

NSTX-U Weekly Report (April 17, 2015)

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

A review paper entitled “Recent progress on spherical torus research” by Masayuki Ono and Robert Kaita (PPPL) was published online in Physics of Plasmas 22, 040501 (2015) on April 15, 2015. The paper reviews the scientific progress made by the worldwide ST research community during the NSTX-MAST mega-ampere-ST era (i.e., 2000 – 2014). It also covers the program elements of the on-going upgrades to the NSTX and MAST facilities as well as the ST contributions to the fusion energy development path. The AIP Publishing LLC has made available the manuscript, as part of on-going commitment to increase the visibility and impact, for a period of 30 days following its publication online. It may be accessed via the link: <http://scitation.aip.org/content/aip/journal/pop/22/4/10.1063/1.4915073>. (M. Ono)

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

As indicated in the Engineering Operations report below, the integrated systems test procedure (ISTP) single coil pulses are also of value for magnetic calibration purposes. The polarity of all new magnetic sensors on the center stack has been determined and adjusted based on these pulses, and sensors calibrations are beginning. The magnetic reconstruction codes LRDFIT and EFIT have both been used, and are providing critical information for required troubleshooting. While the ISTP is being run from the dedicated power supply control software, additional codes are required in order to provide coil current control during plasma operations. These codes are being tested in the background during ISTP pulses, in order to ensure that they will be ready when called upon.

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

Preparations for NSTX-U plasma operations continued this week with the completion of the vessel center-stack bake, and the configuration of the field coil power supplies for the testing of the NSTX-U magnets. Coil cooling water system flow switches have been calibrated, power system interlocks and coil polarities have been verified, and electrical insulation tests (Hi-Pots) of all coils and bus work have been completed. Integrated system power testing is now in progress for the TF, OH, PF3U/L, PF5, & PF1CU/L coils, and magnetic diagnostics are being calibrated. Preparations are underway to perform a resistive load test of the Coaxial Helicity Injection (CHI) system capacitor bank.

The PPPL Safety Certificate defining the limitations and conditions for NSTX-U experimental operations has been approved.

The NSTX-U Test Cell will be in restricted access during 1st shift next week for coil system power testing. Access to the NSTX test cell will be available on second shift only through Work Permits approved by the D-Site Shift Supervisors.