

Fault Current Limiting Characteristics of Flux-lock Type SFCL using Magnetic Field Application

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We analyzed the fault current limiting characteristics of a flux-lock type high-Tc superconducting fault current limiter (HTSC-FCL) using series resonance between capacitor for series resonance and magnetic field coil which was installed in coil 3. The capacitor for the series resonance in the flux-lock type HTSC-FCL was inserted in series with the magnetic field coil to apply enough magnetic field into HTSC element, which resulted in higher resistance of HTSC element. However, the impedance of the flux lock type HTSC-FCL has started to decrease since the current of coil 3 exceeded one of coil 2 after a fault accident. The decrease in the impedance of the FCL causes the line current to increase and, if continues, the capacitor for the series resonance to be destructed. To avoid this operation, the flux-lock type HTSC-FCL requires an additional device such as fault current interrupter or control circuit for magnetic field. From the experimental results, we obtained the parameter range where the operation as mentioned above for the designed flux-lock type HTSC-FCL using series resonance occurred.

keywords : flux-lock type high-Tc superconducting fault current limiter, magnetic field coil, capacitor for series resonance, HTSC element, fault current interrupter, control circuit for magnetic field.