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Wed-Mo-Po3.09-08 [70]: Magnetizing Characteristics of Bridge Type SFCL with Simultaneous Quench Using Flux-Coupling

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With the development of modern power systems, the generation of fault currents and the system sensitivity to fault currents have increased. A superconducting fault current limiter (SFCL) is emerging as an alternative to reducing such fault currents in alternating current (AC) and direct current (DC) systems. SFCL can perform faster current limit operation as well as automatic fault current detection and recovery, regardless of fault type. Conventional bridge type SFCL applicable to DC systems requires a controller and an interrupter to protect the superconducting coils due to faults. This conventional method has a disadvantage that the configuration cost and control are somewhat complicated.
In this paper, a flux-coupling type SFCL using only two HTSC elements and two coils was fabricated to analyze the fault current limiting characteristics in a DC system. Before and after the accident, the current limiting operation and the voltage waveforms of each device were compared. We also analyzed flux linkages and instantaneous powers of flux-coupling type SFCL composed of HTSC elements with different critical currents. During the fault period, the magnetization power area and the flux linkage's operating range variation according to the magnetization current were compared with each other.

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