MT 26
International Conference
on Magnet Technology
Vancouver, Canada | 2019

Contribution ID: **1089** Type: **Poster Presentation**

Wed-Mo-Po3.09-12 [74]: Numerical Analysis of the 6 kV / 140 A Conduction Cooled Flux Coupling Type Superconducting Fault Current Limiter.

Wednesday 25 September 2019 09:30 (1h 45m)

Fault current is one of the basic threats to the elements of power systems. Fault current in a shorted circuit is usually many times greater than the current occurring during normal operation of the network equipment. Fault current flow can cause thermal and dynamic harmful effects on the operation of power equipment. Electrodynamic forces occurring during the fault current flow can mechanically damage electrical equipment. Any such damage causes costly and time-consuming repairs. A superconducting fault current limiter is an electrical device with low impedance under normal operating conditions that changes into a state of high impedance during a short circuit, limiting the fault current. Superconducting limiters reduce the first, most dangerous peak fault current, thus protecting electrical system equipment from the dynamic effects of the fault current flow. In recent years the superconducting resistance fault current limiter for networks with rated voltage of 6 kV and rated current of 140 A with the possibility of overloading to 420 A was designed and tested. The limiter is conduction-cooled by means of a single-stage cryocooler. It is first Polish superconducting limiter for 6 kV network which uses conduction cooling. Changing the cooling method of the superconductiong limiter from liquid nitrogen bath to conduction cooling allows to increase the nominal current of the limiter by cooling the windings to lower temperatures and effectively limit several consecutive short circuits. The prototype of the limiter was tested in the Research Laboratory of Distribution Apparatus of the Electrotechnical Institute and installed for test in the GS2 110 kV / 6 kV switchgear in the Electrotechnical Institute in Warsaw. This paper presents the numerical model and the calculated electrical parameters of the new 6-kV class SFCL prototype.

Authors: Dr MAJKA, Michal (Lublin University of Technology); Prof. KOZAK, Janusz (Electrotechnical Institute); Prof. KOZAK, Slawomir (Electrotechnical Institute)

Presenter: Dr MAJKA, Michal (Lublin University of Technology)

Session Classification: Wed-Mo-Po3.09 - Current Limiters II