Preliminary Investigation of a Proposed Site for SFCL Installation in the KEPCO's 154 kV Grid

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We have conducted preliminary investigation to propose a suitable site for superconducting fault current limiter (SFCL) installation in the KEPCO's 154 kV grid. This investigation limited the application SFCL to the bus-tie position of the grid in the Seoul area. First, we calculated maximum potential fault current for all substations. Then, among substations where the fault current exceeds the CB capacity, we selected two substations where buses are being operated untied. For the selected two, S and M S/S, fault currents at the M S/S were estimated to be 22.5 kA and 24.3 kA for two buses untied, respectively, but 44.2 kA if buses were tied. Simulation using a hypothetical SFCL of 5 Ohm impedance showed that it controlled the fault current under 20.1 kA for bus-tie position, 28.4 kA and 29.9 kA for both buses, respectively, each of which are under the capacity of the currently installed 31.5 kA GIS. For both substations a SFCL with 5 Ohm impedance successfully controls the fault current under the CB capacity, and 10 Ohm SFCL may be recommendable to maximize the SFCL effect.

keywords : Superconducting Fault Current Limiter (SFCL), fault current, bus-tie, line impedance