

## **NSTX-U Weekly Report (December 23, 2016)**

**FY 2017 status: NSTX-U is in a maintenance and repair outage.**

### **NSTX-U Research (J. Menard)**

The paper “Snowflake Divertor Experiments in the DIII-D, NSTX, and NSTX-U Tokamaks Aimed at the Development of the Divertor Power Exhaust Solution” by V. A. Soukhanovskii et. al. was published in IEEE Transactions on Plasma Science (Volume: 44, Issue: 12, Dec. 2016, p. 3445; DOI: 10.1109/TPS.2016.2625325). The manuscript was based on material presented in an invited talk at the Symposium of Fusion Engineering 2015. The paper summarized experimental results obtained in NSTX and DIII-D: divertor heat flux reduction, radiation distribution and full power detachment in the radiative snowflake divertor, effects on pedestal profiles and ELM energy, and significant divertor surface peak temperature reduction during ELMs. Magnetic equilibria, divertor transport and radiative divertor modeling results for NSTX-U support the snowflake divertor configuration as a leading divertor heat flux mitigation scenario for 2MA, 12 MW NBI-heated H-mode plasmas.

### **NSTX-U Recovery Project (R. Hawryluk)**

The recovery project Responsible Engineers continued preparing System Design Descriptions (SDDs) this week. Significant progress on developing draft SDDs has been reported. Several engineers made a trip to Fermi National Accelerator Laboratory to tour their coil winding facility and discuss the possibility of future support for the NSTXU Recovery Project. Magnet fabricator Everson Tesla visited PPPL this week to discuss details of coil fabrication with representatives from PPPL.

The lift and removal of the PF1aL coil from the centerstack casing was completed this week (see photo on right). The microtherm was removed from the central solenoid enabling access to the coil.

The Field Coil Power Conversion (FCPC) Test Stand is being reconfigured for power testing of PF Inner Coils, and a test procedure is out for review. Preparations for the removal of the lower ceramic break from the vacuum vessel continue. Recommissioning of the coil winding facility continues with vacuum leak checking of the VPI system, and the fabrication/commissioning of tensioning system and the roller assembly. Hydrostatic testing of the first spare neutral beam (NB) ion source has identified an internal water leak which will now be addressed. A new optical alignment fixture has been set up in the NB source shop to align the accelerator grids of the next ion source in assembly. Another ion source is in the Decon Facility for disassembly and cleaning.

