Fault Current Limitation by a Transformer Type FCL Based on the Second Generation HTS Wires

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Abstract - A transformer type superconducting fault current limiter (FCL) for electric power grids was developed utilizing a nonlinear resistor made of the second generation HTS wire. Using of the second generation HTS wire instead of the first one was found to reduce by an order the required amount of superconducting materials. Fault current limiting action and transients in an electric circuit with the prototype FCL have been studied. The effective limitation of peak and steady state fault current was demonstrated using the FCL. The physical basis of the FCL operation was investigated by studying a superconducting-to-normal transition in the second generation HTS wires.

Index Terms - high-temperature superconductors, fault current limiters, transformers, transient analysis

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