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Present

Technical Talk on:

'Power System Modeling and Simulations: Differences and Propose for Power System Protection schemes'

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(Free admittance)

Synopsis: The main task of power system modeling and simulations is to understand the power system and interaction of its vital components as transformers, reactors and capacitor banks during disturbances.Thus, it is important to have an accurate model in order to appropriately have accurate results from the simulations and provide effective solution. Unfortunately, the lack of power system components data is a big challenge for power system modeling and simulation engineers to prove their models.

This presentation introduces an overview of the power system modeling and simulations focusing on the transient studies and steady-state simulations. The transmission line data calculation will be presented. How simulation results can affect the power system protection schemes will be illustrated on the most recent installation of the 30 MVA distributed generation connected to the BC Hydro/BCTC system. Stability and transient studies results indicated that some conditions can not be acceptable from system operation point of view and therefore, some remedial measures had to be taken. For instance, communication assisted power system protective scheme has been required on the transmission lines that were typically protected with communication independent scheme. This would provide faster clearing time for the faults on the line to avoid system instability in the system. Also, the studies have shown that there would be transient and temporary O/V when only small unit is in-service when there is a single line to ground fault (SLG)on the line. Such an overvoltage would be imposed on some distribution customers and would significantly exceed power quality guidelines. To maintain the power quality of the grid, the line was required to remain connected to the system on SLG fault condition until generation is disconnected.

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.