

Summary Slide

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OPERATIONAL RESULTS AND TROUBLESHOOTING IN CURRENT FEEDER SYSTEM FOR SST-1

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The total 25% of the total operation cost of a fusion reactor is consumed by the current leads only. At the same time, fusion is one of the clean sources of energy to meet the increasing demand of energy.

In support of these efforts, IPR in India has built SST-1 tokamak to carry out experiment on this path. Any superconducting (SC) fusion devices and SST-1 demands extensive use of SC magnets which needs to be excited at several kA through current feeder system consisting (CFS) consisting of current leads (CLs).

Indigenous development of current feeders system (CFS) has achieved two major milestones during recent plasma experiment of SST-1 in January 2018, in terms of transported current (up to 7.9 kA) as well as long pulse duration excitation (6 hours and 30 minutes continuous):

Successful charging of 7.9 kA current may contribute to produce 2.5 T field at the plasma center to meet higher plasma confinement.

Likewise, steady-state reliably current operation duration exceeding ~ 6 hour and 30 minute will provide more opportunity to perform at 1.5 T field with more variety of plasma shots without interruption.

In future, an effort is in process to operate the PF coils to elongate the plasma shape. As circular plasma experiments are presently conducted and achieved. Therefore, the activities related to re-installation of PF-3 CLs in CFS are in progress to make ready for the plasma shaping operation.

Therefore, the CFS necessitating to SST-1 will likely contribute new learning to support the fusion community.