"Power System Protection Schemes in Modern Power Systems with Distributed Generation"

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Abstract: 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 transmission 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 system, 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 she is a senior member of IEEE. Meliha is a member of the IEEE Power & Energy Society (PES) Governing Board and she is currently serving as the Vice President for Chapters. Also, she is a corresponding member of the IEEE Power System Relay Committee (PSRC). She has written numerous technical reports and papers on the power system subjects and she is also a paper reviewer. Meliha is a distinguished lecturer of IEEE PES.

Meliha received numerous awards for her service to British Columbia's Power and Energy community through her leadership role in IEEE Vancouver Section and IEEE PES Chapter Chair. She participated at WIE and student branches events and she together with her women colleges from PES Governing Board inspired Cheryl Warren who wrote the on-line book "Women in Engineering – You Can Do It!". Meliha is a recipient of the 2010 IEEE Canada Award in recognition of dedicated and distinguished service to the profession".