NSTX-U Weekly Report (September 22, 2017)

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

Recovery

In the Coil Winding Facility, all components of the VPI test mold are ready. Vacuum leak checking and installations of manifolds are underway in preparation for the test VPI. Bus work and supports for inner PF Coil power testing have been set up on the Field Coil Power Conversion (FCPC) Test Stand and are ready for engineering review. A Final Design Review of the FCPC Test Stand pump cart modifications was successfully held this week.

All equipment and hardware has been located for the horizontal positioning of the NSTX-U center stack. This repositioning is required to replace the center column cooling tubes, and will accommodate plasma facing component work. Metrology of the centerstack case inboard diverter continues.

The removal of the CHI gas injector has been completed, and the installation of the MSE-LIF gas injection system continues.

The neutral beam group successfully completed test runs of the Helium Refrigerator compressor water system this week.

Research

Members of the NSTX-U research team attended the 19th International Spherical Torus Workshop (ISTW-2017) at Seoul National University, Seoul, Korea, 19-22 September 2017. "Overview of NSTX Upgrade Initial Results and Modelling Highlights" was presented by J. Menard (PPPL). Oral presentations were "Facility and Diagnostic Commissioning for Initial Operation of the NSTX-U Facility" by M. Ono (PPPL), "NSTX-U Plasma Commissioning and Scenario Development" by D. Mueller (PPPL), "Non-axisymmetry at the center of NSTX – Lessons to optimize 3D tokamaks" by J.K. Park (PPPL), "Numerical simulations of stabilization of Global Alfven Eigenmodes (GAEs) in NSTX-U" by E. Belova (PPPL), Next-Step Low-Aspect-Ratio Tokamaks Using High-Temperature Superconductors and Liquid Metal Plasma Facing Components" by J. Menard, "Gyrokinetic heat-flux footprint in NSTX and NSTX-U plasmas" by S. Ku (PPPL), "Requirements, Designs and Plans for NSTX-U High Heat Flux Plasma Facing Components" by M. L. Reinke (ORNL), "The effects of the HHFW wave-field on the evolution of fast ion / beam ion populations in NSTX plasma" by N. Bertelli (PPPL), "NSTX Vertical Displacement Event 3D nonlinear modelling with M3D-C1" by D. Pfefferlé (PPPL), "Progress toward LTX-β" by R. Majeski (PPPL) "Transient CHI Research on STs" remotely presented by R. Raman (University of Washington), and "Validating gyrokinetic predictions using NSTX-U plasmas" by W. Guttenfelder (PPPL). In addition, six NSTX/NSTX-U related posters were presented. The workshop was well attended with approximately 66 registered participants from 8 countries including China, Japan, Korea, Italy, the United Kingdom, Russia, and the United States. Presentations included 13 overview orals, 21 contributed orals, and 24 posters. J. Menard chaired and M. Ono served on the ISTW program committee. The program also included a guided tour of Seoul National University experimental facilities including visits to the VEST spherical tokamak.

Several NSTX-U researchers and collaborators also attended the 1st Asia-Pacific Conference on Plasma Physics held Sept. 18-23 in Chengdu, China. Researchers presented the following invited talks: “Validating gyrokinetic simulations using NSTX and NSTX-U plasmas” by Walter Guttenfelder, “Optimization of Resonant and Non-resonant Magnetic Perturbations in KSTAR” by Jong-Kyu Park, “Power management in ITER for NTM control, the path from the commissioning phase to the demonstration baseline” by Francesca Poli, “Exploring the Regime of Validity of Global Gyrokinetic Simulation with Spherical Tokamak Plasmas” by Yang Ren, “Investigation of the Generalized Neoclassical Toroidal Viscosity Offset Rotation Profile in KSTAR” by Steve Sabbagh, and “Full toroidal computation of resistive MHD instabilities based on asymptotic matching approach” by Zhirui Wang.