditional control schemes. This, in turn, may result in large deviations and, potentially, system instability. This presentation deals with frequency stability assessment of inverter-based integrated power systems. Details of the talk could be found in the recently published book “Renewable Integrated Power System Stability and Control” by Wiley-IEEE.



Hêmin Golpîra received the B.Sc., M.Sc., and Ph.D. degrees in Electrical Engineering in 2007, 2009, and 2015, respectively, all with honors. During 2014 and 2015 Hêmin was with the University of Wisconsin-Madison and Wisconsin Energy Institute, USA, as associate research fellow. In 2016, Hêmin joined the University of Kurdistan, Sanandaj, Iran, as assistant professor where he is currently associate professor. During 2019 and 2021 Hêmin was visiting professor with Ecole Centrale de Lille, France. Hêmin did five national industrial projects and received four national and international awards. He published more than 40 technical journals and conference proceedings especially in the field of low inertia power system stability and control. He is the author of the book “Renewable Integrated Power System Stability and Control” 2021, Wiley-IEEE. Hêmin research interests include low inertia power system stability and control, power system modeling and simulation, and wide area monitoring and control. For more details visit:

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