26th National Symposium on Cryogenics and Superconductivity

Contribution ID : 60

QUENCH ANALYSIS OF 1.5 T SUPERCONDUCTING MRI MAGNET

Thursday 23 Feb 2017 at 15:30 (00h15')

Content :

A national project on indigenous development of whole body 1.5 T superconducting magnetic resonance imaging (MRI) system has been initiated by Meity, Govt. of India. The 1.5 T MRI magnet will have multi-coil solenoidal structure to be operated at a current density of 140 A/mm^2. The total stored magnetic energy is about 4.5 MJ. The higher store energy of the magnet makes it necessary to design an efficient quench protection system for the MRI magnet to avoid any damage due to localized temperature rise or any voltage arcing during quench. This paper presents the details of the quench characteristics of 1.5 T MRI magnet simulated using OPERA. The transient thermal mapping of 1.5 T magnet is also discussed in detail in this paper. It also discusses the comparison of quench behavior with different types of quench protection system.

Primary authors : Mr. SONI, VIJAY (INTER UNIVERSITY ACCELERATOR CENTRE, NEW DELHI)

Co-authors : Mr. KAR, SOUMEN (INTER UNIVERSITY ACCELERATOR CENTRE, NEW DELHI) ; Mr. SUMAN, NAVNEET (INTER UNIVERSITY ACCELERATOR CENTRE, NEW DELHI) ; Mr. THEKKETHIL, SANKAR RAM (INTER UNIVERSITY ACCELERATOR CENTRE, NEW DELHI) ; Mr. KUMAR, MUKESH (INTER UNIVERSITY ACCELERATOR CENTRE, NEW DELHI) ; Mr. KUMAR, RAJESH (INTER UNIVERSITY ACCELERATOR CENTRE, NEW DELHI) ; Mr. SHARMA, RAM GOPAL (INTER UNIVERSITY ACCELERATOR CENTRE, NEW DELHI) ; Mr. HARSH, RAJESH (SOCIETY FOR APPLIED MICROWAVE ELECTRONICS ENGINEERING & RESEARCH, MUMBAI) ; Mr. DATTA, TRIPTI SEKHAR (INTER UNIVERSITY ACCELERATOR CENTRE, NEW DELHI)

Presenter : Mr. SONI, VIJAY (INTER UNIVERSITY ACCELERATOR CENTRE, NEW DELHI)

Session classification : Technical Session 8

Track classification : Heat Transfer / Thermal Insulation / Thermal Analysis

Type : Contributory Talk