

## NSTX-U Weekly Report (April 25, 2014)

### **NSTX-U is in the Upgrade Project outage in FY 2014**

The NSTX-U Team Meeting was held on April 25, 2014. The presentations are available on [http://nstx.pppl.gov/DragNDrop/NSTX\\_Meetings/Team\\_Meetings/2014/04\\_25\\_2014/](http://nstx.pppl.gov/DragNDrop/NSTX_Meetings/Team_Meetings/2014/04_25_2014/). One important note is that the schedule for the in-vessel work continues through mid-June 2014, so please plan accordingly (see the Engineering Operation Update). **Please also note that since we are not planning any vacuum vessel entry after the CD-4 in December, this period before Mid-June maybe the only chance you have for the in-vessel access until the end of the FY 2015 research run (~ September 2015). If you are expecting any in-vessel activities which are not already on the NSTX-U work planning list, please contact M. Ono or other NSTX-U managers immediately.** (M. Ono, PPPL)

Several PPPL/NSTX-U scientists made presentations at the TTF meeting in San Antonio, TX from Apr 21-25, 2014. S. Gerhardt presented a plenary talk "Recent research on high confinement, stationary ELM free operating scenarios for ITER and beyond", including highlights of the NSTX contributions on Enhanced Pedestal H-mode scenarios. Y. Ren presented an oral "Experimental observation of high-k turbulence evolution across the L-H transition in NSTX". M. Podesta presented an oral "Development of a new reduced fast ion transport model in TRANSP". W. Wang presented an oral "Roles of low-k turbulence in spherical tokamak plasma transport." D. Russell (Lodestar) presented an oral "Modeling the effect of lithium on SOL dynamics and the SOL heat flux width observed in NSTX." NSTX posters were present by D. Battaglia, J. Chowdury (University of Colorado), W. Guttenfelder, R. Maingi, Y. Sechrest (University of Colorado), and D. Smith (University of Wisconsin). (R. Maingi)

Dr. Yeong-Kook Oh, Director of the Fusion Engineering Research Center at NFRI, and a team of electrical and mechanical engineers from the KSTAR superconducting tokamak device met with Steve Sabbagh and Young-Seok Park of Columbia University and Raki Ramakrishnan, Jon Menard, and Masa Ono of PPPL at PPPL on April 22<sup>nd</sup>-23<sup>rd</sup> to discuss final details of a new high-bandwidth power supply and circuitry to be used to support research in several 3D physics topical areas on KSTAR as part of an ongoing NSTX-U/KSTAR collaboration. (S. Sabbagh)

R. Kaita (PPPL) gave a seminar entitled "Addressing the First Wall Challenge for Magnetic Confinement Fusion in the National Spherical Torus-Upgrade" at the Institute for Research in Electronics and Applied Physics at the University of Maryland at College Park. The presentation included a summary of lithium behavior in the NSTX Liquid Lithium Divertor, and the implications of recent high heat flux experiments with thin lithium films on candidate NSTX-U plasma-facing components. These results were also discussed with collaborators during a visit to Johns Hopkins University. (R. Kaita)

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

NSTX Upgrade activities continued with the ongoing winding of the new OF coil's 4th and final layer of conductor. The new centerstack casing has been stood up inverted in the south high bay and it is ready for PF coil installations (see photo below). Welding of the PF1b coil can has been completed, and electrical tests will be performed before it's moved to the south high bay to be installed on the center stack casing. The new PF1A lower coil has been vacuum impregnated

with epoxy (VPI) at the manufacturer's facility. In the NSTX-U vessel, NB Armor has been installed and the armor telemetry tested.

Digital Coil Protection System (DCPS) phase I testing continued this week using the internal Autotester. Input files to challenge the DCPS software continue to be generated. Hardware and I/O layout and design continues.

Preparations of non-upgrade equipment for plasma operations in the NSTX-U configuration also continued with the preparations of the Field Coil Power Conversion (FCPC) and Neutral Beam Power systems for upcoming power testing. Commissioning of the new TF and OH PLC based fault relaying system continued, and the 350HP FCPC cooling water pump has been removed for repair. Procedures to install the new HHFW antenna compliant center conductors have been reviewed and approved, and that work is scheduled for the first to weeks of June. The analog links for the new Ip Calculator are being tested.

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