



Power Systems Engineering Research Center

Effects of Ancillary Service Markets on Frequency and Voltage Control Performance of Deregulated Power Systems

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2:00-3:00 p.m. Eastern Time (11:00-12:00 p.m. Pacific)

This tele-seminar is based on PSERC Project M-13.
([Executive Summary](#) | [Report](#))

Description:

In this presentation, research results from project “Agent Modeling for Integrated Power Systems” (final report published in September 2008). In that research, we showed that different ancillary service market designs for frequency and voltage control have different effects on corresponding control performance of power systems.

In the research, we created different market structures for the balancing (regulation) market and the voltage/VAr market and study their effects on frequency control performance and voltage control performance, respectively, of a power system. As the automatic generation control (AGC) to control frequency is quite standardized we did not change the control but only the market structure. For voltage/VAr control the secondary control methods are still evolving and there are few markets in operation, so we tried new control methods as well as market structures.

For frequency control, we conducted comparative studies to examine how changing the market structure can achieve a more desirable performance, mainly by incorporating generator response rates into the market design. For secondary voltage control, we studied the feasibility of competitive markets for generator VARs and found that it is difficult to avoid locational advantage (i.e. market power) for certain generators.

Biography: Anjan Bose is a Regents Professor and the Distinguished Professor of Power Engineering at Washington State University. He has over 35 years of experience in the power industry and academe. His pioneering work in developing and

implementing real time analysis software for power grid control centers was cited in his election to Fellow of the Institute of Electrical & Electronics Engineers (IEEE). His work in the development of real time simulators, which are used around the world for training grid operators, was cited in his election to the National Academy of Engineering. He was also recognized by the IEEE with their Outstanding Power Engineering Educator Award, the Third Millennium Medal and the Herman Halperin Electric Transmission & Distribution Award. He has consulted on power system operation for numerous companies and governments all over the world.

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Registration for Webcast Participation: None required. There is no charge for participating!

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Shmuel welcomes feedback on the tele-seminars and suggestions for future ones.