

HV Shunt Reactor Intelligence Protection Scheme- How It Makes Grid Smarter

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BC Hydro, Transmission Engineering
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Abstract:

From the first installation to the present, shunt reactors have formed an important component of the AC power transmission system and is used to compensate for the capacitive reactance of transmission lines and cables. This capacitance produces VAR result in high voltages. So, the main task of shunt compensation is voltage regulation.

This presentation will focus on the protection planning aspects of these installations, and the role protection takes in assuring the specified performance of these important elements in the power system. With new intelligent devices and telecommunication media (digital microwave and fibre optic cables), the protective schemes for the shunt reactors make the power system more reliable and costly effective.

Meliha B. Selak is a Specialist Engineer in Electrical Power Systems with BC Hydro. She has an Electrical Engineering degree from the University of Sarajevo and has over 30 years of experience in various aspects of power systems engineering including utility protection, research & development, project management and consulting on international projects. Prior to joining BC Hydro in 2000, she worked as a research engineer in the Power System Group at the University of British Columbia on Real-Time Power System Simulator in connection with EMTP. Her technical activities include power system protection and control applications, power system analysis, evaluations and interconnection studies for the various plants connecting to the power system, as well as development of the protection guidelines.

She is a registered professional engineer in the Province of British Columbia and is a senior member of IEEE. In 2009 she is serving as the vice president for Chapters for the IEEE Power & Energy Society and a member of its governing board. Also, she is a member of the IEEE Power System Relay Committee (PSRC). She has written numerous documents and technical papers associated on the power system subjects and also a paper reviewer.

About The IEEE and the IEEE/PES

The IEEE (the Institute of Electrical and Electronics Engineers), is the world's leading professional association for the advancement of technology. With 375,000 members in more than 160 countries, IEEE is a leading authority on areas ranging from electric power, aerospace systems, computers and telecommunications to biomedical engineering, and consumer electronics among others. The IEEE also serves student members in colleges and universities around the world. Read more at <http://www.ieee.org/>.

The IEEE Power & Energy Society (IEEE/PES) is a worldwide, non-profit association of more than 24,000 individuals engaged in the electric power energy industry. Its scope embraces planning, research, development, design, application, construction, installation and operation of apparatus, equipment, structures, materials and systems for the safe, reliable and economic generation, transmission, distribution, conversion, measurement and control of electric energy. Read more at <http://www.ieee-pes.org/>.

The Program

This unique tutorial series is part of a major event to be hosted by the Electrical Engineering Department at The Petroleum Institute in Abu Dhabi, in conjunction with the celebration of the 125th Anniversary of the IEEE/PES and the Fall 2009 meeting of the IEEE/PES International Executive Committee. The tutorials will be given by top international Power Engineering Experts which include the President and Vice-Presidents of the IEEE/PES. It is for the first time that the IEEE/PES holds its meeting in this region outside of North America. In addition to the members of the IEEE/PES Executive Committee, the meeting will involve the Chairs of the IEEE/PES Chapters in the Middle East and North Africa. Join us at the PI in celebrating 125 years of success and innovation by IEEE/PES members by attending the tutorials.

Event Details

Wednesday, October 28, 2009 from 8am to 5pm
The Petroleum Institute, Abu Dhabi. U.A.E.

Tutorial 1 | 08.00 - 09.30

«What is the Smart Grid and What is Needed to Make it a Reality»

Saifur Rahman - Vice President IEEE/PES

Tutorial 2 | 09.40 - 11.10

«Recent Trends in Substation Automation and Enterprise Data Management to Support Smart Grid Applications»

John Mc Donald - IEEE Division VII Director, Past President IEEE/PES

Tutorial 3 | 11.20 - 12.50

«HV Shunt Reactor Intelligence Protection Scheme- How It Makes Grid Smarter»

Meliha B. Selak - Vice President IEEE/PES

12.50 - 13.40 Prayer & Lunch Break

Tutorial 4 | 13.40 - 15.10

«Practical Lessons from Wind Farm Collector Systems and Interconnections»

Wanda Reder - President IEEE/PES

Tutorial 5 | 15.20 - 16.50

«Intelligent System Strategies for Reconfiguration of Power Systems including Distributed Generation and Intentional Islanding»

