The PPPL Highlights for the week ending January 25, 2013, are as follows:

U.S. ITER FABRICATION (D. JOHNSON):

C. Neumeyer presented a status report on Steady State Electric Network procurements to US ITER Project Office and DOE.

Revised ITER Diagnostics and Steady State Electric Network Project Plans were submitted as part of Project Change Requests to the US ITER Project Office.

Several documents (Quality Plans, Document Deliverable Checklists, etc.) related to Procurement Arrangements 5.5.P3.US.01 (Upper ports 11, 14, upper cameras) and 5.5.P4.US.01 (Equatorial port 9, ECE and TIP diagnostics) were approved at PPPL and submitted to the US ITER Project Office for approval prior to upload to the ITER Document Management System.

A draft Risk Plan for Upper Cameras was sent to the ITER Organization Responsible Officer for review prior to formal sign-off.

A RGA Risk Plan was submitted to the US ITER Project Office for approval.

A Monthly Progress Meeting on the RGA system featured discussions of ongoing preparations for the Preliminary Design Review scheduled for April 9-10.

Nova Photonics presented a revised optical design for the MSE diagnostic in a meeting with IO experts. This revision shows promise to improve the shielding efficiency of the viewing labyrinth, although detailed neutronics analysis will be needed to confirm and quantify this improvement.

NSTX (M. ONO):

During the week of January 21, Roger Raman (University of Washington) visited the Quest ST at Kyushu University to work on the final design of a CHI system for QUEST. Good progress was made in arriving at a viable CHI configuration for QUEST. Productive discussions were also held with a technical representative from an engineering company. He also participated in CT fueling experiments on Quest, which is led by the University of Hyogo group. In preparation for a long-term CT Fueling campaign on Quest, these initial experiments exercised the CT hardware to test its capability and compatibility with inductively generated plasmas on Quest. A fast framing camera was used to view the CT injection port, which showed the ejection of a CT

plasmoid from the CT port, which was then seen to disperse toroidally. Bright toroidal filaments were seen in the camera images following CT injection.

M. Ono (PPPL) visited the QUEST facility, Kyushu University, Japan during the week of January 21. He has participated in the long-pulse non-inductive plasma experiment. The QUEST plasma is solely driven by the 8.2 GHz, ~ 100 kW steady-state ECH source, and the plasma was sustained for up to 3 minutes in the experiment. He also discussed the CHI experiment on QUEST in collaboration with Roger Raman of University of Washington and Professor Hanada.

NSTX Upgrade construction activities continued this week and are highlighted in the Engineering section below.

Preparations for plasma operations in the NSTX-U configuration also continued with the ongoing fabrication of the new field coil power conversion (FCPC) system firing generators. A review of the new FCPC fault detector design was held this week, and included test data from the recent power testing using the prototype. The neutral beam group has begun the engineering of control and hardware upgrades to the Sulfur Hexafluoride (SF6) skid intended to streamline operations and reduce SF6 losses.

ADVANCED PROJECTS (H. NEILSON):

The Wendelstein 7-X (W7-X) trim coil supplier, Everson Tesla, Inc., has completed winding and testing of the fifth and last coil, and is preparing to perform the resin impregnation of the coil. Afterwards the coil services will be installed and final testing will be completed. The coil is currently scheduled to ship on February 6, which would mark the end of a year and a half fabrication process.

The fabrication of the instrumentation interface modules for the W7-X trim coils has begun at PPPL. The remaining parts needed for the fabrication arrived at the lab this week. PPPL electrical engineer X. Zhao is overseeing the fabrication of the modules, which will transfer temperature, voltage, and coolant flow signals from the trim Coils to the W7X central control system.

A paper documenting work in collaboration with the Large Helical Device (LHD) program, "A Magnetic Diagnostic Code for 3D Fusion Equilibria," by S. Lazerson, S Sakakibara (NIFS), and Y Suzuki (NIFS) was published: Plasma Phys. Control. Fusion 55 (2013) 025014.

