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Analysis of Interruption Characteristics According to Application Position of Inductor-Combined Superconducting DC Fault Current Limiter

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The existing CSC-HVDC system must compensate for reactive power because of the using thyristors as power conversion switching elements. It is impossible to control active power and reactive power independently. The VSC-HVDC system is receiving attention for solving such a problem. In VSC-HVDC, the study of fault current interruption is necessary to improve the stability and reliability. In this paper, We applied the inductor-combined superconducting DC fault current limiter to interrupt the fault current. This technology can quickly cutoff fault current. Also, It can reduce the burden of the superconducting fault current limiter and the mechanical DC circuit breaker. Using the EMTDC/PSCAD, Our team has designed the VSC-HVDC system and checked the fault current interruption characteristics corresponding to the application position of inductor-combined superconducting DC fault current limiter. As a result, we confirmed that the inductor-combined superconducting DC fault current limiter can be reliably interrupted in the DC link section, back of converter and in front of inverter, of the VSC-HVDC system. And it was confirmed that the burden of the superconducting fault current limiter and the mechanical DC circuit breaker were reduced by 30%. Also, The optimum breaking capacity of the inductor-combined superconducting DC fault current limiter was selected according to the application position.

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