IEEE PES, Las Vegas Chapter Presents "Lunch and Learn"

Topic: Solar Flares and Power Transformer Interactions

Speaker: James McIver, P.E.

Date: February 8, 2013

Time: 11:00 – 11:30am lunch available for purchase in cafeteria

11:30 – 12:30 presentation

Location: NV Energy, Wengert Room, 1st floor

6226 W. Sahara Ave, Las Vegas, NV

RSVP: send e-mail with number of people to LVenter@nvenergy.com

Solar Flares & Power Transformer interactions

Solar flares cause the Northern Lights and flare activity on the sun's surface peaks during 12-14 year cycles. Major activity is expected during 2013 and 2014 and if large magnitude flares strike the earth at critical orientation, electrons in the upper atmosphere may create earth ground currents. Quasi-DC currents flow hundreds of miles and can enter long transmission lines through power transformer neutral connections.

As a result of solar flares, GICs (Geomagnetically-Induced Currents) are a topic of discussion within the power industry. Although rarely occurring, these dc currents can saturate transformers, create high levels of harmonics and overload capacitive var demands. Very little research is available from previous GIC events, so planning is needed to avoid unusual power system impacts.

Throughout 2011 and 2012, Siemens Transformer is participating in a GIC task force. It is sponsored by the National Electric Reliability Council, whose members are the system operators of major North American utilities.

Mr. Jim McIver will address the major components to this issue.

About the speaker:

Jim McIver has 35 years experience in the North American electric power industry. In January 2004, he joined VA Tech – USA as Technology Director, Transformers Business Division. During Siemens' acquisition of VA Tech, he assisted integration of the two groups' R&D staff. He now serves as Principal Application Engineer for Siemens Transformers US, assisting with special product applications.

As Nevada Power Staff Engineer, he managed strategic supply partnerships for design, procurement and maintenance of transformers, breakers and switchgear. During his tenure, over 8000 MVA of Elin transformers, shunt reactors and phase shifters were installed in Southern Nevada.

Mr. McIver was GE Senior Application Engineer and manager of distribution system research that grew five-fold & received 3 GE Managerial awards. As a consultant, he specified phase shifters, provided forensic analysis of transformer field failures and developed gas-in-oil diagnostics for sealed-tank, network transformers.

He began his career with Public Service Co. of NM, before joining GE in transformer R&D. Mr. McIver developed component and assembly techniques for GE's first fiber optic temperature sensors and investigated winding mechanical integrity in advanced (gas-insulated) transformers.

Mr. McIver is member of Eta Kappa Nu and IEEE Transformer Committee, and is Professional Engineer in the State of New York. He earned his MSEE from Rensellaer Polytechnic Institute and has authored IEEE and CIGRE papers on power transformers, engineering economics and harmonics.