

THIS WEEK

WEDNESDAY, FEB. 15

Laboratory Management Review
8 a.m.-12:10 p.m.
[Live stream link – to view only](#)

OMO Blood Pressure Screening
11 a.m.-1 p.m. ♦ LSB Lobby

SATURDAY, FEB. 18

Science on Saturday
9:30 a.m. ♦ MBG Auditorium
[Cities in the 21st century:
the nexus of the climate,
water, and energy challenges](#)
Elie Bou-Zeid, Princeton University

UPCOMING

MONDAY, FEB. 20

**Final day to apply to present
at Princeton Research Day**
[See page 6 for more information.](#)

FEB. 24-25

**New Jersey Regional Middle
and High School Science Bowls**
[See page 6 for information
on how to volunteer](#)

WEDNESDAY, MAR 1

PPPL Colloquium
4:15 p.m. ♦ MBG Auditorium
[Future Electrical Energy Supply
Metrics Including Dynamic Energy
Return on Investment \(EROI\)](#)
Charles Neumeyer, PPPL

SATURDAY, MAR. 11

Princeton Research Day

MAR. 12-15

**Mercer Science and
Engineering Fair**
[See page 6 for information on how
to volunteer.](#)

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Fourth DVVR focuses on magnets

By Jeanne Jackson DeVoe

Engineers are trying to determine how best to replace the PF1A-U, a failed magnet that was nestled in the center stack of the National Spherical Torus Experiment-Upgrade (NSTX-U) that is one of six similar magnets.

New designs for the Poloidal Field coil 1A upper (PF1A-U) coil were discussed at a Design, Verification and Validation Review (DVVR) review for magnets last week. The DVVRs are intended to identify any gaps in NSTX-U systems as part of an overall extent of condition review of the machine. Gaps that could affect PPPL's research mission will be included in a corrective action plan to be submitted to the U.S. Department of Energy (DOE).



Members of the review committee examine the center stack on a tour. From left: Stefan Gerhardt, deputy engineering head for the NSTX-U Recovery Project; Josh King, program manager for Spherical Tokamak at the U.S. Department of Energy's Fusion Energy Sciences (FES) program; and PPPL engineers Steve Raftopoulos and Danny Cai. (Photo by Elle Starkman)

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2016 Safety Survey indicates staff perceives strong safety culture at PPPL

By Jeanne Jackson DeVoe

The 2016 PPPL safety survey of all staff indicated PPPL'ers believe the Laboratory has a strong safety culture in which more than 90 percent of employees take ownership for safety at PPPL.

Some 99 percent of employees said they would stop work if they saw anything taking place that would endanger people, property or the environment. Another 95 percent said they and their work groups consider the safety consequences of their actions.

The survey, which is sent out annually through four quarterly surveys, had a participation rate of 57 percent, down slightly from 61 percent in 2015. It has been sent to staff since 2013.

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Open floor plan for LSB Annex offices as IOI work continues

By Jeanne Jackson DeVoe

New office space in the Lyman Spitzer Building annex will be modern, attractive and full of light, said Les Hill, head of the Infrastructure Operational Improvements (IOI) project.

“It’s going to be a nice open floor plan with a lot of light coming in,” Hill said.

There will be offices along the front and back of the building and in the center of the building but no offices along windows on the wall facing the D Site parking lot, allowing light to come in from the windows there. Offices along the walls will have glass panels at their front to let light into the central cubicles, Hill said.



Cement footers in the basement of the C Site-MG Building. (Photo by Elle Starkman)

Contractors are framing out offices and cubicles in the building. Both will be fitted with modern, attractive furniture, Hill said. Plans call for a small meeting space on the second floor and a larger one on the first floor, Hill said. Workers have also prepared plans for new ductwork and piping for new HVAC systems that will be installed in the building, he said.

At the C-Site Motor Generator building, the other major part of the project, workers have poured concrete for dozens of footers in the basement of the building. These will hold large pillars supporting a new concrete slab floor. It will cover huge holes that once housed motor generators for previous experiments at PPPL and will reinforce the existing floor.

The concrete slab floor must be strong enough to hold heavy machinery for new machine shops that will be relocated to the MG building from the Research Storage and Assembly (RESA) building. The RESA building will then be converted into a modern storage warehouse.



Metal frames of offices on the third floor of the Lyman Spitzer Building Annex. (Photo by Elle Starkman)



Les Hill, head of the IOI project, on the third floor of the Lyman Spitzer Building Annex. (Photo by Elle Starkman)

Workers have completed demolition of an enclosure at the MG building that once housed electrical equipment and took up a large part of the corner of the building. All that is left is cable trays containing about 50 circuits that are either in use or support other electrical loads. Those trays will be kept on site and protected, Hill said.

