Emergency generator startup study of a hydro turbine unit for a nuclear generation facility

This paper reports the implementation of synchronous generator, induction machine, hydro turbine, and governor system, and excitation and automatic voltage regulator system models for transient stability study. These models are frequency dependent and are suitable for system transient studies involving drastic frequency changes, including generator startup and emergency load startup. A computer simulation program has been developed using these models for a transient stability study. The developed program is further validated and verified using real system testing data that includes the cases of generator startup and full-load shed in a nuclear power generation plant. Validation results show overall an excellent correlation between the computer simulation and the field-testing data. As a result, the program has been accepted by the plant for system modeling and emergency generator startup simulation studies.