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Thu-Mo-Po4.11-07 [80]: HTS Fault Current Limiting Module to Reduce Burden of a DC Circuit Breaker for 30 kV MDVC Power Grid

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We have studied a DC circuit breaker with an HTS fault current limiting (FCL) module for 30 kV MDVC power grid. The attached FCL module can reduce the burden of the circuit breaker to make the system break the fault current faster as well as safer. In this paper, we will present the design of an HTS fault current limiting module with 2G REBCO conductor for the MVDC power grid with the rated voltage of 30 kV. Among several different type of 2G REBCO conductors from different suppliers, we selected the most suitable conductor, which was SuNAM's stabilizer free REBCO conductor, based on the previous short circuit tests with sample conductors. With this material, an FCL module was designed to reduce the DC fault current from 25 kA to 1.6 kA in 2 milliseconds at most. In order to show the feasibility of the study, we fabricated a scale-down model with the selected conductor and we also carried out several short circuit tests in the low voltage testbed.

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