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FTP/P1-21: Status and Plan of the Key Actuators for KSTAR Operation

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After 1st plasma in 2008, the Korea Superconducting Tokamak Advanced Research (KSTAR) has been intensively upgraded to supply key actuators such as in-vessel components and heating system. The in-vessel components satisfactorily provided an essential condition for experiments on plasma shaping, H-mode, and edge localized mode (ELM) suppression in 2010 and 2011. There was also a big progress in upgrade of heating system. The neutral beam injection system demonstrated 1.5 MW of NB power with 95 keV of beam energy. The 170 GHz ECCD system provided an additional tool for ECH pre-ionization experiment with 0.6 MW/2 s of launched power. Upgrade of the key actuators in 2012 is mainly focused on upgrade of NBI and Lower Hybrid Current Drive (LHCD) system. After upgrade of the NBI system, available total NB power is expected to be more than 3.0 MW in 2012 campaign. LHCD system using 5 GHz is being developed with 8 arrays of 4-way splitter waveguide launcher. After minor upgrade, there will be a major change in heating system and in the diverter concept in 2nd stage of KSTAR operation from 2012 to 2016. In this period, the heating and current drive system will be extended in the deliverable power to 14 MW with 8 MW of NB and 2 MW of LHCD and ECCD.

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