



Fall 2018 Distinguished Seminar Series

Managing Uncertainties in the Future Grid

Evolution of EMS Control Centers – PMU Synchrophasor Solutions

“Keeping the Lights On! Yesterday, Today & Tomorrow!”

TUESDAY October 23, 2018

10:00 AM – HEC 101A

Managing the future grid will require creative, innovative solutions. Uncertainties in the grid are increasing due to the growth of less predictable renewable generation resources, demand response programs, distributed generation, microgrids, potential cyber-security issues, the retiring workforce and the aging infrastructure. Energy Management Systems (EMS) have been deployed for decades at utility control centers to manage the electricity grid in real-time. Today these EMS capabilities are poised to be enhanced quite dramatically with growth of synchrophasor PMU measurements. Solutions to decentralize management of the grid are also being introduced – these include Distribution Management Systems, Substation Automation and advances in grid control devices. These new solutions will help us monitor, manage and automatically control uncertainties and challenges of the future smart grid. Topics include:

- The history and evolution of the EMS from its digital genesis in the 1970's.
- The primary functions of a modern EMS
- Emerging new industry drivers & emerging new technology trends
- Impact of growth of microgrids, renewables and distributed generation on the EMS
- Growth of Phasor Measurement Units (PMUs) and synchrophasor measurements worldwide
- Wide area monitoring (WAMS) and wide area control (WAMPAC) solutions
- Modern advanced fast-acting grid control devices
- Concluding thoughts on the challenges and opportunities to manage the future grid.



Jay Giri

Independent Consultant GGM Consulting

Jay Giri is a former Director of Power Systems Technology and Strategic Initiatives at GE Grid Software Solutions in Redmond, Washington where he managed a team of power system engineers who delivered generation control, market applications and synchrophasor/phasor measurement unit (PMU) applications to utility control centers. He is an independent part-time consultant today. He is also an affiliate faculty at the University of Washington. He retired from GE in 2017.

In 1978, Jay and 11 other engineers co-founded Energy System Computer Applications (ESCA) in Bellevue, WA. Over time, ESCA became Alstom Grid in 2010 and GE Grid Solutions in 2015.

Jay designed and implemented the original software for the ESCA automatic generation control (AGC) and dispatcher training simulator (DTS) power system simulation functions. Today this AGC controls over 50% of North American generation as well as generation in many other countries, and the DTS is one of the predominant simulators used by control centers worldwide.

B.Tech - Indian Institute of Technology (IIT), Madras (Siemens gold medalist). PhD – Clarkson University, Potsdam, NY. IEEE Fellow 2002: “for contributions to the design and implementation of power system control centers.” Member of the IEEE Power & Energy Society (PES) Governing Board 2011-2016 – Member at Large for Industry Outreach. Alstom Grid Senior Fellow 2012. Member of the Washington State Academy of Sciences 2015. Member of the US National Academy of Engineering (NAE) 2017: “for contributions to utility control center technologies to enhance grid situational awareness and reliability.”

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