Noel N. Schulz - Treasurer, President-Elect Candidate for 2010-11, IEEE/PES

Registration Fees * **

Institutional Rate:	\$ 1500 (5 delegates, including all tutorials)
Non IEEE Members:	\$ 50 per tutorial
IEEE Members:	\$ 30 per tutorial
IEEE Student Members:	\$ 20 per tutorial

* Funds will be used to support the activities of the IEEE/PES UAE Chapter

** Deadline to register is October 15, 2009 (limited seats are available)

Information

For more information contact the Organizing Committee:

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Hosted by the Electrical Engineering Department

Wednesday, October 28, 2009



1884 - 2009



The Wind Market and Practical Lessons Related to Plant Collector Systems and Interconnections

Wanda Reder (President IEEE/PES)
Vice President Power Systems Services
S&C Electric Company
Chicago, IL, USA



Abstract:

Wanda Reder, VP of Power Systems Services at S&C Electric Company and President of IEEE PES will be presenting "The Wind Market and Practical Lessons Related to Plant Collector Systems and Interconnections". This presentation will cover the wind energy development in the United States, review the turbine and tower, discuss the engineering requirements for the collector system and also highlight the modeling requirements for interconnections. She will conclude with some discussion on the typical structure for wind projects and lessons learned after completing them.

Wanda Reder, is currently the President of the IEEE Power & Energy Society and the Vice President of the Power Systems Services Division at S&C Electric Company offering engineering, field service, and project management capabilities to utilities, developers and industrial customers. Prior to S&C, Wanda was the Vice President of T&D Asset Management at Exelon where she had responsibility for asset investment strategy, standards, engineering, planning, reliability and work management in Chicago and Philadelphia. Prior to Exelon, Wanda was the Vice President of Energy at Davies Consulting.

Wanda has been instrumental in leading S&C into the Wind energy market. She capitalized on S&C's expertise in contract development, substation and collector engineering and design, relaying, protection and coordination, SCADA, VAR management, and S&C's world class consulting and analytical services. Under Wanda's leadership, S&C now consults with the largest wind developers in the world; S&C has constructed the largest wind farm in Canada, and several wind generation facilities in the U.S.

Recent Trends in Substation Automation and Enterprise Data Management to Support Smart Grid Applications

John D. McDonald, P.E. (IEEE Division VII Director,
Past President IEEE/PES)
General Manager, Marketing
General Electric (GE) Energy T&D, USA



Abstract:

The purpose of this talk is to familiarize participants with all aspects of substation automation and enterprise data management, and how they support Smart Grid applications. The term Intelligent Electronic Device (IED) is defined. The different levels of substation integration and automation are discussed. The reasons a utility would need substation automation are presented. The components of the integration and automation architecture are discussed with respect to their technical issues. This discussion flushes out the sensitive, controversial issues that need to be addressed by a utility when implementing substation automation. The characteristics and interface issues associated with Intelligent Electronic Devices (IEDs) is addressed, since the integration architecture is only as good as the

integration capabilities of the IEDs themselves. Communication protocol fundamentals and considerations are discussed. Relevant industry standards and their impact on substation automation are described. The characteristics of extracting the valuable data from substation Intelligent Electronic Devices (IEDs) and effectively managing this data in the electric utility enterprise is illustrated.

John D. McDonald, P.E., is GM, Marketing for GE Energy T&D in Atlanta, Georgia. John has 35 years of experience in the electric utility transmission and distribution industry. John received his B.S.E.E. and M.S.E.E. (Power Engineering) degrees from Purdue University, and an M.B.A. (Finance) degree from the University of California-Berkeley. John is a member of Eta Kappa Nu (Electrical Engineering Honorary) and Tau Beta Pi (Engineering Honorary), is a Fellow of IEEE, and was awarded the IEEE Millennium Medal in 2000, the IEEE Power & Energy Society (PES) Excellence in Power Distribution Engineering Award in 2002, the IEEE PES Substations Committee Distinguished Service Award in 2003, and the 2009 Outstanding Electrical and Computer Engineer Award from Purdue University. John is Past President of the IEEE PES, CIGRE US National Committee (USNC) VP Technical Activities, Past Chair of the IEEE PES Substations Committee, IEEE Division VII Director, and is a registered Professional Engineer (Electrical) in California, Pennsylvania and Georgia. John teaches a course on Modern Energy Management Systems at the Georgia Institute of Technology, a course on Smart Grid for GE Energy, and has published thirty-one articles and papers and co-authored three books, including Electric Power Substations Engineering, Second Edition, published by Taylor & Francis/CRC Press in 2007. John is a member of DOE's Smart Grid Electricity Advisory Committee (EAC), a member of NEMA's Smart Grid Task Force, and on the Board of Directors of the GridWise Alliance.

