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Winding Technology And Experimental Study On Superconductive Fault Current Limiter

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The development of 500 kV saturated iron core superconductive fault current limiter(SFCL) is in progress. The magnet consists of 88 high temperature superconducting(HTS) double pancake coils with an inner diameter of 1940 mm and outer diameter of 2040 mm. Double pancake coil plays an important role in 500 kV SFCL, the structure and winding process have great influence on current carrying capability and reliability of the coil. In this paper, the key technology of winding process of the world's largest HTS coil was introduced, which included critical current measurement of HTS tapes under radial bending, insulating treatment of double pancake coil and the former, winding of the coil and welding of the joints. The V-I curve of the HTS coil was also investigated under the condition of liquid Nitrogen in self magnetic field. The experimental results show that the double pancake coil have good properties and the processes are reliable and suitable for manufacturing 500 kV SFCL. The study will not only provide important references for large HTS coils fabrication, but also accumulate experience and data for other similar engineering practices. Key words: Saturated iron core superconductive fault current limiter, double pancake coil, coil winding process, welding procedure, HTS coil V-I curve.

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