Efforts for SFCL Application and Points at Issue

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We present domestic efforts for superconducting fault current limiter (SFCL) application and pending points at issue. KEPCO's decision to upgrade the 154 kV/22.9 kV main transformer from 60 MVA to 100 MVA cast a problem of high fault current in the 22.9 kV distribution lines. The grid planners recommended to adopt an SFCL to control the fault current. This environment friendly to SFCL application must be highly dependent upon the successful development of the hybrid SFCL. The hybrid SFCL consists of HTS SFCL components for fault detection and line commutation, a fast switch (FS) assembly to line-commute the current from the primary path to the secondary path having a current limiter. This characteristic structure not only enables excellent current limiting performances including the reclosing capability, but also allows drastic reduction of HTS volume and small size of the cryostat, resulting in economic feasibility and compactness of the equipment. For the grid application of a hybrid SFCL, first a prototype machine having the rated current of 630 A will be assembled and installed in the KEPCO's Gochang test yard for field test. This test is to perform long term operation and protection coordination study. Then, we will upgrade the machine to have the ratings of 22.9 kV/2.5 kA for the live grid test followed by the grid application for commercial operation. There are many pending points at issues such as maintenance-free long term operation, small size to accommodate the in-house substation, back-up plans, diagnosis, and so on. We will discuss those points at issue in detail and proposed plans to meet the requirements.

Keywords : fault current, superconducting fault current limiter, hybrid type, field test