Coil in Coil – Components for the High Voltage Superconducting Resistive Current Limiter CULT 110

Steffen Elschner(2), Mark Stemmler(3), Frank Breuer(1), Heribert Walter(1), Christian Frohne(3), Mathias Noe(4) and Joachim Bock(1)

(1) Nexans SuperConductors GmbH, D 50351 Huerth, Germany
(2) Hochschule Mannheim, D 68163 Mannheim, Germany
(3) Nexans Deutschland Industries GmbH & Co. KG, D 30179 Hannover, Germany
(4) Forschungszentrum Karlsruhe GmbH, D 76021 Karlsruhe, Germany
E-Mail: mark.stemmler@nexans.com

Abstract - The project CULT 110 funded by German government (BMBF/VDI) is presently the largest current limiter project in Europe. It aims at the development of a one-phase resistive limiter for the 110 kV level and is based on melt cast processed BSCCO 2212 bulk superconductor. The innovative electrical protection concept uses a normal conducting coil arranged around the superconducting bulk coil and connected in parallel. This coil serves as an electrical bypass and simultaneously, under fault conditions, generates a magnetic field for quench homogenisation. Since no continuously connected shunt is needed, an increased voltage can be applied during faults.

Manuscript received December 14, 2007; accepted Jan 11, 2008. Reference No. ST24, Category 6. Based on paper submitted to Proceedings of EUCAS 2007; published in JPCS 98 (2008), paper # 012309