

## **NSTX-U Weekly Report (June 26, 2015)**

### **NSTX-U is in the Upgrade Project outage in FY 2015**

A Lithium Safety Peer Review was held at PPPL on June 16 – 18, 2015. The review was part of a U.S. Department of Energy “notable outcome” for the Laboratory for fiscal year 2015. The four reviewers were Robin Izzo, director of Environmental Health & Safety at Princeton University, Thomas Lin, a senior research associate emeritus at Penn State University, Steven Pawel, a senior research staff member in the Corrosion Science & Technology Group at Oak Ridge National Laboratory, and Dennis Youchison, a distinguished member of the technical staff at Sandia National Laboratories. The reviewers visited PPPL facilities that included the NSTX-U Test Cell and areas for lithium technology development and storage. They also examined lithium handling procedures, and interviewed members of the staff who work with lithium. The reviewers observed that PPPL personnel and their safety practices were appropriate and adequate for present lithium-related activities. They also concluded that significant facility upgrades and safety improvements were required in the long term. These are needed to develop complex systems like the flowing liquid lithium divertor for NSTX-U, which will have a much higher lithium inventory than current used at PPPL. (R. Kaita, PPPL)

### **Experimental Research Operations (S. Gerhardt, R. Kaita)**

Good progress on commissioning and alignment of the Multi-Pulse Thompson Scattering (MPTS) diagnostic. The Nd:YAG laser beams were brought from the laser room into the Test Cell and up to the vacuum window on the laser input flight tube. Various optical elements in this part of the beam path were adjusted in preparation for passing the beam through the vacuum vessel. (B. Stratton, PPPL)

The new support brackets for the Lithium Evaporators (LITERs) have been permanently welded to the upper umbrella structure. A review of the NSTX-U Experimental Machine Proposal (XMP) for the Lithium Granule Injector (LGI) revealed the need to prevent injection of granules in the absence of plasma. It was decided that the most straightforward interlock scheme would be to have the Plasma Control System (PCS) provide a permissive signal to the LGI control system. (R. Kaita, PPPL)

The design of the stand and flight tube of the divertor SPRED diagnostic has been completed. Work orders have been submitted to our shops. A test fit of the receiver box for the Synthetic Aperture Microwave Imaging [SAMI] diagnostic was performed this week at Bay "I" mid-plane. No interferences were observed. Locations for tapped holes in the mounting ring were established. A trial fit of one of the UV detector mounts at bay "E" mid-plane was performed. Modifications to the stand and some of the detector supports that will be required for clearance with the HHFW transmission lines were identified. Welding of the re-entrant tube and window assembly of the Divertor Tangential Imaging diagnostic is in progress in our shops. Fabrication of mounting brackets for infrared cameras is in progress. A work request for the support frame of the outer TF Rogowski coil has been submitted. (R. Ellis, PPPL)

### **Engineering Operations (A. von Halle, P. Titus)**

Recovery from an external arc fault at the Ohmic Heating (OH) coil terminals continued this past

week. The OH compression ring assembly and new cooling tube supports were installed yesterday (see photo below), and electrical engineering inspections have been completed. Final inner divertor cooling tube installations and hydrostatic tests are being performed before the start of TF flex bus re-installations. A new procedure for the in-situ verification of high current bolted joint has been reviewed/approved, and will be conducted as sections of the TF bus connections are made. The OH coaxial connection assembly is ready for installation and in-situ epoxy potting. Final dummy load tests of the OH Rectifiers were completed this week, including test shots to exercise recent updates to the Power Supply Real Time Control (PSRTC) system. This completes all testing of the rectifiers for the NSTX-U coil systems. The Switching Power Amplifiers (SPA's) used to power the Resistive Wall Mode (RWM) coils will be tested in mid-July. A Conceptual Design Review for the future installation of High Z tiles at the outboard divertor was held this week.

Access to the NSTX-U Test Cell is expected to be available this coming week. Access must be arranged through Work Permits approved by the D-Site Shift Supervisors.

### **Repaired / Improved NSTX-U Upper OH Feed Area Reassembly of TF magnet is starting (June 22, 2015)**

