NSTX-U Weekly Report (September 27, 2014)

NSTX-U is in the Upgrade Project outage in FY 2014

Keii Gi of University of Tokyo completed his two-month visit to NSTX-U/PPPL. During his stay, as a part of his Ph.D. thesis work, he refined his conceptual study of superconducting spherical tokamak power plant incorporating the NSTX data base. He utilized the NSTX H-mode plasma parameters and profiles for a higher bootstrap current fraction equilibrium for the ST reactor which is stable against MHD (kink/ballooning) modes. A plasma ramp-up equilibrium calculation shows a possibility of non-inductive ramp-up scenario with two NBIs with different beam energies. For future collaboration, a time-dependent ramp-up simulation will be performed in collaboration with NSTX-U/PPPL researchers. (K. Gi)

Engineering Operations (A. von Halle, C. Neumeyer)

NSTX Upgrade activities continued with the installation of the lower PF1A on the centerstack TF/OH assembly. Installation of flux loops and thermocouples are in progress, and will be followed by the installation of the Rogowski coil before the assembly is moved to the high bay adjacent to the NSTX-U test cell next week. The installation of tiles and diagnostics on the centerstack casing has been completed. The in-vessel floor and ex-vessel 109' platform at bays A and L have been removed to allow for the lower ceramic break and centerstack pedestal installation. The centerstack pedestal is now in place under the NSTX-U vessel, and the ceramic break/PF1C lower coil assembly is in the test cell. The PF1C upper coil assembly is nearing completion in the shop.

Commissioning of the new Digital Coil Protection System (DCPS) continued with ongoing pre-operational testing of software and hardware. The Water system PLC is ready to support operations. Good progress continues on the Power Supply Real Time Control (PSRTC) software specification.

Preparations of non-upgrade equipment for plasma operations in the NSTX-U configuration also continued. The Neutral Beam (NBPC) and Field Coil (FCPC) power conversion power supplies are being prepared for power testing. The fabrication of ex-vessel MPTS diagnostic equipment such as the Collection Optics Box and the Flight Tube Assembly continues in several PPPL shops.

Access to the NSTX test cell will be available only through previous arrangement with the Upgrade Work Control Center.

Completed CS components readied for the final assembly (September 2014)

Center-stack casing with tiles and sensors

Center-Bundle with PF-1A lower installed

PF-1A lower