

The Characteristics of Initial Peak Line Currents in the Closed-loop and Open-loop Flux-lock Type SFCL

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Superconducting fault current limiters(SFCLs) are expected to improve not only reliability but also stability of real power systems. The Flux-lock type SFCL using the YBCO film among SFCLs was fabricated for application on the inductance of coils and iron core. This consists of the primary and the secondary copper coils wound in parallel each other through the iron core.

We compared the current limiting characteristics on the additive polarity winding operation between closed-loop and open-loop flux-lock type SFCL. To analyze fundamental properties, we investigated the current limiting characteristics of resistive type SFCL. When the applied voltage was 160 [V_{rms}], initial peak line current in case of closed-loop was changed from 13.59 to 8.78 within the first half cycle after a fault. The value in case of open-loop was changed from 13.68 to 8.74 under the same condition. Meanwhile, abrupt fluctuation was occurred after the fault instant. We considered that this caused by the inductance of the primary coil. This fluctuation of the initial peak line currents was generated by the quench of a superconducting element connected in secondary winding.

keywords : initial peak line current, closed-loop and open-loop flux-lock type SFCL, additive polarity winding