

NSTX Weekly Report (Mar. 9, 2007)

FY 2007 NSTX plasma operations started on Feb. 19, 2007.

Planned: 10 weeks

Completed: 1.96 weeks (through Mar. 2, 2007)

- Michael Bell visited the University of Texas at Austin where he presented a seminar entitled "New capabilities and results for the National Spherical Torus Experiment (NSTX)" to staff and students of the Institute of Fusion Studies and the Fusion Research Center on March 6. He held discussions with researchers there on collaborative work in the areas of energetic particle instabilities, turbulence and electron transport and on innovative schemes to ameliorate plasma wall interactions. He also presented a Physics Department Colloquium on March 7 on the subject "Magnetic Confinement Fusion at the Crossroads".

Run Coordination (D. Gates, M. Bell)

On Thursday March 1st XP-713 entitled "Beta scaling of confinement in weakly shaped plasmas" was performed. Data was obtained in H-mode plasmas where with kappa as a low as 1.9.

On Friday March 2nd the MSE calibration XMP-33 was completed. In the afternoon XP-708 entitled "Divertor heat flux reduction in highly shaped plasmas" was run. Good data was obtained in plasmas where the outerstrike point position was held fixed at $R \sim 41$ cm with drsep ~ 1 cm and an inner gap of ~ 6 cm ensuring the bulk of the input power was deposited at a fixed location on the lower divertor. Deuterium was puffed into both the private flux region and the outer strike point. Reduced target temperature was observed

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

NSTX entered a maintenance period after completing a Motional Stark Effect (MSE) diagnostic calibration using neutral beams into a gas filled torus. This scheduled one week maintenance period has been extended to allow time to remove the neutral beam calorimeter in order to replace a leaking bellows. There will be a short vacuum vessel bake following the completion of this work. Considering this schedule change, the Lithium Pellet Injector (LPI) will not be re-installed on NSTX as planned this week, but will instead be set up to continue off-line testing. Also this week, testing of the new LITER 1d lithium evaporator continued, and the CHI voltage dividers were calibrated in preparation for an upcoming CHI experiment.

The NSTX test cell will remain in free (card reader) access through the coming week.

Research Operations (M. Bell)

Ben Penaflor of General Atomics visited PPPL this week to help develop the upgraded plasma control system for NSTX. He installed an updated version of the PCS software including the NSTX developed algorithms. He then tested the new system in "simulation mode". Good agreement was found between

the simulated power supply requests and those from the shot being simulated. Further tests are planned for the coming week. (D. Gates)

Boundary Physics Operations (H. Kugel)

- The reconfiguration of the LITER-1d, unit-1 ceramic thermal insulation was completed. Preparations are in progress for an air-bake of the assembly and installation of the outer radiation shields. In the Lithium Test Facility, good base pressure conditions were achieved after the successful reconfiguration of the pumping system.
- The scheduled maintenance on the LPI was completed, and preparations started for offline velocity calibrations of special sabots suitable for powder experiments. (T. Czeizinger)

Diagnostic Operations (R. Kaita)

- The microwave source power supply for the high-k scattering turbulence diagnostic was repaired at the University of California at Davis, and it is en route to PPPL.
- The SPRED vacuum ultraviolet (UV) survey spectrometer has been reassembled and is being pumped down. The response of the phosphor will be tested with a UV lamp once the instrument reaches its operating pressure.
- M. Lawrence of the Lawrence Livermore National Laboratory (LLNL) visited PPPL last week. He performed adjustments to the LLNL XEUS X-ray spectrometer to improve its signal levels.