THEORY (A. BHATTACHARJEE):

A paper co-authored by A. Hakim on non-linear simulations of RF propagation has appeared in Physics of Plasmas. In this, both PIC and non-neutral, multi-fluid models are used to study nonlinear wave coupling of IBWs in the edge of a tokamak plasma, leading to a characterization of parametric decay instabilities, a serious parasitic loss mechanism in RF heating systems. The paper is now online at :
http://pop.aip.org/resource/1/phpaen/v20/i1/p012116_s1

Seminar highlight: On January 24, S. Klasky gave a theory seminar entitled "Accelerating Scientific Knowledge Discovery in DOE science." The presentation focused on the effect of data I/O management on code performance and scalability. Efforts in the development of ADIOS, the open source data management framework whose purpose is to increase I/O efficiency of massively parallel codes, while being easy to implement, were also discussed.

ENGINEERING AND INFRASTRUCTURE (M. WILLIAMS):

NSTX Upgrade (R. Strykowsky, E. Perry, L. Dudek, T. Stevenson):

Construction: The cutting of the vacuum vessel for the new bay L nozzle (for MPTS) has been completed. The drilling of counterbores in the outer TF aluminum castings has been completed. Modifications to the NE vessel leg have been completed. Cable trays are being installed in the test cell in preparation for the re-installation of cabling. Preparations are underway for the machining repairs to two outer TF coils.

Center Stack Upgrade: TF Conductors - five (5) TF conductors were primed January 25 and fabrication of new cover for quadrant mold continues by the Tech shop. The first half of the cover has been completed and the second half is expected to be completed by January 28. Major Tool has resumed fabrication of the Quadrant 5 conductors with delivery scheduled for February. Sandblasting and insulating of TF conductors continue in the winding area.

OH preparations: The OH winding tension station is being fabricated by Tech Shop. The OH Mold is ready for submittal to procurement. Everson Tesla has begun sandblasting and priming of the OH copper conductors.

Centerstack Casing: The initial in house measurements of the delivered Inconel casing have been successfully completed. The stand for mounting the CS casing vertical is being fabricated by Carolina Fabricators. The requisition for the ceramic breaks are out for bid.

Inner PF Coils: A bidders conference for Inner PF coils was held with Bids due back at PPPL by early February.

Outer TF Coil: Everson Tesla is proceeding with contract to build (2) OTF coils.

Coil Support Structures: The outer TF weldments have all been received and accepted for installation. A price quotation was received for the CS lower pedestal. Modifications were made to the finger supports on the outer TF lead extensions to improve the design. The analysis indicates an improvement in the stresses and the design is being detailed for release.

PFCs: The grafoil gaskets were cut at Carolina Fabricators. One set had a NCR written against it and is being remade. The complete order is expected to ship next week.

NBI Upgrade: The Bay JK external welding to the VV has been completed. Preparations for leakchecking these welds are ready but have been put on hold pending Bay L installation due to the temporary VV supports. Bay JK VV corner reinforcements are in progress. The BL2 dewar and valve box were installed. This key relocation allows other activities to proceed for cryo lines

and platforms. The BL upper tier source platform relocation has started. BL refurbishment continues. Lifting fixtures for HVEs are in progress. Procurement packages for cable and tray and for water piping are in development. Water system drawings are in progress. A WCC package for installation of NTC platform 109 and 119 bridges is in progress. LHe cryogenics line installation on the TFTR Test Cell South wall continues. Fabrication in the Tech Shop continues on the central spool section for the NBI duct. Planning for fabrication and installation of the Bay JK RLM coil continues and conductor material has been acquired. Some additional TVPS vacuum equipment has been delivered.

Office of Project Management:

The Work Planning online system was updated to version 6.0 with new features, functions, and fixes. The EVMS self assessment report has been completed and is in approvals. System Engineer training with the online package is in progress. Development of the COG/RLM online supplemental training package has started. A work planning process review of the work associated with the Lithium dropper exothermic reaction last August has started. The Project Management System Description link was restored on the Project Management web page.

