NSTX Weekly Report (Mar. 25, 2005)

FY2005 Planned Operations: 17 weeks
Completed: 0 weeks producing 0 plasmas

Department, Project, Program (M. Ono, M. Peng, M. Williams, E. Synakowski)

• NSTX Project received the New Jersey State Commissioner of Labor and Workforce Development Continued Excellence Award for having gone 4 consecutive years without an away from work lost time injury/illness case. These awards will be presented at an upcoming Governor's Occupational Safety and Health Awards Program Area dinner. (J. Levine, ES&H)

• Yuichi Takase (U. Tokyo) is visiting PPPL from Mar. 21 to 29 to collaborate on the development of a scenario for plasma start-up using plasma merging. The central solenoid (OH coil) will not be used in this scenario. Two plasmas are created at null points formed by PF1A, PF2 and PF4, at the top and bottom ends of the vacuum vessel. Plasma current is ramped up by induction using PF2, PF3, PF4 and PF5 coils. During current ramp-up, the two plasmas approach each other and merge to form a single ST plasma. If the merging process could be controlled, ion heating associated with magnetic reconnection could be utilized effectively to create a high-beta plasma quickly. Start-up to plasma current of the order of 100kA is predicted by modeling. (J. Menard)

• Nobuhiro Nishino (Hiroshima University) visited PPPL during the past week. He engaged in discussions with PPPL staff about future collaborative measurements of flow velocities on NSTX. Professor Nishino will be proceeding this weekend to General Atomics (GA), where he will obtain fast visible camera images of plasmas in the DIII-D tokamak. This is part of a collaborative effort involving GA, the Lawrence Livermore National Laboratory, the Oak Ridge National Laboratory, and PPPL. (R. Kaita)

• The NSTX Team Meeting was held on held on March 23. The outage status and the preparation for the plasma operations were discussed. A brief summary of the Budget Planning Meeting was also given. The presentation material is available on the NSTX Web.

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

The NSTX outage continued this past week with the completion of the in-situ testing of all 72 TF joints, providing the baseline of joint resistance measurements for upcoming operations. Real-time resistance measurements will be made for all joints during the run. The TF flexible bus links are now being installed, and machine area scrubs, as well as gas system calibrations, TIV and

shutter testing, and subsystem interlock testing will be completed early in the week in preparation for integrated system power testing. The neutral beam cryopanels have been cooled to liquid helium temperatures, and the beamline to torus isolation valve has been opened bringing the NSTX vessel pressure down to 5E-8 Torr. The restart of the neutral beam ion sources is in progress. The Switching Power Amplifier (SPA) supply needed to power the error field coils for Resistive Wall Mode experiments has completed power testing into a dummy load.

The NSTX test cell will be in restricted access during integrated system power testing this coming week. The test cell will be placed in controlled access from 5 PM to 10 PM each evening to allow equipment maintenance and calibrations. A machine area scrub will be performed from 10-11PM each evening in preparation for the following day's run. (A. von Halle)

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

• LPI reassembly was completed. Off-line testing is in progress. The fabrication of additional pellet cartridges was completed.

• D. P. Stotler and C. H. Skinner made presentations at the "New Directions for Computer Simulations and Experiments in Plasma-Surface Interactions for Fusion" Workshop this week at ORNL. The titles of their talks were "Plasma-Surface Interaction Processes in a Neutral Transport Code - What's Not in the Model" and "Is Carbon a Realistic Choice for ITER's Divertor?", respectively. The workshop drew 61 participants, including many international and ITER-affiliated experts. Highlights included exciting advances in molecular dynamics codes that revealed plasma surface interactions in atomic detail and the latest experimental data on plasma surface interactions issues for ITER. The end result was a clear picture of the current state of computational approaches to plasma-surface interactions and a list of suggested future applications of those codes.

Diagnostic Operations (R. Kaita)

• Installation of the waveguide for high-k microwave scattering turbulence diagnostic was completed inside NSTX Test Cell.

• Successful computer-controlled operation of supersonic gas injector was verified with gas flow measurements during deuterium injection into NSTX vacuum vessel.