

The INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, Inc.
Eastern Idaho Section
Idaho Falls Informal Seminars

TOPIC: ICIS/IEEE/ISA “Brew with the Crew” presents: Tuning Your Wireless to Tune Out Your Neighbors... Transmitters
SPEAKER: John Buttles, Idaho National Laboratory
DATE: Thursday, November 17, 2011
TIME: 4:30P.M.
PLACE: The Zone, 1505 West Broadway, Idaho Falls, Idaho
COST: Light hors d'oeuvres provided by the organizers. Order other items at your expense.

Abstract:

Wireless sensor networks (WSN) are becoming an integral component in modern industry. Their implementation range from factories, electric plants and distribution, municipal water and sewer facilities, natural gas storage and distribution facilities and even nuclear facilities. These devices aid in measuring and managing the operation of these services and in process control for manufacturing facilities to improving the overall efficiency and safety. As an integral component they are an important element in designing a resilient control system. Resilient design considers the reliability of WSN in control systems that provide the pathway for both sensory inputs and the active control responses when making decisions and transmitting a control command.

The reliability of these systems depend on understanding the effect of radio frequency (RF) and/or cyber interference to wireless sensors which can lead to a control system failure. My research investigates the effects of radio frequency (RF) and/or cyber interference to a Wireless Sensor Network (WSN) and how it will lead to destabilization of a control system by introducing latency or modifying data. Utilizing the CAES facility, I have established a Wireless Sensor Test bed at CAES for research to advance the cyber security and operation of wireless sensor in critical infrastructure facilities. The CAES facility was selected due to its combined industrial and office like environment that best resembles a real world installation. This will provide a comprehensive look at the weaknesses and vulnerabilities within WSN designs and investigate the effects of multiple interference types on WSN.

Future research will involve resources from ISU and U of I to create realist computer models of WSN behavior to predict their operation in a production facility surrounded by many interfering signals. The developed approaches and solutions will be used to resolve system degradation and failures resulting in improved reliability of WSN and will also be used by vendors to improve their next generation designs.

IEEE members make plans to join your colleagues for the November informal technical seminar series event “Brew with the Crew*” organized by the INL’s Instrumentation, Controls and Intelligent Systems (ICIS) Distinctive Signature, the Eastern Idaho Section of the Institute for Electrical and Electronics Engineers (IEEE) and the Idaho Falls branch of the International Society of Automation (ISA).

Biography:

John Buttles P.E. BSEE, MSEE, P.E. (UT, ID and CA), over 15 years successful experience with major emphasis on telecommunication and control system design for cellular phone, microwave radio, WiMax, 802.xx, fiber, process control, wireless sensor networks and SCADA networks. Responsibilities consisted of system planning, instrumentation and sensor configuration, infrastructure design, start up, testing and final acceptance. Projects include oil refineries, power plants, natural gas gathering and transportation pipelines, waste and potable water systems, state wide cellular networks and cyber security evaluations of control systems. Established a Wireless Sensor Test bed at INL for research to advance the cyber security and operation of wireless sensor in critical infrastructure facilities. I have an FCC Amateur Radio Extra Class radio-communications license (N7WZ). I also have two patents pending.

The Bulletin:

See other section news and information at <http://www.easternidahoieee.org/news.htm>

*Brew with the Crew is an after work event, that takes place every third Thursday of the month at The Zone to provide an opportunity for instrumentation, control and intelligent systems researchers and practitioners to interact with others in their community.

***** VISITORS AND NON-MEMBERS ARE WELCOME *****
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