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Wed-Mo-Po3.08-04 [56]: Design of a novel inductive type fault current limiting

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In a power system, fault currents are on the rise and are becoming a common problem. Although several methods are used to restrict fault currents, the methods have demerits in respect of stability and reliability of power system. In this regard, high temperature superconducting (HTS) fault current limiting applications are considering as an alternative and a number of related researches are in progress.
The authors suggest a novel inductive type fault current limiting HTS power cable, which takes the form of wound cable with iron core. When fault current traveling through the cable, the HTS shield layer experiences a transition from the superconducting state into a resistive state by the quench. It causes release of magnetic flux generated by the current to the out of shield layer, then the amount of magnetic flux interlinkage for the wound cable increases and inductive impedance also increases. The cable provides two merits, which are no additional insulation for the fault current limiting function and quick recovery time after fault clearance due to very low heat generations on the HTS layers.
In this paper, a novel inductive type fault current limiting HTS power cable was suggested and its effect was described through design and simulation results. The results are discussed in detail.

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