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Thu-Mo-Po4.02-05 [10]: Concept Design of magnet system of the large scale superconducting conductor test facility for future fusion reactor

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“China Fusion Engineering Test Reactor (CFETR)” is a new generation of tokamak which aims to bridge the gaps between the fusion experimental reactor ITER and the demonstration reactor (DEMO). The superconducting magnet system is the core component in tokamak and future fusion reactor, and the superconducting magnet system for CFETR will be a big challenge due to the higher magnetic field is required. Base on current design, the maximum field of Toroidal Field (TF) coil is around 14.5 T, and for Center Solenoid (CS) coil, the maximum field would be even higher. Now the significant work is developing high performance Cable-in-Conduit Conductor (CICC) for these high field coils.

Obviously, a test facility is necessary for developing new CICCs. It is well known that SULTAN facility plays an important and successful role in ITER conductors development, almost all ITER sample conductors were tested at SULTAN. But it's hard to satisfy future test work due to its magnetic field limitation (<12 T). Now in China, a new program has been launched to build a new conductor test facility which has similar functions to SULTAN, but can provide background field up to 15 T. This paper will introduce the concept design of the magnet system of the superconducting conductor test facility.

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