Oakland East Bay Industry Applications Society

Distributed Generation Interconnection Workshop

Date: Thursday, October 17, 2013

Time: 8:00AM- 5:00PM

Place: Hilton Pleasanton

7050 Johnson Drive

Pleasanton, CA 94588

Event Registration: http://ewh.ieee.org/r6/oeb/ias/workshop.html

EVENT PROGRAM

Session 1: *Overview of Wholesale Transmission & Distribution Electric Generation Interconnection Process*

Navigating the Interconnection Process can be both confusing and time consuming. This presentation will discuss the current utility requirements for electric generation interconnections to both the electric transmission and distributions systems. You will learn about the various Tariffs; Rule 21, Wholesale Distribution (WDT) and CAISO that govern each type of interconnection, CPUC and FERC Jurisdiction, Fast Track, Independent Study and Customer processes. Review of interconnection Project Case Studies and existing Resources and Tools available to help ensure the success of your interconnection project.

Speaker: Raymond Yazzolino, PMP – Senior Project Manager, PG&E

Raymond Yazzolino is a Sr. Project Manager with PG&E's Electric Generation Interconnection (EGI) Group. He has 28 years of service with PG&E and manages distribution interconnection projects under the Pacific Gas and Electric Wholesale Distribution Tariff (WDT), Attachment I Generator Interconnection Procedures. He is the main point of contact for merchant generator developers wanting to connect to the distribution grid, via 12 & 21 kV gen-ties to either the line (circuit) or directly to a substation. His responsibilities include coordinating studies identifying the adverse impacts (as a result of the generation) to PG&E's distribution system, These studies help determine the scope, costs, and work required to mitigate those impacts and ultimately interconnect the generation to the grid. Raymond negotiates the contracts and obtains the start-up funds in order to commence the design and eventually construction of those facilities identified in the studies, engaging Distribution & Transmission Planning, Substation Engineering, and System Protection for input. Raymond also facilitates coordination of work with Service Planning and Project Management to facilitate the job estimate and construction.

Speaker: Josh Glidden, PMP – Senior Technical Project Manager, PG&E

Josh Glidden is a Sr. Project Manager with PG&E's Electric Generation Interconnection (EGI) Group. Josh has 28 years of service with PG&E and is an Interconnection Tariff Subject Matter Expert, specifically complex NEM and Rule 21. His responsibilities include Tariff Interpretation and customer service resolution with core responsibility of managing the interconnection process for a wide variety of existing load customers. He has a B.A. in History from CSU Stanislaus and is a United States Navy Submarine Force Veteran.

Session 2: *CEC/CPUC Smart Inverters Initiative: Preparing for High Renewable Penetration.*

This presentation will cover the CEC/CPUC Smart Inverter initiative to prepare for high renewable penetrations. Germany is in the process of retrofitting 315,000 inverters over 10 kW, to avoid reliability impacts. The CEC/CPUC Smart Inverter Working Group is looking at changing CA Rule 21 requirements to make the inverters behave more like conventional units and minimize potential reliability impacts during system disturbances. In addition, the Working Group is exploring the implementation of enhanced inverter features, such as Volt/VAR and frequency support to improve system performance.

Speaker: Chase Sun, PE – Distributed Generation Principal Engineer, PG&E

Chase Sun received a B. S. in Electrical Engineering and Computer Science, Power Option, from UC Berkeley, where he learned about alternative energy and electric power systems. He is a licensed Electrical Engineer in California, since 1981.

Chase joined PG&E in 1977. Over the years, he has worked in distribution planning, switchyard engineering, alternative energy engineering, power plant engineering, station construction, project management, substation asset management, distribution protection, substation maintenance, and transmission planning. Chase developed

a balance of plant cost estimate and associated conceptual design for a 1.2 MW modular PV central station power plant in 1982, while he was working in the alternative energy engineering group. Chase also worked on the design changes for the 2.5 MW Solano Wind Turbine (Boeing Mod 2) before it was dismantled due to wind shear concerns in the late 1980's. Chase coordinated the drafting and issuance of the first complete set of PG&E generator interconnection requirements in 1984. He also designed the electrical system including the control logic for an R&D 150 kW Turbo-expander induction generator in the early 1990's. Chase was the electrical engineer on many generation projects. He was on the team that drafted and issued the PG&E Interconnection Handbook in 1997. He was on the IEEE-929, and Rule 21 working groups where the certification concept and streamlined review/approval process for the small inverters were developed over 10 years ago.

Chase is currently a Principal Engineer in Distribution Planning at PG&E, responsible for addressing system-wide DG issues, and representing PG&E, on the IEEE-1547.7, IEEE-1547.8, IEEE-1547a, California Rule 21, CEC/CPUC Smart Inverter working groups and the EPRI Renewable Integration Program.

