Capacity Increase Method of Hybrid-type SFCL According to the Inductance of the Secondary Winding with YBCO Films

Yong-Sun Cho*, Hyo-Sang Choi, Hyoung-Min Park
Chosun University, Gwang-ju, Korea

We investigated the operational characteristics of the hybrid-type superconducting fault current limiter (SFCL) according to the inductance of secondary windings. The SFCL consists of a transformer, which has a primary winding and a secondary winding with serially connected $YBa_2Cu_3O_7$ films.

Resistive-type SFCL has a difficulty to increase the capacity of the SFCL due to slight differences of critical current densities of units and structure of the SFCL. The hybrid-type SFCL with closed-loop could achieve the capacity increase through the electrical isolation and through the reduction of the inductance of the secondary winding with a superconducting element of the same critical current. On the other hand, the current limiting characteristics was nearly same in the hybrid-type SFCL with open-loop compared to closed-loop, but quench time was longer than the hybrid-type SFCL with closed-loop.

We confirmed that the capacity of the SFCL was increased effectively by the reduced inductance of the secondary winding. In addition, the power burden of the system also could be reduced by reducing the inductance of secondary winding.

We will investigate the method for simultaneous quench through serial and parallel connections of current limiting elements.

keywords : Hybrid-type superconducting fault current limiter, Capacity increase method, Power burden, Inductance

Acknowledgement

This work has been supported by KESRI(R-2005-B-145), which is funded by MOCIE(Ministry of industry and energy).