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STRESS ANALYSIS OF CRYOGENIC SUPPORT STRUCTURE OF SUPERCONDUCTING MRI MAGNET CRYOSTAT

Content :

Support system is one of the most critical components of any zero boil off MRI cryostat. We have designed twelve self-centering support structures for the warm bore horizontal test rig for testing of superconducting magnet of 1.5T MRI system. The support system also needs to take care of the load during road transportation of the magnet system. The dimensional constraints as well as requirements for structural stability and heat conduction has been established after identification and consideration of problems associated with superconducting magnet support systems in MRI. The design developed incorporates carbon fibre/epoxy tension straps with intermediate thermal intercepts at 60-80K and has been designed to suspend the five tons cold mass during assembly, shipment and normal operation of the MRI magnet. The estimate heat load through the support system is 0.3-0.4 W at 4.2K. This paper briefly discusses the static and dynamic stress simulation of cryogenic support link of the MRI cryostat using ANSYS.

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