What is the Smart Grid and What is Needed to Make it a Reality

Saifur Rahman, PhD (Vice President IEEE/PES)
Joseph R. Loring Professor & Director
Virginia Tech Advanced Research Institute
Arlington, USA



Abstract:

The concept of the Smart Grid originated from the desire to make the grid - starting from the power station to the end-use device - smarter, safer, and more reliable using advanced sensors, communication technologies and distributed computing. A smart grid will look more like the Internet, where information about the state of the grid can be exchanged quickly over large distances. It will also allow integration of new sustainable energy sources, such as wind, solar, off-shore electricity, etc. There are four attributes of the Smart Grid that need to work interactively for this concept to be a reality. These are: Technology, Standards, Public Awareness and a Policy of Incentives.

At present there are efforts from vendors to develop technologies which will become building blocks of this grid. At the same time standards are being developed which will make technologies from different vendors interoperable so that many players will be able to participate giving customers a broad choice. But all of these will depend on whether the public will find value in participating in this opportunity. And this will depend on two things - awareness and incentives - which are interrelated. The public must be made aware of the benefits of participating, and at the same time there must be incentives for them. There must be policies

and regulations in place that will encourage participation by creating a differential pricing structure for the electricity CONSUMED.

Saifur Rahman is the director of the Advanced Research Institute at Virginia Tech where he is the Joseph Loring Professor of electrical and computer engineering. He also directs the Center for Energy and the Global Environment at the University. He is a Fellow of the IEEE and a member of the IEEE-USA Energy Policy Committee. Professor Rahman has served as a program director in engineering at the US National Science Foundation between 1996 and 1999. In 2009 he is serving as the vice president for New Initiatives and Outreach for the IEEE Power & Energy Society and a member of its governing board. In 2006 he served as the vice president of the IEEE Publications Board, and a member of the IEEE Board of Governors. Prior to that he served as the vice president for Publications and Education & Industry Relations for the IEEE Power & Energy Society for five years. He is a distinguished lecturer of IEEE and in that capacity he has spoken on renewable energy, electric power system planning, intelligent power grid, environment and critical infrastructure protection related topics in over 20 countries in Asia, Europe, Africa, Australia and North America. He has published over 300 papers in the areas of his technical interest. He is the inaugural editor-in-chief of the IEEE Transactions on Sustainable Energy.

Intelligent System Strategies for Reconfiguration of Power Systems Including Distributed Generation and Intentional Islanding

Noel N. Schulz, Ph. D (Treasurer, President-Elect
Candidate for 2010-11, IEEE/PES)
Paslay Professor of Electrical & Computer Engineering,
Kansas State University,
Kansas, USA



Abstract:

With the increased penetration of distributed generation, there are more opportunities to reconfigure the power system to help with load leveling, restoration or improved stability. The talk will discuss research activities looking at various intelligent system techniques such as intelligent agents, genetic algorithms and particle swarm optimization to reconfigure the power system taking into account distributed generation as well as intentional islanding.

Dr. Noel Schulz is Paslay Professor of Electrical & Computer Engineering, Kansas State University, Kansas, USA. Dr. Schulz received her B.S.E.E. and M.S.E.E. degrees from Virginia Polytechnic Institute and State University (Virginia Tech) in Blacksburg, Virginia, USA in 1988 and 1990, respectively. She received her Ph.D. in EE from the University of Minnesota in Minneapolis, Minnesota, USA in 1995. Before joining K-State, She spent eight years at Mississippi State University where she was the TVA Endowed Professor in Power Systems Engineering. She also has teaching experience at Michigan Technological University, University of North Dakota and Virginia Tech. Her research interests are in the computer applications in power systems including power system operations, shipboard power systems and intelligent system applications. She is active in the IEEE Power & Energy Society serving as Secretary from 2004-2007, Treasurer from 2008-2009 and President-Elect candidate for 2010-2011. Dr. Schulz is a member of Eta Kappa Nu, Tau Beta Pi, the American Society for Engineering Education (ASEE), the Society of Women Engineers and the National Society of Black Engineers.