NSTX Weekly Report (Apr. 03, 2009)

FY 2009 NSTX plasma operations

Planned: 16 run weeks

Completed: 1.61 run weeks

NSTX researchers contributed 13 whitepapers to the ReNeW Themes I and II joint meeting held last week at General Atomics. Seven oral presentations were given by NSTX/NHTX researchers including: "Research Thrust on Advanced Plasma Fuelling" by R. Raman (Univ. Washington), "The cross-theme impact of a long-pulse, high-heat-flux, hot-wall research thrust" and "Requirements for a Confinement Device with a Goal to Develop Tritium Breeding Blanket Modules, Based on FESAC Fusion Development Path Plan" by R. Goldston, "Cross-cutting Research Needs for Stability and Steady-State Control" by S. Sabbagh (Columbia Univ.), "Contributions of NHTX to high-performance steady-state plasma development" by J. Menard, "Development of X-ray sensors and optical light extractors for DEMO operation and control" by D. Stutman (JHU), and "Benefits of moderate 3D fields in Tokamaks - NHTX as an example" by N. Pomphrey. Jon Menard also led the discussion session of the "Joint panel on off-normal plasma events" during which the community provided input on the research elements on the three thrusts proposed by the off-normal events panel related to disruptions, ELMs, and MHD-induced energetic particle loss. (J. Menard)

R. Raman (University of Washington) visited UCLA on March 24 and gave the talk "Helicity Injection Applications for Steady-State Reactor Operation". (R. Raman)

Run Coordination (R. Raman , University of Washington, Deputy: E. Fredrickson)

March 30-April 1: Plasma shot development and XP923, "thermal transport in the boundary plasma - R. Maingi" in support of the FY 2010 Joint Research Milestone were run. A heating power scan was conducted at 0.6 MA, 0.45 T in a lower-single null configuration, and a limited Ip scan from 0.6 MA to 0.75 MA. New data were obtained with a fast infrared camera, divertor X-point camera, and the new channels of the divertor bolometer, along with data from standard diagnostics.

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

NSTX completed a two-week maintenance period this past week, installing both LITER evaporators and a portion of the wave-guides for the HHFW balanced power feed upgrade. Both LITER evaporators are loaded with lithium, have been baked, and cycled via their control systems through the full range of travel into the vacuum vessel. Control cables and air lines for the two Lithium Droppers and the new Sample probe were installed and tested, and are awaiting the installation of those devices. Also this week, calibrations of the NSTX vacuum vessel pressure gauges were completed, and measurements of the vessel pumping speeds and intrinsic outgassing rates were taken. A vacuum vessel boronization will be performed over the weekend before the start of plasma operations on Monday morning. The NSTX Test cell will be in restricted access this coming week during plasma operations. Limited access will be available after 5PM each evening.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

• Liquid Lithium Divertor (LLD) (M.Viola)

A teleconference was held with SNL and PPPL to discuss LLD progress and planning:

SNL Status:

- The molybdenum coating vendor will coat samples 4/13/09. NSTX will then evaluate the samples 4/14/09-4/20/09.
- NSTX engineers M. Viola and H. Schneider visited SNL to review the Control Rack assembly, and discuss the wiring layout, and software programming progress.

PPPL Status

- Vacuum outgassing of the 325W LLD heaters was measured and found to be acceptable for NSTX vacuum conditions. Preparations are in progress to test the thermal response and vacuum outgassing of 470W heaters.

• Lithium Evaporator - LITER 2009

- LITER-F and LITER-K vacuum enclosures were baked with the TIV closed. (J. Winston)
- During the LITER vacuum enclosure bakeout, the ovens were heated to 240°C to melt and outgass the lithium loads. (H. Schneider)
- Controls testing was performed. (M.Cropper, H. Schneider)

• Lithium Dropper (D. Mansfield)

- Lithium Dropper unit-2 assembly was completed and vacuum testing is in progress.

• Edge Sample Probe (C. H. Skinner)

- Laboratory testing prior to final assembly and installation was completed
- The probe was installed on NSTX, baked out, and the TIV opened.
- The probe was inserted into NSTX and it was found that additional alignment was not required.
- The samples were loaded and exposures (XP911, C. Skinner) are in progress.