

## **NSTX Weekly Report (Jan. 27, 2006)**

FY2006 weeks of research operations

Planned: 11 weeks

Completed: 0 weeks

There will be an NSTX Physics meeting on Monday, 1/30 at 1:30 in LSB318. Steve Scott will talk about the Alcator C-Mod run plans and collaboration opportunities. (S. Kaye)

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

The NSTX outage continued this past week with the completion of the machine area "scrubs" in preparation for the start of integrated system power testing. Vacuum vessel leak checking following the vessel bake has been completed, as well as the hydrostatic testing of the coil system cooling paths. Pre-operational testing of the hardwired interlock, fault detection, and emergency stop systems is in progress. The cool-down of the neutral beam cryogenic systems is complete, and conditioning of the neutral beam ion sources has begun.

Access to the NSTX test cell will be limited during 1st shift this coming week due to coil system insulation testing and diagnostic calibrations. Daily access restrictions will be announced in the morning meeting notes. (A. von Halle)

### **Research Operations (M. Bell)**

#### **Diagnostic Operations (R. Kaita)**

- Calibration data were taken with the NSTX infrared cameras during the heating and cooling phases of the bakeout. Their analysis is in progress.
- The air and water lines that were installed for cooling diagnostics during bakeout were removed. Shields and other diagnostic components that had to be removed for bakeout are being remounted.

#### **Boundary Physics Operations (H. Kugel)**

- A "Peer Review for LITER-1 Controls" was declared a success, pending resolution of 1 Chit, pertaining to facilitating COE procedure. The "NSTX LITER Installation Procedure for Computer Controls and Cabling" was started and is nearing completion. The submitted LITER Offline Test Lab NEPA Form, Job Hazards Analysis (JHA), and Operating Procedure (OP) revisions continued under review. The submitted NSTX LITER Safety Assessment Document (SAD) continued under review. The review of the NSTX LITER JHA by ES&H was completed and it was found to be satisfactory. Installation of the cartridge

heaters and the ancillary connections continued in progress. The assembly of the outboard utility feedthroughs and their power, instrumentation, and helium connections was started and is in progress.

### **Physics Analysis (S. Kaye)**

- The plasma current quench rate during a disruption is a key parameter for estimating halo current forces and other potentially damaging effects of disruptions in burning plasma experiments such as ITER. To better understand the scaling of the maximum quench rate, current quench data has been analyzed for over 15000 NSTX discharges. Data for the 200 fastest quenching discharges has been analyzed in more detail, and indicates that very few discharges (less than ten) have average quench rates exceeding 0.4GA/s, i.e. minimum characteristic decay times are several ms for nearly all discharges. Consistent with standard aspect ratio tokamak experience, the minimum normalized quench time appears to be independent of plasma current ( $I_p$  range = 0.4MA-1.2MA for NSTX). This data has been contributed to the ITPA disruption database for discussion at the upcoming ITPA-MHD meeting in Japan in early February. (J. Menard)
- David Mikkelsen ended his visit to GA by speaking with Ron Waltz and Jeff Candy concerning the GYRO simulations of NSTX which exhibit 'turbulence draining'. They developed a plan for a convergence study with higher resolution that will test the reliability of the very striking initial result. (S. Kaye)