

## NSTX Weekly Report (August 12, 2011)

**FY 2011 NSTX plasma operations started on October 4, 2010**

**FY 2011 NSTX Outage started on October 25, 2010**

**Planned Run Weeks: 14 run weeks**

**Run Weeks Completed: 4.21 run weeks and 839 plasma shots**

Several NSTX participants gave talks and posters at the PFC meeting in Oak Ridge from Aug. 10-12. H. Kugel (PPPL) gave a talk "NSTX liquid lithium divertor (LLD) results", R. Maingi (ORNL) presented a talk "The Continuous Improvement of H-mode Discharge Performance with Progressively Increasing Lithium Evaporation in NSTX," and M. Jaworski (PPPL) presented "Progress in empirical plasma reconstruction of the NSTX divertor." T. Rognlien (LLNL) presented "Analysis of alternative divertor designs for reducing peak heat flux operation," which focused partly on snowflake divertor operation and modeling in NSTX. Also, J. Brooks (Purdue) presented a talk "PFC sputtering-response modeling for NSTX, C-Mod, and DIII-D", and R. Nygren (SNLA) presented a talk "Thermal analysis of broadening of peak heat flux profile in NSTX". In addition there were several NSTX related posters, "Lithium-graphite research on NSTX" (C.N. Taylor, Purdue) and "Integration of the materials analysis particle probe (MAPP) in NSTX" (B. Heim, Purdue). (R. Maingi)

R. Maingi (ORNL) presented a seminar at the NE dept. at UT-Knoxville: "How changing the wall material improved discharges in the NSTX." (This was presented on 8/11/11). (R. Maingi)

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

Investigations into a turn-to-turn fault that occurred in the TF magnet inner conductors continued this past week with electrical insulation measurements (Meggers) and cooling path hydrostatic tests of the un-faulted conductors. Methods to expose the faulted area (dissection, excavation, or conductor removal) are being considered. Engineering schedules have been developed for three possible repair/rebuilds of the TF inner bundle and are now under review. These will be compared with the possibility of moving directly to the NSTX upgrade with its superior design characteristics.

Also this week, testing of the new Switching Power Amplifier (SPA) was performed, successfully using the new Plasma Control System pre-programmed algorithm to control all six SPA subunits (individually powering the six RWM error field coils) via the power supply real time controls. A neon glow was performed this week for CHERS/FIDA diagnostic calibrations.

Access to the NSTX test cell is expected to be available this coming week.

### Research Operations (M. Bell)

#### Physics Operations (D. Muller)

The basic software modifications to the Plasma Control System (PCS) for operating and controlling the second 3-channel switching power amplifier (SPA-2) were completed and tested this week. Independent control by the PCS of the currents in the six error-field correction coils was demonstrated. The software to provide real-time error field control and mode proportional

feedback using all six supplies is now being tested and modifications to the state-space controller algorithm for the resistive wall mode are underway. (S. Gerhardt)