Facilities and Site Services Division (M. Viola)

Energy Management: We received a Natural Gas curtailment on January 23, which required us to switch the boilers over to oil due to a higher price for natural gas per decatherm than oil. We switched from oil back to natural gas on January 26 since the price of natural gas per decatherm has come back down below the price for oil. Extremely cold weather has caused some comfort concerns and the HVAC settings were adjusted to address them.

Engineering Services: The estimate for the GPP Project “ESU Waterproofing” was forwarded for review. Insulation work is being completed in the C-Site MG Area this week.

Telecommunications: The Telecommunications Office and Altura installed the newest Avaya phone system software revision on the remainder of the Lab’s phone system Gateways (2-6); the new software has been performing successfully.

Fire Protection: A draft response was prepared for the Fire Protection System Review that occurred last week. .R. Jeanes participated in Lithium Safety Committee meeting to hear a proposal on a new lithium experiment called "Stationary Flowing Liquid Lithium System.

BUSINESS OPERATIONS (E. WINKLER):

Representatives of Procurement, Quality Assurance and ESH&S met to finalize plans for the onsite service subcontractor assessment pilot program. The program documentation and reporting procedures are being revised as a result of this discussion. The next step will be to convene a stakeholder meeting to explain the pilot program and its objectives. This meeting will be scheduled in the next 2-3 weeks.

The Procurement Division conducted its annual ethics briefing. Kevin J. Licciardi of the University Office of General Counsel also participated, together with E. Winkler.

The Procurement Division reported the Laboratory's first quarter procurement cost savings results to the DOE Office of Management via the Brookhaven National Laboratory Contracting Officer, and to the Office of Science via the Argonne National Laboratory Procurement Manager. Using the DOE-defined categories, PPPL reported total cost savings of $483,129.36. Cost savings derived from Procurement operations is one of the metrics included in PPPL's FY 2013 procurement balanced scorecard (BSC) plan. This year's BSC target is to achieve cost savings equal to 3.25% of PPPL's total procurement award dollars.

S. Drapkin from the PPPL Accounting Division participated in a conference call conducted by the DOE. The purpose of the call was to inform contractors that the Supplementary Compensation data will now be reported to the DOE Office of the CFO using the iBenefits system. This information was previously reported to the Office of Legacy Management for their annual report required by Congress through the Workforce Information System (WFIS).

T. Gillars attended an introductory training session, hosted by the Princeton University Office of Finance and Treasury, which provided an overview of the University's new chart of accounts structure and fields.

PPPL responded to a Government Accountability Office (GAO) data request in connection with a GAO review of Work for Others (WFO) programs at DOE national laboratories. The key objectives of the review are to understand: (1) the work being done under DOEs WFO program; (2) the goals of the WFO program and how DOE measures performance against those goals and (3) DOE efforts to ensure that WFO projects meet cost recovery requirements.

A work for others agreement with Princeton University was executed. PPPL will support the University on a grant received from the Department of State. The PPPL Principal Investigator for this effort is R. Goldston; the funding to be provided by Princeton University is $70,000 for the one-year period of performance.

ENVIRONMENT, SAFETY, HEALTH & SECURITY (J. LEVINE):

Emergency Services Engine 66 responded to one mutual aid assignment in Princeton, two mutual aid assignments in Plainsboro, and one assignment to PPPL C-Site (overactive cigarette receptacle). Ambulance A166 responded to three mutual aid assignments in Plainsboro.

DOE/PSO approved the PPPL Continuity of Operations (COOP) Implementation Plan, Rev. 4.

The PPPL Department Call Trees were updated for FY 2013 and provided to the Emergency Services Communication Center (ESCC). The Department Call Trees will be used only in the event of a PTENS failure (Princeton Telephone and E-Mail Notification System).

The Environmental Services Division (ESD) shipped 58 Kg of PCB ballasts and 360 Kg of non-PCB ballasts for recycling. On January 24th PPPL's environmental services contractor removed 280 gallons of oil from the D-Site generator for off-site recycling.

