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EDUCATION AND TRAINING

- University of Tennessee, Chattanooga, TN Electrical Engineering - Power B.S., 2001
- Chattanooga State, Chattanooga, TN Electrical Engineering Technology A.A.S., 1991

RESEARCH AND PROFESSIONAL EXPERIENCE:

Oak Ridge National Laboratory Research Staff, 2008-present

Perform research related to advanced grid modeling, microgrids, and power system protection. Supporting research and development objectives with in-depth analysis of system performance, power quality, and protection strategies in an effort to improve technology, define best practices, and generate actionable insights with real-world applications. Combines advancements in mathematics and computer based modeling to study the qualitative and quantitative impacts of unified computer/physical systems, centralized wide area control, and protection and control schemes.

EnerNex Corporation Senior Engineering Consultant, 2006-2008

Coordinated studies related to harmonics, transients, and protection analysis for general power systems. Analyzed capacitor banks to determine harmonics, inrush, protective relaying, and back-to-back sing transients with coordination for plants and utility owned transmission or distribution systems. Provided analysis of harmonics for an automatic traction system as a harmonic source and generated comprehensive power quality analysis pertaining to the IEEE-519 steady-state limitation standards. Mitigated problematic harmonics, reactive power, transients, and flicker issues by effectively managing power quality monitoring projects within both simple and complex systems

Georgia Power Company Senior Electrical Engineer, 2001-2006

Designed relay and control systems for transmission/distribution lines, substations, generating plants, and switchyards. Developed microprocessor based protection control schemes associated with capacitor banks, which became Southern Company standards and were subsequently rolled out to 5 power subsidiaries. Created several new innovative designs by replacing existing electromechanical schemes with equivalent and improved microprocessor-based relays. Verified documentation within design systems by coordinating protective relaying and control scheme studies. Managed and monitored project work plans and scheduled activities to optimize relay setting data and avoid negative impacts to project workflow. Reviewed transmission system operations, compared findings with system models, and revised protective relaying/control schemes in support of Georgia Power TE&C group and integrated partners

Tennessee Valley Authority Senior Electrical Engineer – Protection & Control, 2001

Provided engineering design and support through protective relaying and automatic fault sectionalizing for several complex systems. Provided extensive design support for substations and generated highly accurate calculations to improve quality and safety across switching, protection, and control systems. Assisted with the continuous development of design standards and conversions to new microprocessor based relaying schemes including: POTT/PUTT (Permissive over/under reach transfer trip schemes), multi-shot reclosing logic, distance relaying applications, step distance and pilot carrier configurations

for back-up protection of the TVA power system. Developed design standards for all TVA PLC (programmable logic controller) controlled automatic fault sectionalizing schemes.

Tennessee Valley Authority

Electrical Engineering Associate, 1993-2001

Worked with lead engineers to design and support new and existing installations of protective relaying, automatic fault sectionalizing schemes using substation automation, data acquisition systems, and high speed data communications networks for TVA and customer substation facilities. Evaluated analog and digital communications options, considering cost and coverage areas, including TVA SONET based optical fiber, microwave, radio systems, distributor trunk lines, and cellular technologies to provide a cost effective and reliable communications link to TVA Power Business, Power Billing, and Load Control Centers

Tennessee Valley Authority

Instrument Mechanic- Sequoyah Nuclear Plant, 1991-1993

Performed routine and scheduled outage maintenance on electrical, pneumatic, hydraulic, instrumentation, and control systems at various TVA Fossil, Hydro, and Nuclear Power Generation Plants. Performed diagnostic checks, testing, calibration, and modifications to individual system components, input-output transducers, input selector matrices, signal conditioners and documented analysis, test data, and engineering drawing (E&I and P&ID) modifications.

SELECTED PUBLICATIONS:

- “Advanced Feeder Design for Distributed Generation”, McDermott, T.E., Muschlitz, B.A. Goodman, Smith, T.M., Power Engineering Society General Meeting, 2007. IEEE, ISSN: 1932-5517, ISBN: 1-4244-1296-X, 10.1109/PES.2007.386168
- “Wind Plant Collector System Fault Protection and Coordination”, Smith, T.M., E.H. Camm, M. R. Behnke, Bloethe, W.G., M. Bradt, C. Brooks, W. Dilling, Goltz, B., Li, J., Niemira, J., Nuckles, K., Patifio, J., Reza, M., Richardson, B., Samaan, N., Schoene, J., Snyder, I., Starke, M., Walling, R., Zahalka, G., T&D PES Wind Plant Collector System Design Working Group, Power & Energy Society, August 2009.
- “Behavior of doubly-fed induction generator under nearby wind plant fault”, Smith, T.M., Aluko, O. Tolbert, L.M., “Behavior of doubly-fed induction generator under nearby wind plant fault”, IEEE PES Power & Energy Society General Meeting, July 2010.
- “Calculation of fault current contribution of Type I wind turbine-generators”, Smith, T.M., Howard, D.F., Harley, R.G., Restrepo, J., Dang, J., Starke, M., T&D PES Power and Energy Society General Meeting, May 2011.
- “Short circuit analysis of induction machines - wind power application”, Smith, T.M., Howard, D.F., Harley, R.G., Starke, M., T&D PES Conference and Exposition, May 2012.

SYNERGISTIC ACTIVITIES:

- Senior Member, IEEE PES, (#01325059), 1989 – Present
- Vice Chair - IEEE PES Transmission and Distribution Committee, Integration of Renewable Energy into the Transmission and Distribution Grids Subcommittee, 2010 – 2016
- Active Registered Professional Engineer in the states of TN, UT, HI, NJ, and NC.
- *NCEES Record Holder for National Licensure in multiple Jurisdictions (#32832), 2007 – Present*
- *NCEES Electrical & Computer PE Exam Committee – Power Exam Development, 2007 – Present*