

NSTX Weekly Report (Oct. 23, 2009)

FY 2010 NSTX plasma operations

Planned: TBD run weeks

Completed: 0 run week and 0 plasma shot

• Gary Taylor visited the Culham Science Centre in England from September 14 to 24 to participate in electron Bernstein wave (EBW) plasma startup experiments using a 350 kW, 500 ms 28 GHz gyrotron from Oak Ridge National Laboratory that was recently installed on MAST. Experiments were aimed at reproducing and extending experiments conducted in 2007 with a shorter pulse, lower power gyrotron. Plasma performance was limited by arcing in the transmission line between the gyrotron and MAST, so that while heating, current and closed flux surfaces were generated, plasma performance did not reach the level attained in the 2007 experiments. Modifications are being made to the transmission line and further experiments are planned for later this year and in 2010. While visiting Culham Gary presented a talk on recent results from NSTX HHFW experiments and attended the MAST Research Forum. (G. Taylor)

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

The NSTX outage continued this week with the ongoing in-vessel fit-ups and installation of the Liquid Lithium Divertor (LLD) trays. The first tray segment is fully installed, and the heater cabling for that tray has been routed to the vessel feedthroughs. The LLD tray installation procedure has been modified with lessons-learned from the initial tray, and the installation of the second tray is in progress. In parallel with this work, time was taken to install in-vessel components for the BES diagnostic. Also this week, installations of electrical tray-work for both the LLD and the BES diagnostic continued, along with the fit-ups of the external cooling lines for the LLD. The machine's TF joints are now being reassembled after the successful completion of inspections/testing.

The NSTX test cell will be in free (card reader) access this coming week.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- Liquid Lithium Divertor (LLD)
 - The first LLD plate was fully installed.
 - The installation of the 2nd LLD plate started.
 - The assembly of the 3rd LLD plate was completed.
 - The assembly of the 4th LLD plate is in progress.
 - The installation of the external cooling lines started.
 - The installation of the cable trays for the LLD continues.
 - Remote desk top capability is being used to test LLD control software on Control Rack.
- LLD Diagnostics
 - The CCD camera for enhanced LLD spectroscopy was received and passed initial inspection.
 - A requisition was submitted for materials to fabricate reentrant lower divertor region, fast

camera viewports.

- Lithium Evaporator (LITER2009)
 - Planning was completed for proceeding with dissection of the ovens to examine internal conditions.
- Edge Sample Probe
 - A trial fit-up of the installation of the Sample Probe at Bay-K was performed.

Diagnostic Operations (R. Kaita)

- A schedule for pre-run diagnostic calibrations is being prepared. They will be conducted during the latter part of November and the beginning of December, and include an extended period of neutron calibrations.
- A new solid-state source for the high-k turbulence diagnostic is being tested. While the power is considerably lower than the output of the backward-wave oscillator presently in use, initial measurements through the transmission line to NSTX suggest that it may be adequate. Further tests with microwave propagation through the vacuum vessel are planned.