

IEEE STD. 1815 (DNP3) TUTORIAL

Date: May 17, 2015 - Sunday 8:00 am – 5:30 pm

Event: IEEE Substations Committee Annual Meeting

Location: Renaissance Minneapolis Hotel, 225 South 3rd Avenue, Minneapolis, MN

Presenters: Ron Farquharson and Craig Preuss

Abstract:

IEEE 1815 (DNP3) continues to be implemented by a majority of North America electric utilities for T&D automation and SCADA/EMS/DMS applications. The DNP User Group is active in supporting the protocol by providing: the continuous engagement of the DNP Technical Committee, technical expertise for industry panels, webinars and courses; updates and refinements to the IEEE 1815 standard; test procedures for independent verification; security enhancements; guidance for implementers; application notes for users and implementers; and technical bulletins for implementers. The User Group also maintains a comprehensive website with wide range of resources for its members. This tutorial is partly sponsored by the DNP User Group.

This tutorial covers IEEE 1815 (DNP3) and IEEE P1815.1 (DNP3 ↔ IEC 61850) with emphasis on the following topics:

- DNP3 Overview and History
- Basic Implementation - Important DNP3 Settings
- DNP3 Deployment Issues and Lessons Learned
- Using the Device Profile document
- General Interoperability Requirements
- Testing Considerations
- Specifying Equipment for DNP3
- Advanced DNP3 Features
- Practical Cyber Security for DNP3
- Secure Authentication tutorial
- Results of the Secure Authentication Demonstration Project with EPRI
- New DNP Profiles
- Mapping to IEC 61850
- Recent enhancements and DNP Technical Committee Activities
- Case Studies for SA and DA

Presenter Bios:

Ron Farquharson is a Principal Consultant and utility automation professional with expertise in a number of areas of electric utility transmission and distribution automation including data communications, substation gateways, synchrophasor data measurement, equipment condition monitoring and standards. He has assisted utilities with program reviews, requirement developments and procurement documentation. In recent years Ron has also been assisting

utilities with their technology investment and deployment planning. As part of these engagements, he has developed an effective methodology for roadmap development that includes technology assessments, standards maturity, gap analysis, regulatory compliance and risk assessments. A key part of the methodology is a highly collaborative approach based on use-cases to identify multi-stakeholder requirements.

Ron is the President of the DNP User Group, is a Senior Member of the IEEE, Chair of two PES working groups related to IEEE Std. 1815 (DNP3) and IEC 61850 and a member of Cigre. He also serves on the Advisory Committee for DistribuTECH as the Substation Automation Track Chair. Prior to his work as a Principal Consultant Ron spent 25 years with GE serving in a range of roles primarily related to Product Management and Product Leadership in the area of Substation Automation.

Craig Preuss is an Engineering Manager at Black & Veatch. He has expertise in substation automation at the transmission and distribution levels. He assists utilities with all aspects of substation automation system engineering, procurement and construction. This includes conceptual design; cost justification; technology assessments; equipment specification, procurement and selection; system architecture for substation networks of all kinds; cyber security; detailed design including logic, drawing development, and programming; testing; and commissioning.

Craig is the Chair of the IEEE PES Substations C0 Subcommittee, which is responsible for developing IEEE standards related to substation automation. As subcommittee chair, DNP3 became an IEEE standard and many standards have been updated, new standards created, and even newer standards are under development. The C0 subcommittee now has 16 active working groups working on 17 different standards related to substation automation. More standards are planned and volunteers are warmly accepted at any level of experience. Craig is also the working group chair responsible for IEEE C37.1, "the SCADA standard".