NSTX-U Weekly Report (April 3, 2015)

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

The 2nd Quarter Report of the JRT-15 was submitted to FES/DOE. The report summarizes the plans to address the JRT-15 goals of "quantifying the impact of broadened current and pressure profiles on tokamak plasma confinement and stability". NSTX-U plans include experiments to characterize plasma performance as the NBI mix is varied to achieve broader current and pressure profiles. The initial run plan has been discussed with the NSTX-U research team at the NSTX-U Monday Meeting on 03/30. In a first experiment, scenarios at two Ip values (at fixed Bt=0.65T) will be explored using combinations of sources from the 1st and 2nd NBI lines. A second experiment will study plasma confinement as a function of Bt and plasma current. Stability of MHD and other fast ion driven modes will be investigated to quantify the plasma performance. Initial plans for coordinated analysis and experiments with DIII-D and C-Mod have been defined, with emphasis on performance improvement with off-axis current driven by either NBI or Lower Hybrid waves. Scenarios with elevated qmin>1.5 will be the primary target for cross-machine comparison. (Mario Podesta, PPPL)

J. Menard (PPPL) visited the Culham Centre for Fusion Energy (CCFE) in the UK on March 30-April 1 to discuss collaboration opportunities and participate in the advisory committee for CCFE. (J. Menard)

Experimental Research Operations (S. Gerhardt, R. Kaita)

The Electron Cyclotron Heating - Preionization (ECH-PI) Startup procedure PTP-RF-044 has been completed and the system is operational. A ECH-PI setup LabView control application has been written for the RF pulse setup. It is now running on the RF control computer located in the HHFW 1-2 area. The ECH-PI system is ready for supporting operations on NSTX-U. (J. Hosea, PPPL)

Engineering Operations (A. von Halle, P. Titus)

NSTX Upgrade activities are drawing to a close with the completion of the lower umbrella lid and the installation new lead clamps on the PF2 and PF3 coils. Final scrubs of machine areas are in progress for the vessel bake and subsequent coil power testing.

The Digital Coil Protection System (DCPS) and the Power Supply Real Time Controls (PSRTC) are complete and ready to support Coil System Power Testing. Commissioning of the Plasma Control System (PCS) also continued with the PCS successfully demonstrating the ability to control power supply currents during some of the dummy load testing.

Preparations for plasma operations in the NSTX-U configuration also continued. Dummy load testing of all of the power supplies required for CD-4 plasma operation has been successfully completed. Coil System flow switch calibrations will be performed next week with the restart of the cooling water systems, and systems are being configured for a bake of the vessel center column. Installation of ex-vessel MPTS equipment continues. Coil Cooling System hose installations/hydrostatic testing has been completed for the TF, OH, and PF coils, and flow switch calibrations are in progress. Also, end-to-end plasma current (Ip) Calculator testing

needed before CD-4 plasma operations has been completed, including all of the Rogowski signals and the vessel current sums. Pre-operational testing of the field coils (insulation testing, resistance and polarity checks, impulse testing etc) will be performed this coming Monday. The center-stack bake is scheduled for the latter part of the week. Inner and outer vacuum vessel electrical insulation checks (hi-pots) are now being performed daily

Access to the NSTX test cell will be available only through Work Permits approved by the D-Site Shift Supervisors.