Hill said he is feeling positive about progress on the project. “So far we continue to be pleased with what we’re seeing,” Hill said. “Am I happy? Yes. But I’m not delusional. This job doesn’t go on automatic pilot. The only way you can keep this job on track is constant TLC. There’s no easy way to get that done.” 🙌

The OMO will be conducting a blood pressure screening

Wednesday, Feb. 15

11 a.m. to 1 p.m.

In the LSB Lobby



DVVR

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The magnet DVVR, the fourth of 12 such reviews, is essential, said Rich Hawryluk, the head of the NSTX-U Recovery Project. "This is undoubtedly the most important of the DVVRs," Hawryluk said at the beginning of the DVVR Committee presentations. He noted that the experiment was shut down last summer because of the failure of the PF1A-U, the upper poloidal field coil magnet. "Getting your input about the issues we have and the issues you see is really important to us," Hawryluk told the committee. "For this one, it's really important that we identify where we go from here."

The new design for the PF1A-U coil must address all component and system design requirements and identify residual risks. The new design may result in changes in the material and the configuration of the coil.



Engineer Neway Atnafu gives a presentation at the magnets DVVR. (Photo by Elle Starkman)

Six coils manufactured identically

The PF1A-U magnet and a twin magnet, the PF1A-L, along with two sets of smaller magnets, the PF1B and PF1C lowers and uppers, were all manufactured identically. Now the NSTX-U Recovery Team must determine whether all three upper/lower coil pairs (six coils in total) must be replaced and whether the coils should be built at PPPL, a commercial supplier, or at a national laboratory or some combination.

Neumeyer told reviewers that solving the problem of what to do about the Inner PF coils is essential. "The strategy for coil replacement will be a key driver of the overall outage schedule," he said. "We would like the committee to deliberate on this and give us their input."

The poloidal field coils shape the charged gas called plasma inside the vacuum vessel of the tokamak. The central magnet at the core of the NSTX-U and the poloidal and toroidal field coils on the outside of NSTX-U help contain the plasma. At the same time, an ohmic heating coil in the center stack injects a current into the plasma to help create a magnetic field and help heat the plasma to hot temperatures during experiments.

PF1A-U failure

The failure of the PF1-A coil resulted in an inoperable machine. This event, compounded by previous difficulties encountered since the start-up of NSTX-U, led to the directive from the U.S. Department of Energy, to conduct the extent of condition review.

An investigatory team that performed extensive tests on the failed coil has not found a definitive root cause yet but concluded that an electrical short between turns was the final event in the coil failure. It also found that the vacuum pressure impregnation (VPI) process was "very poor." The process involves wrapping copper conductors in Kapton tape and fiberglass and then injecting a liquid resin into the coil in a vacuum-sealed mold and baking it to create the magnet.



Engineer Peter Titus gives a talk at the magnets DVVR held last week from Feb. 7 to 10. (Photo by Elle Starkman)

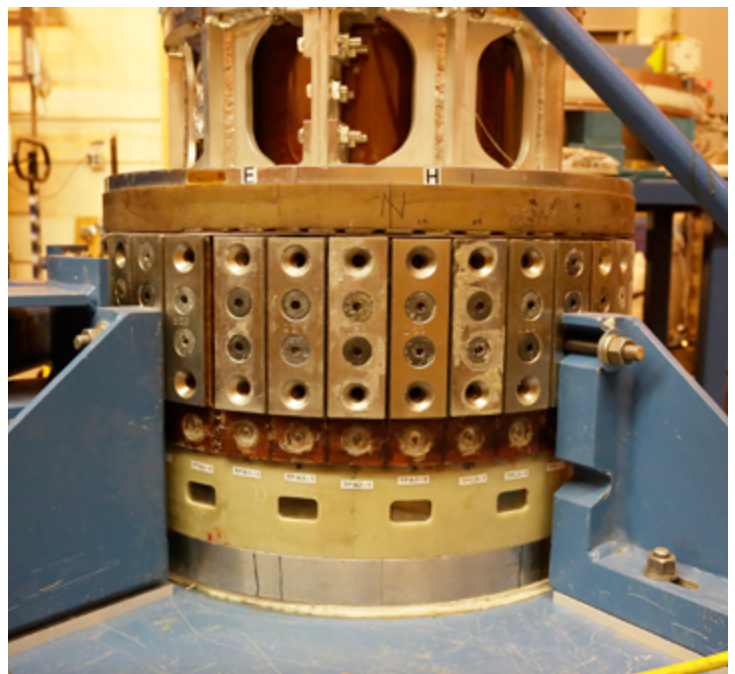
Engineers and technicians are now performing additional tests that include metallurgical tests to test the hardness of the copper used in the magnet. They have also sent out samples of the epoxy used in the VPI. On Friday, the committee discussion included a representative from the company that produces the resin used in the VPI.

