

## **NSTX-U Weekly Report (May 17, 2013)**

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

An article by Dennis Mueller (PPPL) "The physics of tokamak start-up" has been published online, 10 May 2013, in Physics of Plasmas (Vol.20, Issue 5): URL: <http://link.aip.org/link/?PHP/20/058101&aemail=author> DOI: 10.1063/1.4804416. The paper describes Tokamak start-up on present-day devices using inductive start-up, sometimes assisted with auxiliary power from electron cyclotron radio frequency heating. The design of a spherical tokamak (ST) with DT capability for nuclear component testing would require an alternative to a central solenoid because the small central column in an ST has insufficient space to provide shielding for the insulators in the solenoid. Alternative start-up techniques for the ST such as induction using outer poloidal field coils, electron Bernstein wave start-up, coaxial helicity injection and point source helicity injection are described. The paper is based on D/ Mueller's tutorial talk at the 2012 APS-DPP meeting. (D. Mueller)

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

NSTX Upgrade construction activities continued with successful electrical insulation tests (HiPots) and hydrostatic testing of the completed third TF inner quadrant. TF conductors for fourth and final quadrant are being primed, baked and taped in preparation for being installed in the VPI mold.

Preparations of non-upgrade equipment for plasma operations in the NSTX-U configuration also continued with the power testing of the new firing generators for the field coil power conversion (FCPC) system rectifiers. Ten of the planned thirty four firing generators have now been delivered to FCPC, seven of which have successfully completed power testing. The AC Power group is processing oil and maintaining the three autotransformer and transformer rectifier sets that will provide the primary power for the NB2 ion sources. A problem with an autotransformer winding was detected during internal inspections, and that unit will be pulled from the line-up for replacement/repair.

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