

NSTX-U Weekly Report (August 25, 2017)

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

NSTX-U RECOVERY AND RESEARCH (J. MENARD)

Recovery

Additional metrology of the NSTX-U vacuum vessel and of the PF5/4/3 coil sets has been completed. These measurements are designed to improve the as-built coil models that are used to assess the error fields that they produce. For example, new measurements of the vertical positioning of the various PF coils facilitate the assessment of any tilting of the coils with respect to the machine axis. Additionally, measurements of the upper and lower nozzles of the outer vacuum vessel as well as the alignment of the machine axis with respect to gravity will be used to inform the machine reassembly process.

An oven run was completed in the Coil Winding Facility to cure the primer on test conductor bars, and co-wound taping of insulation is in progress. The PF inner coil test stand has been inspected and installed in the Field Coil Power Conversion Building.

All Voith Hydro work on MG#1 has been completed. Routine maintenance of MG#1 auxiliary systems (Switchgear, transformers, etc.) will be completed before MG#1 is restored to the GE specified program of periodic run-ups.

A successful Conceptual Design Review (CDR) for the FCPC Test Stand pump cart redesign was held on 8/19/17. A successful Final Design Review (FDR) for the Insulation Co-Winding & inspection station was held on 8/22/17.

A corrosion inspection was performed on the Ex-VVHS with negative results.

Research

Graduate student Hibiki Yamazaki from the University of Tokyo returned to Japan after a stay at PPPL. H. Yamazaki attended the one-week plasma courses with the SULI students and worked for six weeks with Luis F. Delgado-Aparicio (PPPL) on multi-energy SXR modeling for tokamak plasmas. A new computational tool was developed that can be used to calculate how many x-ray photons will impinge on the new multi-energy cameras to be installed in MST in Wisconsin, DIII-D in GA as well as NSTX-U. This capability will also be used for designing SXR systems for either small or large tokamaks in Japan. This work was sponsored by a partnership between Princeton and the University of Tokyo as well as Delgado-Aparicio's early career research award from DOE FES.

As part of collaboration with PPPL, MIT graduate student Juan Ruiz Ruiz has completed a verification of a new GYRO-based synthetic diagnostic for the NSTX / NSTX-U high-k scattering system used to measure high k turbulence. The verification exercise used cyclone base case the parameters to numerically verify analytic theory for the synthetic model, which will now be applied to electron-scale simulations of NSTX H-mode plasmas.