Feasibility Study Improving Robustness and Integrity of Korean Electric Grid

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Korean Electric Power Corporation (KEPCO) is working with Siemens Power Technologies International to conduct a feasibility study investigating technology-based solutions for improving robustness and integrity of the Korean electric grid. The approach is to be applicable to Siemens back-to-back HVDC Plus technologies, functioning as a “Grid Shock Absorber” preventing cascading failures, increasing available transmission capacity and reducing fault current duties.

The Korean power system, as shown in the figure below, is characterized by the majority of the load (about 43%) being concentrated in the Seoul area in the north while most of the generation is in the south. Therefore, most of the power is flowing from the southern areas of the grid to the northern area. This means long distance power transfer, which will result in voltage instability problems.

Figure 1 - Korean Electric Grid: High-voltage Transmission and Generation-load Distribution

The study is considering a number of load scenarios and multiple transmission contingencies. The results of this study will set the stage for the wide application of Siemens back-to-back HVDC Plus technology as a “Grid Shock Absorber” for smarter transmission grids.