

Spring 2016 Seminar Series

A LAYERED SOLUTION TO CYBERSECURITY

FRIDAY FEBRUARY 12, 2016

10:00 AM – HEC 450

The rapid increase in distributed generation in the United States has elevated the importance of cybersecurity in the electric sector. This is because distributed generation sources are often located in unmanned facilities with limited or no physical security. Hackers can have unfettered physical access to these resources and could potentially launch cyber-attacks by either tampering with the intelligent systems on the distributed generation sources or attaching a peripheral device laden with sophisticated malware to disrupt operations. The traditional cybersecurity controls such as firewalls, access control lists, encryption, authentication and authorization do very little to block such attacks. This is because the hacker becomes an “insider threat” when he/she physically accesses the distributed generation source and launches attacks from a trusted node in the power network. A systemic view of cybersecurity is needed in this situation to identify anomalous behavior and block it before it can disrupt operations. This presentation will offer an empirically validated 9-layer security architecture for power systems developed at NREL that has the potential to mitigate the risk from physically and logically compromised distributed generation sources on the electric grid.

DR. ERFAN IBRAHIM

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Dr. Erfan Ibrahim is the Center Director for Cyber-Physical Systems Security & Resilience R&D at the National Renewable Energy Lab in Golden Colorado. Dr. Ibrahim works with the public and private sector to identify security requirements, evaluate cybersecurity standards, test cybersecurity controls and determine residual risk in smart networks in the electric sector, water and oil & gas. He serves as the chief liaison from NREL to the Office of Electricity Delivery and Energy Reliability (OE) at the Department of Energy. He is also serving on the cybersecurity and resilience team within the Grid Modernization Lab Consortium for the DoE.

Dr. Ibrahim has had a 28 year career working in a variety of fields including plasma physics, nuclear fusion engineering, telecom, IT, network management, communications, smart grid and cybersecurity. He has worked for Lawrence Livermore National Lab, UCLA, Pacific Bell, Newbridge Networks, Jyra Research, Electric Power Research Institute, Scitor and Penn State University. He served as a consultant through his company, The Bit Bazaar LLC for over 10 years in the high tech, financial services, government and energy sectors. Dr. Ibrahim led the industry consensus building exercise in the NIST Smart Grid Interoperability Roadmap project during 2009 and also led the National Electric Sector Cybersecurity Organization Resources (NESCOR) project from DoE during 2010-2011 while serving as a Technical Executive in the Intelligrid Program at EPRI.

Dr. Ibrahim has a BS Honors in Physics from Syracuse University, an MS in Mechanical Engineering from University of Texas Austin and a PhD in Nuclear Engineering from the University of California Berkeley.

Hosted by: Dr. Gary T. Leavens

