

NSTX-U Weekly Report (September 13, 2013)

NSTX-U is in the Upgrade Project outage in FY 2013

A number of NSTX and NSTX-U related talks were presented at the PFC meeting at ORNL on Sept. 11-13. M. Jaworski (PPPL) presented "Materials and PFCs R&D in the NSTX-U program." R. Maingi (PPPL) presented "The dependence of discharge performance on pre-discharge lithium evaporation in high triangularity H-mode discharges on NSTX". J-W. Ahn and T.K. Gray of ORNL presented "Heat flux width study for ELM-free and ELMy H-mode plasmas in NSTX." T.D. Rognlien (LLNL) presented "Particle and heat fluxes to PFCs during snowflake divertor operation." (R. Maingi)

In addition to attending the PFC meeting, NSTX-U scientist Mike Jaworski (PPPL) and Princeton University PhD-candidate Tyler Abrams attended the 4th International Workshop on Plasma-Material Interaction Facilities. Tyler Abrams presented the talk, "[Erosion and re-deposition of Lithium coatings on TZM molybdenum and graphite during high-flux plasma bombardment](#)" based on experiments conducted at the Magnum-PSI linear plasma device at FOM-DIFFER in the Netherlands. One key finding of the work was that under the divertor-like plasma conditions in the Magnum-PSI device, the total erosion yields derived from optical emission spectroscopy and Thomson scattering measurements were found to be much lower than might be calculated from Langmuir-law evaporation into vacuum. These latter evaporation rates have long been used as a baseline for estimating temperature limits of liquid lithium PFCs and these new measurements indicate those temperature limits may require revision. (M. Jaworki)

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

NSTX Upgrade construction activities continued with the lift of the TF inner bundle into the VPI mold, and the sealing/pump down of the mold in preparation the vacuum impregnation with epoxy (VPI) scheduled for next week. The mold will be lifted into the bake-out oven over the weekend. The mounting of sensors on center stack tiles continues to make good progress in the diagnostic shop. As completed, the tiles are being moved over to the CS High Bay for storage and subsequent mounting on the center stack casing. For the second neutral beam, hydrostatic testing of the newly installed NB2 High Voltage Enclosure (HVE) cooling lines is scheduled for next week. Testing of NB2 Ion Source/Ion Dump cooling lines is scheduled for the following week. Contractors are on-site to begin the installation of new NB2 power cabling.

Preparations for plasma operations in the NSTX-U configuration also continued with the maintenance of the exiting power supply and distribution equipment for the neutral beams. A crane was brought on site this week, and an autotransformer for NB2 was replaced with a spare unit.

Access to the NSTX test cell will be available only through previous arrangement with the Upgrade Work Control Center.