

**The PPPL Highlights for the week ending July 7, 2017 are as follows:**

**U.S. ITER FABRICATION (H. NEILSON):**

**Steady State Electrical Network (J. Dellas):**

Manufacture and testing of remaining equipment items is on track for completion in the current fiscal year. Assembly operations on the DC Distribution and the uninterruptible power supply (UPS) systems have recently been completed. Acceptance testing of the DC Distribution and 600 kVA UPS is complete, while factory acceptance testing for the 900 kVA UPS is scheduled for the first week of July at the supplier's facility in Switzerland.

**Diagnostics (R. Feder):**

Low Field Side Reflectometer (LFSR): The LFSR antenna components are housed in Equatorial Port 11 (EP11), a Russia domestic agency port plug. Engineering of ITER port plugs and the tenant diagnostic systems goes hand in hand. Performance requirements for the port plugs and diagnostics are interdependent and close collaboration is needed between the separate engineering teams. Typically the port plug integrated system is evaluated at a design review before the tenant systems. This is important so that global nuclear shielding and structural performance issues can be approved. The LFSR engineering team works closely with the RFDA EP11 engineering team to ensure a successful EP11 PDR in November 2018. This week the LFSR in-vacuum transmission line components were adjusted to improve EP11 nuclear shielding performance. The adjustment will require LFSR to use non-90 degree turning mirrors or mitre bends. This is not ideal for LFSR and will add some additional but manageable complications to the microwave signal collection and measurement. This is acceptable because if EP11 nuclear shielding performance is not approved then there will be no LFSR measurement at all. The adjustment also benefits the LFSR in-vacuum mirror cooling design by lowering nuclear heating.

Another important adjustment that has been made to the LFSR design in order to comply with port integration requirements is reducing the total number of channels from seven to six. A formal deviation request (DR) titled "Deviation Request for Adoption of 6-Antenna Configuration for the Low Field Side Reflectometry" has been submitted to ITER for approval. Deviation Requests are needed when an adjustment is made to a baseline, configuration controlled design. PPPL has worked closely with the General Atomics-based LFSR physics team to ensure that LFSR system performance meets all requirements. At the LFSR Conceptual Design Review (CDR) there were eleven microwave channels but this concept was somewhat

unconstrained by port integration. With the approval of the 6-channel LFSR DR engineering of the LFSR system and EP11 can both proceed through the PDRs to final design.

## **ADVANCED PROJECTS (H. NEILSON):**

### **Stellarators (D. Gates):**

S. Lazerson presented the OP1.2a Experimental Programme to W7-X International Programme Committee as part of his role as the Scenario and Integration Task Force leader for the next experimental campaign. The presentation outlined the thematic milestones of the experiment and experimental goals for the next experimental campaign on W7-X. This campaign will include the first operation of the island divertor, 8 MW ECRH heating system, and pellet injection system. Lazerson is on a two-year assignment in Greifswald to participate in the OP1.2 experimental campaigns.

D. Gates participated in the final regular program committee meeting for the upcoming International Stellarator/Heliotron workshop to be held the week of October 2 in Kyoto, Japan, hosted by Kyoto University. The ISHW is a biannual meeting covering the world stellarator program. There will be one more special meeting of the program committee to pick two post-deadline oral presentations.

## **THEORY (A. BHATTACHARJEE):**

### **Computational Plasma Physics Group (S. Jardin):**

Stephane Ethier gave an invited talk at the PASC17 Conference in Lugano, Switzerland, as part of the mini-symposium, "Kinetic Simulations on HPC Platforms for Plasma Physics Applications: Physics Production Codes." Ethier's presentation was entitled, "Status of the Exascale Computing Project on High-Fidelity Whole Device Modeling of Magnetically Confined Fusion Plasma."

## **ENGINEERING (V. RICCARDO):**

**Fabrication:** The Advisory Committee for Construction Safety and Health (ACCSH) met June 20 and voted unanimously to extend the deadline for crane operator certification in accordance with 29 CFR 1926 Subpart CC one year from November 2017 to November 10, 2018. PPPL has adjusted its mobile crane-training schedule to meet the new date.

**Power Systems:** The S1/S2 15kV cable replacement project was completed one week ahead of schedule and under budget. The project returned all the Contingency [\$155,400], \$44,039 of construction cost and recycled 146,000 pounds of cable that equates to \$120,148 of funds back to the lab. In total, the project is returning \$319,588 to the GPP project pool.

**DIRECTOR'S OFFICE (S. ZELICK):**

**Site Protection (F. White):**

Emergency Services Unit (ESU) responded to a smoke odor at Princeton Plasma Physics Laboratory at C1.

Engine 66 responded to Princeton for one mutual aid assignment.

Engine 66 responded to Plainsboro for one mutual aid assignment.

Ambulance 66 responded to Plainsboro for one mutual aid assignment.

Ambulance 66 responded to Princeton for one mutual aid assignment.

**This report is also available on the following web site:**

**<http://www.pppl.gov/publication-type/weekly-highlights>**