

NSTX-U Weekly Report (April 26, 2013)

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

The text of the NSTX-U 5 year plan for FY2014-18 has been completed by the NSTX-U research team and made available to the 5 year plan review panel. Special thanks to the team for their hard work over the past 1.5 years in putting together the plan. The text is available at the following URL: <http://nstx-u.pppl.gov/five-year-plan/five-year-plan-2014-18> (J. Menard, PPPL)

The lithium granule injector developed on NSTX and installed on DIII-D as part of a DIII-D/NSTX-U collaboration was commissioned at DIII-D, led by Gary Jackson. Granules were dropped into ohmic and H-mode discharges. The timing and amount were varied to confirm controllability and assess effects on the plasma. The lithium was observed on a tangential visible camera with a lithium-1 filter, the MDS spectrometer, SPRED, and CER spectroscopy. There were no adverse effects observed in the plasma and signs of modest recycling reduction. (R. Maingi, PPPL).

Several NSTX-U Team members participated in the ITPA MHD Stability Group meeting, held last week at the Culham Centre for Fusion Energy, UK. Steve Sabbagh (Columbia University) gave two presentations, one to summarize recent work conducted under joint experiment MDC-2 on global instability analysis code benchmarking and joint experimental results, and another proposing a new joint experimental activity on global mode disruption prediction and avoidance. Dave Gates (PPPL) delivered a presentation on the origin of the tokamak density limit. Luis Delgado-Aparicio (PPPL) gave a talk on impurity-induced MHD and the impact of low vs. high-Z plasma facing components. Jong-Kyu Park (PPPL) gave a remote presentation on NTV physics theory and analysis. (S.A. Sabbagh)

R. Maingi (PPPL) attended the ITPA Pedestal and Edge Physics Meeting on 4/22-4/22 in Garching, Germany, and served as Vice-Chair. John Canik (ORNL) presented a talk remotely, "Changes to edge microstability when lithium PFC coatings are applied in NSTX." Ahmed Diallo (PPPL) attended and presented a talk "Direct observations of the onset of a coherent continuous edge instability limiting the pedestal gradient between ELMs", highlighting joint work with Alcator C-Mod. J-W. Ahn (ORNL) presented a talk remotely "Effect of shaping on ELMs and observation of a small ELM regime at KSTAR", highlighting joint work with KSTAR. (R. Maingi)

Charles Skinner (PPPL) and Howard Yuh (Nova Photonics) attended the ITER workshop in First Mirror Surface Recovery on April 23 - 24, 2013 by remote connection. Charles Skinner gave two presentations: the first was "Laser Cleaning of Candidate Diagnostic Mirrors for ITER" and reported results from laser cleaning carbon and beryllium coated mirrors and an initial concept for implementation of laser mirror cleaning in ITER. The second presentation was on "First Mirror and Dust Risk" and outlined strategies and recommendations for mitigating the technical and project risk in these areas. Howard Yuh gave a presentation on "Low Energy Ion Beam Mirror Cleaning" that described a proposal to apply a 2D array of duoplasmatrons to generate a uniform low energy ion beam for ITER diagnostic mirror cleaning. (C. Skinner)

Dr. Pratipalsinh Rayjada from the Institute for Plasma Research in Gandhinagar, India, visited

PPPL during April 22 - 25. His expertise is in materials for fusion applications, and he gave a seminar on his work entitled "Erbium Oxide Coating for Hydrogen Barrier: Process Optimization." India has proposed to develop and test a Lead-Lithium cooled Ceramic Breeder (In-LLCB) concept Test Blanket Module (TBM) for ITER. The erbium oxide coating is intended to create a tritium permeation barrier (TPB) to avoid accumulating tritium in the structural material of the TBM. Dr. Rayjada also had numerous discussions with PPPL personnel on lithium as a plasma-facing component. (R. Kaita, PPPL)

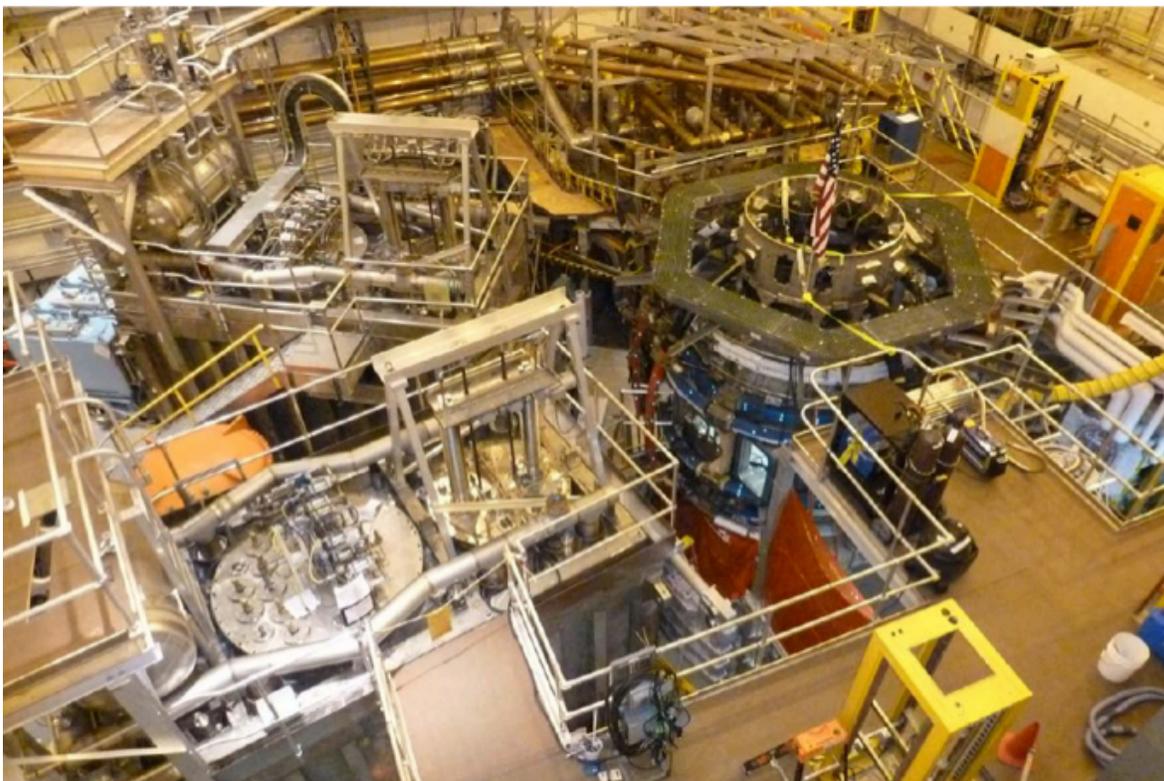
Engineering Operations (A. von Halle, C. Neumeyer)

NSTX Upgrade construction activities continued with the assembly of the conductors and mold for the third TF inner quadrant. The completed mold has been moved into the oven in preparation for vacuum impregnation with epoxy next week. The second of three high voltage enclosure (HVE) containing the power supplies for the NB2 ion sources has been assembled in place in the test cell.

Preparations of non-upgrade equipment for plasma operations in the NSTX-U configuration also continued with the start of power testing of the new firing generators for the field coil power conversion (FCPC) system rectifiers. Six of the planned thirty four firing generators have now been delivered to FCPC.

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

NSTX-U Test Cell Areal View (Mar. 26, 2013)



Newly installed cable tray on the top of the device can be seen.