

## NSTX-U Weekly Report (September 16, 2016)

### **FY 2016 NSTX plasma operations completed Completed: 10.06 run weeks and 1066 plasma shots**

The paper “Massive Gas Injection Valve Development for NSTX-U”, by the University of Washington team members, R. Raman, G.J. Plunkett, and W.-S. Lay, IEEE Transactions on Plasma Science, Vol. 44, Issue 9, Sept (2016), DOI10.1109/TPS.2016.2565658 was published on-line, <http://ieeexplore.ieee.org/document/7478049/>. The paper summarizes the design and off-line experimental results from the operation of a "ITER-Type" MGI valve. Two of these valves have now been commissioned on NSTX-U. The paper also describes operation of the valve in 1T ambient magnetic fields. (R. Raman)

The NSTX-U Team Meeting was held on September 15, 2016 at PPPL. The NSTX-U team was updated on the on-going outage activities and the near and longer term plans. The meeting material is available on the web at:

[http://nstx.pppl.gov/DragNDrop/NSTX\\_Meetings/Team\\_Meetings/2016/2016-09-15/](http://nstx.pppl.gov/DragNDrop/NSTX_Meetings/Team_Meetings/2016/2016-09-15/). (M. Ono, J. Menard, PPPL)

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

Lockout / Tagout of all hazardous energy sources in preparation for the NSTX-U vacuum vessel entry were completed this past week, and the Neutral Beam #1 torus duct and spool piece were removed. Pre-Job briefs and Health Physics reviews were then completed before issuing the Confined Space Permit for the initial vessel entry for inspections and photographs. In-vessel diagnostic calibrations will begin this coming week. Radiography of the damaged PF1aU coil has been completed, and radial locations of possible voids in the conductor have been identified. The coil is in our shop being prepared for dissection and borescope inspections as part of the ongoing forensics. Engineering plans and schedules for the removal of the NSTX-U center column to allow for the redesign and replacement of both the PF1a Upper and Lower coils are now in place. Coil mandrels are being fabricated, and the required coil conductor is on order. Set-up of the coil winding facility continues. Also this week, Field Coil Power Conversion (FCPC) systems were successfully used for magnetic testing of an ITER X-Ray Detector diagnostic. This FCPC test stand will be used later this year for power testing of the new PF1a coils.

Access to the NSTX-U Test Cell is expected to be available for approved work this coming week.

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

The initial entry into the NSTX-U vessel was accomplished on 9/16. Three tiles, four quartz microbalance crystals, and 23 Si witness coupons were retrieved for material analysis and a complete set of photographs of the vessel interior was taken. (C. Skinner, PPPL)

On 9/1, the final design review for the NSTX-U Bay-I and Bay-J divertor viewing resistive bolometers was completed. These systems will allow the radiated power from the lower divertor to be measured. Long-lead time items have already been procured and following the

resolution of minor CHITs, fabrication of the new pinhole cameras will begin. These diagnostics are scheduled to be installed for the next NSTX-U operational campaign to support a range of boundary research activities.

On 9/8 and 9/9 the NSTX-U infrared video bolometer prototype was installed on Alcator C-Mod with the help of Jim Terry (MIT) and the C-Mod vacuum team. It was able to utilize an existing, installed IR camera at C-Mod and measurements were made during Ohmic and RF-heated H-mode and I-mode plasmas. Results will be useful in scoping future designs of IRVB technology for NSTX-U. (M. Reinke, ORNL)