A management safety walkthrough of the CS, COB and Shop Buildings 1st Floor and CS Building Basement was held on January 23. ES&H conditions in these areas ranged from fair to very good.

OFFICE OF COMMUNICATIONS: (K. MACPHERSON):

C. Cane gave Drupal training to Lab members from Tech Transfer, HR, and Theory and worked on associated documentation. He also trained the Communications group on the broadened use of Google docs for team projects and communications.

J. J. DeVoe and G. Czechowicz edited, designed and produced the PPPL Weekly, including stories on PPPL scientists winning time on the world's fastest supercomputers and a profile on postdoctoral fellow Arturo Dominguez, the newest member of the Science Ed team.
DeVoe also edited the ESH&S quarterly newsletter.

J. Greenwald worked to select a source for the layout and design of the PPPL Quest magazine that is to be inserted into the Princeton Alumni Weekly this summer. He also completed a draft news release about the licensing of the technology for a fusion-powered rocket engine to a New Jersey company.

K. MacPherson hosted a teleconference on January 24, of the Magnetic Fusion Communications Working Group, also attended by J. Greenwald who wrote a summary of the proceeding. This was subsequently distributed to all members. She also submitted the PPPL proposal, as well as all National Lab proposals, to Disney for potential exhibits at an upcoming exhibition known as Future Fest.

E. Starkman shot photos of visitors from the NYC Mayor's Office for a meeting on the Cool Roof project, and created a photo gallery for them. She took photos of visitors to Science on Saturday, as well as of a speaker, Joshua Goldston Peek, a Hubble Fellow. She provided photos from the archives for several Communications projects.

BEST PRACTICES & EXTERNAL AFFAIRS (J. DELOOPER):

The following PPPL Reports were posted to the web:

Observation of EHO in NSTX and Theoretical Study of its Active Control Using HHFW Antenna PPPL-4843
Authors: J.-K. Park, et. al.
Submitted to: Nuclear Fusion (January 2013)

Representation of Ideal Magnetohydrodynamic Modes PPPL-4844
Authors: Roscoe B. White
Submitted to: Physics of Plasmas (December 20112)

Detection of Disruptions in the High-β Spherical Torus NSTX PPPL-4845

Authors: S.P. Gerhardt, D.S. Darrow, R.E. Bell, B.P. LeBlanc, J.E. Menard, D. Mueller, A.L. Roquemore, S.A. Sabbagh, H. Yuh
Submitted to: Nuclear Fusion, (January 2013)

Traverse Focusing of Intense Charged Particle Beams with Chromatic Effects for Heavy Ion Fusion PPPL-4846
Authors: James M. Mitrani, Igor D. Kaganovich, Ronald C. Davidson
Presented at: 54th APS Division of Plasma Physics Conference, Providence, RI (October 2012)

DIRECTOR'S OFFICE (B. SOBEL):

On January 15, the first PPPL Research Meeting was held. The purpose of the meetings is to communicate across the Departments and Projects about significant results and developments. This meeting will be held approximately monthly, and is coordinated by the Research Meeting Committee - initially E. Fredrickson, S. Kaye, P. Porazik, and R. Wilson. They can be contacted at ResearchMeeting@pppl.gov . The agenda for the January 15 meeting was: Current events (FESAC, budget- M. Zarnstorff), Update from ITPA Planning Meeting (S.Kaye and J.R.Wilson), and RMP Induced ELM Suppression in the DIII-D Tokamak (R.Nazikian).

On January 22, S. Prager gave a 30 minute presentation to Third Way, which is a Washington, D.C.-based centrist public policy think tank.

Prager also met with congressional staffers while in DC.

On January 23, Dr. John P. Krasting, Geophysical Fluid Dynamics Laboratory presented a colloquium entitled "Ensemble Modeling of Climate-Carbon Cycle Interactions".

This report is also available on the following web site:
http://www.pppl.gov/polWeeklyHightsExternal.cfm