

NSTX-U Weekly Report (February 27, 2015)

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

The NSTX-U Research Forum for 2015 was held February 24-27, 2015 at the Princeton Plasma Physics Laboratory. The purpose of the Forum is to provide fusion researchers the opportunity to present ideas for experiments to be conducted on NSTX-U in the upcoming run and for theoretical work supporting NSTX-U. An important goal of the Forum is to produce a preliminary prioritization of experiments to be conducted during the research campaign. An overview plenary session was held on the first morning of the meeting and included presentations on: “NSTX-U 2015 Research Program Overview” by J. Menard (PPPL), “NSTX-U facility and diagnostic status” by M. Ono (PPPL), “MAST Upgrade: Status, plans and complementarity with NSTX-U” by A. Kirk (Culham Centre for Fusion Energy), “Status and Plans for DIII-D and General Atomics Collaborative Research Grants in Support of NSTX-U” by R. La Haye (General Atomics), and “Alcator C-Mod – Current status and plans and Collaboration ideas for NSTX-U” by B. LaBombard (MIT). These presentations were followed by presentations on the agendas for the Boundary, Core, and Scenarios Science Groups. The next two days were comprised of Topical Science Group parallel meetings for Pedestal Structure and Control, Energetic Particles, and Advanced Scenarios and Control, Macroscopic Stability, RF Heating and Current Drive, Materials and Plasma Facing Components, Divertor and Scrape-off Layer, Turbulence and Transport, Solenoid Free Start-up and Ramp-up, and the new Particle Control Task Force. In the afternoon of February 26, Science Group Parallel Sessions were held for Boundary, Core, and Scenarios to look for areas of proposal overlap and possible consolidation. On Friday, February 27, Science Group Summary presentations were held and a very preliminary run plan was presented. An updated preliminary run plan will be shared with the team later in March. The forum concluded with a Team Photo in the auditorium with a large fraction of the team able to participate. Forum presentations are downloadable from:

http://nstx.pppl.gov/DragNDrop/NSTX_Meetings/Research_Forum/FY2015/Presentations/
(J. Menard)

Jeff Wang (LANL) visited PPPL to participate in the NSTX Research Forum, and presented an informal seminar "Using LGI experiment to achieve better understanding of pedestal-edge coupling in NSTX-U". (R. Maingi, PPPL)

A contingent from DIII-D (Gustavo Canal, Josh King, Rob La Haye and Tom Osborne) visited PPPL to take part in the NSTX-U Research Forum. Rob La Haye gave a plenary talk on “Status and Plans for DIII-D and General Atomics Collaborative Research Grants in Support of NSTX-U”. (R. La Haye, GA)

Jean-Paul Allain (Professor of the University of Illinois at Urbana-Champaign) and his graduate student Felipe Bedoya visited PPPL to participate in the NSTX-U Research Forum. They also discussed the tasks remaining to install and commission the Materials Analysis and Particle Probe (MAPP) on NSTX-U with PPPL personnel. (R. Kaita, PPPL)

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

NSTX Upgrade activities continued with the final installations of TF bus in both umbrellas (see photo below). Hydrostatic testing of installed cooling water lines continues. NSTX-U Test Cell

scrubs marking the conclusion of construction activities and the start of operations prep are scheduled to start next week.

The Digital Coil Protection System (DCPS) and the Power Supply Real Time Control (PSRTC) are complete and supporting Field Coil Power Conversion (FCPC) System dummy load testing. Permanent installation of the expansion chassis to incorporate the redundant DCPS into the control system is in progress, and the pre-operational testing of the redundant DCPS via the auto-tester has started.

Preparations for plasma operations in the NSTX-U configuration also continued with dummy load testing of the FCPC power supplies utilizing PSRTC, DCPS, and the new rectifier firing generators. Individual TF branch and some parallel TF branch testing was completed, and systems are now ready to provide the combined 80KA TF Coil current required for the NSTX-U CD-4 plasma. Systems have now been configured for dummy load testing of the bi-directional OH system rectifiers. Also, field installation of gas delivery system piping, and re-commissioning of gas controls continued. Welding of the coaxial lines for the deuterated trimethylboron (dTMB) system in the test cell is in progress. Modifications to the test cell Emergency Stop circuits will be completed by early next week. Fiberoptic connections from the test cell to the FCPC Junction Area for the new plasma current (I_p) calculator are in progress, and preparations are underway to test the I_p calculator via the injection of test signals. Multipulse Thompson Scattering (MPTS) diagnostic Laser calibrations are scheduled to be performed on March 5th.

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