Abstract: Changes taking place in one of the largest and most complex cyber-physical systems out there, the Electric Power Grid are posing interesting challenges. Legacy systems utilizing ancient technology are coupled with cutting-edge implementations for the new smart grid. Smart Metering, Smart Sensors like Phasor Measurement Units, Pluggable Hybrids, Renewable Energy Resources, and increasing interaction between the consumers and the suppliers of the electricity are examples of the evolutions that are posing challenges. With the world rapidly progressing towards a smarter grid, those challenges must be overcome and done so in a manner that provides confidence in their deployment. This talk will examine some of the above challenges in this space and how effective solutions that address those challenges are being designed and evaluated through a testbed as part of the DOE/DHS sponsored Trustworthy Cyber Infrastructure for the Power Grid (TCIPG) Center. Material covered will include setting up the testbed, various hardware and software utilized, unique issues presented, experiences, and lessons learned. The talk will conclude by providing some open issues and suggestions for future direction of research.

Biography: Tim Yardley is a Technical Program Manager and Senior Researcher at the Information Trust Institute at the University of Illinois Urbana-Champaign. In his research, he addresses analyzing and developing techniques for securing scalable complex systems and networks. His current projects cover a variety of areas, including national critical infrastructure, control systems, telecommunications systems, critical incident response, and simulations of real-world systems. He also architects and operates a number of testbeds including an extensive power system testbed under TCIPG. Mr. Yardley has been heavily involved with security for many years and has worked in areas covering everything from embedded systems and trusted operating systems to cryptography and human computer interaction. Coming back to Academia from Industry, Mr. Yardley offers a unique perspective on problems from the field and innovative solutions to addressing those problems in a deployable manner.