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## P3.075 Design Updates of Magnet System for Korean Fusion Demonstration Reactor K-DEMO

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Based on the Korean Fusion Energy Development Promotion Law was enacted in 2007, a conceptual design study for a steady-state Korean fusion demonstration reactor (K-DEMO) was initiated in 2012. One of the key components of the K-DEMO, the superconducting magnet system consists of 16 TF (Toroidal Field), 8 CS (Central Solenoid) and 12 PF (Poloidal Field) coils. All of the TF, CS and PF coil system use internally-cooled Cable-In-Conduit Conductors (CICC). By using high performance Nb<sub>3</sub>Sn-based superconducting conductor currently being used in accelerator magnet area, the TF coil system provides a field of 7.4 T at a plasma center with a peak field of 16 T. Key features of the K-DEMO magnet system include the use of two TF coil winding packs, each of a different conductor design, to reduce the construction cost and save the space for the magnet structure material. Also, the configuration is constrained by maintenance considerations, leading to a magnet arrangement with large TF coils, which minimize the magnetic ripple, and widely-spaced PF coils to accommodate the enlarged vacuum vessel upper ports to remove the in-vessel components as large sectors. CICC connection scheme between coil systems has been developed as well. The fabrication of the test specimens for the each type of TF, PF, CS CICC was also performed to check the fabrication feasibility. The K-DEMO magnet system has been evolved mainly for solving engineering issues. The major parameters and design of magnet system including the supporting structural analyses will be presented.

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