Session 3: *Circulating Currents due to parallel operation of Transformers and Regulators*

Although parallel operation of distribution transformers or feeder voltage regulators is uncommon practice among the utilities, controlled and careful parallel operation does occur during testing or certain switching operations for short durations. This presentation will discuss and analyze a specific case where circulating currents from improper paralleling of voltage regulators caused unnecessary tripping of feeder relays and loss of distribution load.

Speaker: Mohammad Vaziri, Ph.D., PE – Assistant Professor, CSU Sacramento

Dr. Mohammad Vaziri received BS EE- 1980, MS EE -1990, and Ph.D. EE - 2000 degrees form UC, Berkeley, CSU, Sacramento, and WSU, Pullman WA, respectively. He has 24 years of professional experience at PG&E, and CAISO, and over 18 years of academic experience at CSU Sacramento, San Francisco, and WSU Pullman. Mohammad has authored and presented technical papers and courses in US, Mexico, and Europe. He is a senior member of the IEEE, actively involved in funded research for integration of renewable resources, and serves as member/advisor on various technical committees. Currently, he is a faculty in the Electrical and Electronic Engineering department at the CSU Sacramento and a part time technical consultant. Dr. Vaziri is a registered professional engineer in the state of California, and his research interests in Power Systems are; Operation, Planning, Protection, and Integration of Distributed Generation.

Session 4: *Distribution System Interconnection in CA: Latest Regulatory Trends*

Electric Rule 21 is a tariff that describes the interconnection, operating and metering requirements for generation facilities to be connected to a utility's distribution system, over which the California Public Utilities Commission (CPUC) has jurisdiction. This presentation will cover the latest regulatory trends and changes impacting CA Rule 21.

Speaker: Rachel Peterson – Policy Advisor to Commissioner Florio, CPUC

Rachel Peterson is a policy advisor on energy matters for CPUC Commissioner Mike P. Florio. At the CPUC, Ms. Peterson has worked extensively on distribution system interconnection regulatory matters, including leading a recent significant update to CPUC Electric Tariff Rule 21. She has also served as an interim policy advisor to CPUC Commissioner Carla J. Peterman.

Session 5: *Protection Interconnection Issues Related to Distributed Generation*

This presentation will cover protection issues and resulting interconnection requirements due to Distributed Generation Interconnections.

Speaker: Mike Jensen, PE – Supervising Protection Engineer, PG&E

Mr. Jensen has 21 years of experience in the power industry in transmission protection, substation design, generation protection, and nuclear power plant maintenance/design at Diablo Canyon Power Plant. His present position involves managing group workload and providing technical guidance for 11 Protection Engineers.

Mr. Jensen has extensive experience with all forms of protection schemes from distribution feeder protection, to transmission high speed communication assisted schemes, transmission transformer protection and generation protection. This includes protection scheme design, performing coordination studies, providing relay settings, and field support. He is the PG&E Protection Lead for transmission interconnected generation projects, specifying interconnection requirements and testing for interconnecting into the PG&E system which has over 12,000 MW of proposed photo-voltaic generation presently being studied or interconnected.

Presently a member of NERC Drafting Team for PRC 25-1 (Generator Loadability Standard), and IEEE member.

Mr. Jensen served six years in the U.S. Navy on board nuclear submarines as a nuclear power plant operator and technician. He received a Bachelor of Science in Electrical Engineering degree from California Polytechnic University, San Luis Obispo, California in 1992 and is a registered Professional Engineer in the State of California.

Session 6: *PV Interconnections: A Developer's Perspective*

This presentation will cover some of the challenges that PV Developers encounter during the Interconnection process.

Speaker: Jason Spokes, PE – Manager of Development Electrical Engineering SunPower Corporation

John Jason Spokes (M'10) was born in Metairie, Louisiana in 1977. He received the B.S. degree in Electrical Engineering from Louisiana State University, Baton Rouge in 2000 and the M.B.A. degree from University of New Orleans, New Orleans in 2002.

In 2000, he joined Waldemar S. Nelson & Co. in New Orleans, LA as an Electrical Engineer where he provided project design for oil & gas, petrochemical and electric utility projects throughout the United States. In 2005, he joined Consolidated Edison in New York City, NY as a Substation Engineer where he provided project design for new and upgraded high voltage substations throughout Consolidated Edison's territory. In 2010, he joined SunPower Corporation in Richmond, CA and currently holds the title of Manager, Development Electrical Engineering where he focuses on the front-end, conceptual design of PV plants and interconnection facilities throughout the United States.

Mr. Spokes is a Licensed Professional Engineer in the states of California, New York and Texas.