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First Operational Results of the SST-1 Superconducting Magnet Cryogenics Systems

Thursday 10 July 2014 14:00 (15 minutes)

The Steady State Superconducting Tokamak (SST-1) at Institute for Plasma Research has been commissioned with the successful experimental validations of its magnet systems and cryogenic systems last year. The first plasma in SST-1 has been obtained on June 20, 2012. The cryo-magnetic systems of SST-1 have been operating successfully since then, in several successive plasma campaigns. Unlike other contemporary cable-in-conduit-conductor (CICC) based superconducting Tokamak magnet, the CICC in Toroidal Field (TF) winding packs are cooled with two phase helium from a dedicated 1.3 kW helium refrigerator liquefier plant. The TF magnets in SST-1 together with other magnets have been supporting creditable plasma operational scenarios since then with the TF magnets being charged up to a maximum of 1.8 T on the plasma major radius so far. The vapour cooled current leads of SST-1 are also uniquely operated with cooled helium vapour all along instead of liquid helium being put in the lower superconducting sections. The operational experiences with SST-1 TF magnets, PF magnets and the supporting 5 K and 80 K cryogenic system contributing towards successful operations of SST-1 plasma experiments will be elaborated in this paper.

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