

## NSTX-U Weekly Report (Oct. 26, 2012)

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

The Transport and Confinement ITPA meeting was held Oct. 15-17, 2012, after the end of the IAEA meeting, at the Marriott La Jolla Hotel, CA. Attending for NSTX-U were S. Kaye, W. Guttenfelder and Y. Ren of PPPL. Major topics of discussion for the meeting included the Limit Cycle Oscillations associated with L-H transitions, transport and other results of the JET ILW experiments for assessing the ITER plan of having a W divertor on Day 1, profile stiffness, impurity transport and summaries of Joint Experiments and Activities. There were also breakout sessions for small group discussions. W. Guttenfelder gave a presentation on his TC-15 work on determining modes that cause momentum transport in NSTX, and S. Kaye gave a summary of the BES observations on NSTX. This summary was based on D. Smith's IAEA presentation. S. Kaye, W. Guttenfelder and Y. Ren discussed collaborative work on MAST with M. Valovic, A. Field and C. Roach, as well as the disposition of TC-12, in a breakout session. The MAST folks welcomed the ideas for momentum and particle transport experiments by the NSTX-U group. (S. Kaye)

R. Maingi (ORNL) and A. Diallo (PPPL) attended the pedestal and edge physics ITPA group meeting in San Diego, CA, from Oct. 15-17. Diallo presented a talk, "Characterization of pedestal fluctuations during the ELM cycle on NSTX". Diallo also presented preliminary analysis on the same subject on Alcator C-Mod. (R. Maingi)

E. Fredrickson, Nikolai Gorelenkov and Guoyong Fu of PPPL presented papers at the 9<sup>th</sup> Meeting of the ITPA Energetic Particle Topical Group held in San Diego from October 15-17. New experimental and theoretical results were presented on fast ion driven instabilities, fast ion redistribution and benchmarking of codes for modeling the experimental results. E. Fredrickson reported on "*An update on further benchmarking of NOVA/ORBIT against NSTX TAE data and losses*" and Nikolai Gorelenkov presented a report on "*Validation of quasilinear models for fast ion relaxation due to Alfvén Eigenmodes for burning plasmas*". Ultimately these codes will be used to predict the stability of ITER to fast ion driven instabilities and their affect on fast ion confinement. These predictions will help guide ITER towards more efficient operational regimes. The meeting ended with discussions on what tasks could be considered closed, what remained to be done on unfinished tasks and the choice of new tasks. (E. Fredrickson)

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

NSTX Upgrade construction activities continued this week with the ongoing fit-up and welding of new umbrella legs. Scaffolding has been removed and shielding put in place at bays J-K in preparation for cutting the vessel and installing the new bay J-K vessel flange. That flange, which will provide the NB2 to NSTX vessel interface, has successfully passed vacuum leak checking and is in the final stages of metrology and as-built drawing corrections before installation. All TF inner conductors have been installed in the 1st inner TF quadrant mold, which is now being prepared for vacuum impregnation with epoxy (see the attached figure).

Preparations of non-upgrade equipment for plasma operations in the NSTX-U configuration also continued with the ongoing testing of the prototype fault detector in conjunction with the new firing generator in a field coil power conversion rectifier. All fault detector faults have been

cleared, and power supply permissives (control power only) have been established. Section currents are being simulated to generate trips.

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

## **Center Stack –First Inner TF Quadrant Assembly** **Insulated Conductor Bars Being Placed into Quadrant Mold**



**Ninth bar successfully placed in the quadrant mold!**  
**Oct 22, 2012**