



The PPPL Highlights for the week ending April 7, 2018, are as follows:

NSTX-U RECOVERY AND RESEARCH (J. MENARD)

Recovery:

A successful preliminary design review (PDR) was held on April 3 for TF/OH bundle reliability. A successful PDR was held on April 5 for the bakeout DC connection.

On April 6, a mockup of the center stack assembly was lifted into the vacuum vessel to demonstrate the installation procedure with the new tighter clearances. The mockup fit successfully without any significant issues.

The PPPL winding shop has completed winding the conductor on the fourth and final layer of the PF1A prototype inner poloidal field coil.

Research:

E.-H. Kim was invited to give a seminar at Dartmouth College and the University of New Hampshire. She presented her recent research on wave modeling for tokamak and space plasmas. She also visited MIT for collaboration with other SciDAC team members.

A. Diallo participated in the meeting of the ITPA Pedestal and Edge Physics topical group in Stockholm, Sweden.

L. F. Delgado-Aparicio, K. Hill and B. Stratton have won a grant from the U.S. Department of Energy to develop novel X-ray diagnostics for profile measurements in tokamak plasmas, as well as install new equipment at the WEST tokamak at CEA, France located near the ITER site. The team will develop a Compact X-ray Imaging Crystal Spectrometer (cXICS) for impurity monitoring and to distinguish between the different charge states of an element (like tungsten). Additional soft and hard X-ray tomographic capabilities have also been proposed in conjunction with the cXICS.

U.S. ITER FABRICATION (H. NEILSON)

A subcontract deliverable for the low-field-side reflectometer (LFSR) project, "Stray Radiation Protection Design Report," was received from General Atomics of San Diego, CA. The report describes a protection system designed to make the diagnostic robust enough to withstand the ITER environment. The LFSR transceivers are sensitive to millimeter waves by design; therefore, the diagnostic is particularly vulnerable to incoming electromagnetic radiation generated both by the plasma and from external heating sources injected into the plasma. The report provides an overview of the hazards



to the LFSR and the system requirements for the protection system. The LFSR protection system is discussed in detail, covering the implementation of both passive and active components. The interface control system is also presented, with a summary of sensor inputs and outputs. The design details of individual protection components are provided, along with development plans for components that require further prototyping and testing.

ADVANCED PROJECTS (H. NEILSON)

Stellarators (D. Gates):

S. Lazerson made a presentation titled, “U.S. Research on International Stellarators,” to the National Academies Burning Plasma panel. The talk focused on the work being performed at Wendelstein 7-X by the team of U.S. researchers there. Lazerson was asked by the committee to help them better understand (1) the motivations and options for international stellarator research, (2) Lazerson’s experiences as a collaborator in the Wendelstein 7-X stellarator, (3) his views on how to enhance international stellarator research within the United States, and (4) strategic elements, based on the stellarator concept, that might broadly advance fusion research in the U.S. and promote leadership in the field. Topics presented included error fields, confirmation of optimization, divertor scenarios, and divertor physics. The talk was well received and highlighted the investment of the U.S. in the W7-X scientific program (trim coils, divertor scraper element, and multiple diagnostics).

ENVIRONMENT, SAFETY & HEALTH (J. LEVINE)

PPPL has been selected to receive a special DOE GreenBuy Program award for our consistent performance related to sustainable purchasing and DOE's target commodity categories. The award will be presented at the DOE Energy Exchange conference in August.

SITE PROTECTION (F. WHITE)

Members of the Site Protection Division participated in a DOE/NNSA conference call to discuss the upcoming 2018 DOE National Emergency Exercise. Engine 66 responded to a mutual aid assignment and Ambulance 166 responded to three mutual aid assignments in Plainsboro Township.



SCIENCE EDUCATION (A. ZWICKER)

On April 2, the Girl Scouts of Central and South New Jersey visited the Science Education Lab, where S. Greco conducted an electromagnet workshop, performed science demonstrations, and highlighted engineering and research career paths. They also went on a tour, led by A. Brereton and K. Lamb.

COMMUNICATIONS (L. BERNARD)

The Office of Communications posted one press release to the PPPL website. It focused on principal research physicist W. Tang, who recently won a highly competitive \$100,000 Global Impact Award from NVIDIA Corp., the leader producer of graphical processing units (GPUs) for carrying out artificial intelligence computing. The award was one of two presented at the NVIDIA national GPU technology conference held March 26-29 in San Jose, California. The story was also posted to the *EurekAlert!* and *Newswise* press release distribution services.

DIRECTOR'S OFFICE (R. HAWRYLUK)

From April 2-6, R. Hawryluk chaired a review meeting of the Helmholtz Association in Greifswald, Germany. He also participated remotely in the National Laboratory Director's Council meeting.

On April 4, Professor R. Socolow from Princeton University presented a colloquium entitled, "Paths to Low-Carbon Energy."

This report is also available on the following web site:
<http://www.pppl.gov/publication-type/weekly-highlights>