



IEEE Power Engineering Society – San Francisco Chapter presents:

Protection Basics for Power Engineers

Course Outline

Tuesday, May 22, 2007

7:30 – 8:00 AM	Registration and Refreshments	
8:00 – 8:15 AM	Welcome, Introductions, and Course Overview	Davis Erwin Course Coordinator
8:15 – 9:30 AM	Protection Basics and Regulatory Oversight Necessity of Protection, Security Vs Dependability, Basic Fault Calculation, Coordination and Overlapping Zones of Protection, Impact of Loading on Protection, CaISO role in System Reliability and Regulatory Compliance.	Lou Fonte CaISO
9:30 – 10:00 AM	Project Planning and Protection Considerations	Ed Taylor Pacific Gas & Electric Co.
10:00 – 10:15 AM	Break	
10:15 – 11:30 AM	Component Protection Protection Philosophies for Bus, Line, Generators, Transformers, Shunt Caps, etc.	Ed Taylor Pacific Gas & Electric Co.
11:30 – 12:00 PM	Lunch (provided)	
12:00 – 1:00 PM	Distribution Protection and DG Topics related to Distributed Generation (DG) and Distribution Protection	Dr. Mohammed Vaziri Pacific Gas & Electric Co.
1:00 – 1:15 PM	Break	
1:15 – 2:30 PM	System Integrity Protection Safety Nets, Remedial Action Schemes (RAS), Special Protection Schemes (SPS), Event Base Vs Response Based, WECC compliance	Vahid Madani Pacific Gas & Electric Co.
2:30 – 2:45 PM	Break	
2:45 – 3:45 PM	Synchrophasors Concepts of future use of Phasors in protection schemes, Review of Recent Blackouts – Summary and Findings	Dr. Damir Novosel InfraSource Technology
3:45 – 4:15 PM	Synchrophasors Measurements PG&E PMU Network, Communication Challenges, PMU Plots for system events, Protection Relay Vs PMU	Davis Erwin Pacific Gas & Electric Co
4:15 – 4:30 PM	Closing Remarks	

ABOUT OUR PRESENTERS

(Listed in alphabetical order)

Davis Erwin is a member of IEEE and has participated as a volunteer instructor for the IEEE San Francisco Section Professional Engineer Exam Review Course. He received his BSEE and MSEE in 1997 and 1998 respectively from New Mexico State University and is a registered professional engineer in California. He has over seven years experience as a PG&E system protection engineer where he primarily supported 500kV system projects and Special Protection Schemes. He is currently working in PG&E's Electric System Operations Department as a Senior Power System Engineer.

Lou Fonte is a senior protection engineer at the California Independent System Operator (CAISO). Lou has over thirty years experience in the electric utility field, including the protection of high voltage transmission facilities, fossil fueled power plants, and renewable energy facilities. Lou is a registered professional engineer in California and Vermont. Lou holds a BSEE degree from the Polytechnic Institute of NY, an MSEE degree from Purdue University, and an MBA from the University of San Diego.

Vahid Madani, Senior IEEE Member, is a Principal Protection Engineer at Pacific Gas and Electric Co. (PG&E). His responsibilities include 500kV transmission, reactive compensation, series capacitor protection and controls on EHV systems, single-phase protection and operation, transient and real time simulations, wide-area disturbance monitoring and prevention, protection and control equipment evaluation, substation integration and automation, and standardization.

Vahid is a registered Electrical Engineer with more than 24 years of academic and utility experience. He has been an industry lead in the development of many advance applications in power system protection and control. He is the recipient of many honorary and distinguished awards, for his leadership and technical contributions to the power system industry and education. Vahid is a Tau Beta Pi member and has a MS Degree in Power system from University of Idaho.

Mr. Madani has been a member of several investigative and restoration recovery task forces including the 1989 San Francisco and the 1994 Los Angeles Earthquakes, and the 1994 – 1996 Western Interconnection Disturbances.

Mr. Madani has various technical, advisory, and leadership roles within the North America and Internationally. He is the Chair of the Performance Standards for the North American Syncro Phasor Initiative (NASPI), Chair of the Remedial Action Scheme Reliability Subcommittee in the Western Electricity Coordinating Council (WECC) and recipient of the outstanding Chair Person award from WECC. Vahid is also Chair of the IEEE Working Group on the Global Industry Practices with System Integrity Protection Schemes (SIPS), Chair of the Power System Protection Testing, a member of CIGRE Study Committee (SC) B5 in Protection and Control Standards, and CIGRE SC C2 (Power System Operation).

Mr. Madani is an invited author, panelist and speaker in system automation, protection & controls applications, and practical wide-area monitoring systems with advance warning and fast restorations. He has over 60 refereed publications in professional journals and conferences. Amongst his publications are the IEEE Spectrum 2005, McGraw Hill 2006 Yearbook of Science and Technology, and is the Guest Editor of the 2007 Edition of International Journal of Reliability and Safety (IJRS) for InderScience Publishing, published in UK and Switzerland.

Damir Novosel, Fellow IEEE, is the President of InfraSource Technology. Prior to joining InfraSource in 2006, Damir held the position of the President and General Manager of KEMA T&D Consulting and has held various positions in ABB including Vice President of global product management for automation products and Manager of the power systems consulting group.

Dr. Novosel has 24 years of experience working with electric utilities and vendors. Damir is the member of IEEE PES Fellows Committee and is chairing Performance Requirement Task Team for the Eastern Interconnection Phasor Project (EIPP). He is past chairman of the IEEE PSRC Sub-Committee on System Protection.

Damir holds 16 US and international patents and has published over 80 publications in Refereed Journals and Conference Proceedings. He has contributed to a large number of IEEE and CIGRE tutorials, guides, standards, reports and other publications in the areas of power systems.

He has been invited to publish in IEEE Spectrum and contribute to McGraw-Hill Yearbook of Science and Technology on topics related to blackout prevention. Dr. Novosel was also responsible for a chapter on Fault Location for the IEEE publication “Advancements in Microprocessor Based Protection and Communications”. Dr. Novosel has developed and consulted on a number of concepts and methods to improve power system planning, operation and maintenance. He has been a keynote speaker and a panelist at a number of conferences and seminars on topics related to power systems.

Ed Taylor is a registered Electrical Engineer with more than 39 years of experience in System Protection in the utility business covering applications from distribution protection to 500kV EHV protection. He has a MSc EE degree in Power Engineering from Santa Clara State University. Ed is a member of the IEEE PES, the Western protective Relay Conference (WPRC) Planning Committee and a WECC Relaying Working Group member. Ed is one of the original members of the Pacific AC Intertie Remedial Action Scheme (PACI RAS) project at PG&E. Ed has contributed to many Guides in WECC protection applications.

Mohammed Vaziri, Senior IEEE Member received a BS EE in 1980, MS EE in 1990, and PhD EE in 2000 from the University of California, Berkley, California State University, Sacramento and Washington State University, Pullman respectively. He has 19 years of professional experience at Pacific Gas and Electric Company and the California Independent System Operator. He has over 14 years of academic experience teaching at CSU Sacramento, CSU San Francisco and WSU Pullman and has authored and presented technical papers and courses in the United States, Mexico and Europe. He is an active member and serves on several IEEE and other technical committees. Currently he is a Supervising Protection Engineer at PG&E and a part time instructor at CSU Sacramento and CSU San Francisco. Dr. Vaziri is a registered Professional Engineer in the state of California. His research interests are in the area of Power System Planning and Protection.