

NSTX Weekly Report (Apr. 8, 2005)

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

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

- Martin Peng (ORNL) attended a Fusion Energy Science Advisory Committee (FESAC) meeting during April 7-8, 2005. (M. Peng)
- Kyron Williams has joined NSTX as a postdoctoral research fellow. He will be working on turbulence studies using the gas puff imaging diagnostic. (R. Kaita)
- There will be NO Physics Meeting on Monday, 4/11
A tentative future physics meeting schedule is as follows (S. Kaye):
 - Monday, April 18: Eric Fredrickson – Fast Ion MHD/Confinement, Stewart Zweben – Edge Turbulence and Transport
 - Monday, April 25: Rajesh Maingi – Multi-machine ELM Study, Chuck Kessel – Steady-state Scenarios
 - Monday, May 2: Sid Medley – MHD and Fast Ion Confinement, Dave Gates – Effect of Strong Shaping on Stability and Transport
 - Monday, May 9: Fred Levinton – Current Profile Measurements, Michael Bell – Particle Fueling/Inventory or Neoclassical Effects on Charge-Exchange Spectra

Physics Analysis (S. Kaye)

E. Kawamori of Univ. of Tokyo presented results of his work on equilibrium reconstruction with ion flow included. His equilibrium calculations are based on a 2-fluid approach, which he indicates is necessary because of large ion kinetic effects in NSTX. The calculation is set up to accept plasma density and coil currents as inputs, with flux surfaces, temperatures, current profiles and rotation profiles as output. The model was applied to an NSTX discharge, but comparisons with CHERS data could not be made for that particular profile. He will be performing additional calculations for discharges for which CHERS data is available. Future development work will involve restructuring the calculation in order to accept the various measured quantities (temperatures, total current, rotation velocity) as input.

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

NSTX Integrated system power testing began this past week after the completion of the safety interlock and Emergency Stop system testing, and the end-to-end resistance and insulation checks of the machine coils and power supplies. Early in the power testing, a turn-to-turn flashover occurred in an outer TF leg during the current rise of a modest TF pulse (20kA). The fault detection

system worked as expected, and the fault energy was limited to 8kJ. There was no fault to ground. The real-time TF joint and inner bundle telemetry indicate that the joints and bundle performed as expected for a single outer turn to turn fault. The cause of the failure was determined to be a degradation of the turn-to-turn insulation. The faulted insulation has been removed, and new insulation was applied and tested over the weekend. Integrated system power testing is expected to resume early this week, followed by plasma operations.

In addition to the resumption of plasma operations this coming week, a Rayleigh scattering calibration of the MPTS, and a neon glow calibration of the CHERS diagnostics are scheduled for this coming week. There will be no access to the NSTX test cell during coil power testing and plasma operations during the 1st shift this coming week. In addition, the run day will be extended to 7PM on Tuesday for full power operations, and to 7PM on Thursday for the neon glow. The test cell will be in controlled access each evening from the end of run day until 10PM. 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)

- Special supersonic nozzles for off-line testing of SGI concepts were received. (V. Soukhanovskii, LLNL)
- Carbon and boron materials for fabricating injection pellets for electron diffusion and flow experiments were received.

Diagnostic Operations (R. Kaita)

- Testing of the diagnostic torus interface valves and shutters in preparation for plasma operations is complete.
- Additional mylar sheets were placed around the plasma current Rogowski coils to provide more high voltage isolation between them and the NSTX vacuum vessel.