NSTX-U Weekly Report (April 10, 2015)

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

A successful Conceptual Design Review (CDR) was held for Peter Rindt (Technical University of Eindhoven) for a NSTX-U Liquid Lithium Tile Prototype. The conceptual design is for a pre-filled, liquid lithium tile suitable for use in a high-heat flux area such as the divertor. The design identifies several critical areas for prototype testing such as liquid wetting behavior under realistic heat loads and vacuum conditions. Several innovative manufacturing methods were examined in collaboration with outside vendors such as the use of wire EDM for the fabrication of a monolithic macrobrush concept as well as the testing of a novel method for the production of variable-porosity metal-salt spray coatings. Numerous aspects of the work have informed design and analysis of the current NSTX-U High-Z Divertor Upgrade 1 project. The 6 month project was conducted under the direction of PPPL advisors M. Jaworski and R. Kaita collaborating with N. Lopes-Cardozo of TU/Eindhoven. The CDR was chaired by L. Dudek. (M. Jaworski, PPPL)

A new postdoctoral researcher from Lawrence Livermore National Laboratory Dr Olivier Izacard has arrived on assignment to PPPL. Dr. Izacard will be working on multi-fluid and Monte-Carlo modeling of edge transport and plasma-surface interactions in NSTX-U in support of the planned snowflake, cusp-like, radiative divertor and lithium experiments. (V. Soukhanovskii, LLNL)

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

NSTX Upgrade activities are drawing to a close with final scrubs of machine areas in preparation for the vessel bake and subsequent coil power testing.

The Digital Coil Protection System (DCPS) and the Power Supply Real Time Controls (PSRTC) are complete and ready to support Coil System Power Testing and subsequent plasma operations. All of the high-speed FPDP links for the Plasma Control System (PCS) have been functionally tested.

Preparations for plasma operations in the NSTX-U configuration also continued. After the completion of the dummy load testing of all of the power supplies required for CD-4 plasma operation, coil system polarity checks were completed, the test cell hardwired interlock system was restored/tested, and flex bus connections were made from the Power Cable Termination Structure to the machine coils. A bake of the vacuum vessel center stack will be performed over the weekend, and coil system power testing will begin this week. A liquid helium cool-down of the NB#2 cryo-panels has been completed, and low Voltage conditioning of the NB#2 ion sources has started.

The NSTX-U Test Cell will be in restricted access during1st 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.