New coil winding facility

Meanwhile, PPPL is preparing a coil winding facility at PPPL in the C-Site Building. The site was where the central TF and OH magnets for NSTX-U were wound and the coil-winding device is now being adapted to wind the smaller coils.

The external members of the review team included Bill Beck, of MIT's Plasma Science and Fusion Center, Nicolai Martovetsky, the U.S. ITER Magnet Systems R&D manager; John Smith, of US ITER at General Atomics National Laboratory consultant Dick Reed, Iain Dixon, of the National High Magnetic Field Laboratory; as well as Tom Todd, the chair of the External Condition Review Committee. Among those attending remotely were: Frank Casella, of US ITER, Martin Cox of the Culham Centre for Fusion Energy, James Irby, Brian LaBombard, and Rui Viera, of MIT's Plasma Science and Fusion Center; Michel Hugué, former head of ITER EDA site; and Rem Haage, former ITER Director General, all of whom attended via video conference, and numerous PPPL staff members. Also attending were Josh King, program manager for Spherical Tokamak at the U.S. Department of Energy's Fusion Energy Sciences (FES) program and Matthew Lanctot, program manager for Long-pulse Tokamak at the DOE's FES.

The next DVVR from Feb. 14 to 16 will focus on the vacuum vessel and internal hardware. This DVVR is also considered essential to the NSTX-U review. [📍](#)



The bottom of the center stack. (Photo by Elle Starkman)

2016 Safety Survey

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“The survey shows PPPLers have a generally positive outlook on PPPL’s safety culture,” said Jerry Levine, head of Environment, Safety and Health, “but there is always room for improvement.”

Levine said the ES&H Executive Board has asked the Laboratory’s Safety Review Committee and the Safety Champions Committee to review and respond to the report. Dorothy Strauss, ES&H program manager, presented the results to the ES&H executive board in late January. The results were released to all staff two weeks ago. [A full report is available here.](#)

PPPL staff members were generally either just as positive or more positive about safety than in last year’s survey and previous years.

For example, 91 percent of employees in 2016 said there are effective ways to communicate safety concerns at PPPL, compared to 86 percent in 2014, the first year the question was asked.

The report noted that the only question with a consistent decline from 2016 than in 2013 was whether the Laboratory learns from its mistakes with 76 percent agreeing in 2016 (the same percentage as in the previous year) compared to 87 percent in 2013.

PPPLers were very positive about their ability to communicate safety problems, with 91 percent saying there are effective ways to communicate safety issues and concerns and ideas to management and 94 percent saying that raising safety questions is encouraged.

There were also positive views of PPPL leadership’s commitment to safety with an average of over 87 percent saying that PPPL’s directors and managers demonstrate a commitment to safety through their words and actions.

A large majority of PPPLer’s said they have a positive view of the role of supervisors with 90 percent saying their supervisors ensure compliance with safety policies and procedures and 88 percent saying there is adequate interaction with their supervisors to make sure work is carried out safely.

One question in which responses were less positive was the question of whether staff members report ES&H concerns even when no harm is done with 40 percent saying they always do so and 38 percent saying they usually do with 21 percent say they “sometimes” or “never” report concerns.

PPPLers were also less positive about the reaction to safety problems at the Laboratory with 77 percent saying PPPL focuses more on learning from unfavorable situations than on assigning blame and 76 percent saying PPPL learns from its mistakes.


Supervisors were more positive than non-supervisors in several areas in the survey. For example, 96 percent of supervisors said they are comfortable questioning working practices and speaking up when they see people ignore safety regulations compared to 82 percent of non-supervisors. And while 96 percent of supervisors said their ES&H concerns are respected and addressed, only 86 percent of non-supervisors agreed.

The only area in which non-supervisors were significantly more positive was the STOP program itself. The STOP program is aimed at improving safety by reinforcing employees’ positive behaviors and correcting unsafe behaviors. Some 81 percent of non-supervisors stated that the STOP program reinforces safe behavior and corrects unsafe behavior compared to 67 percent of supervisors.

The survey found that office workers have a significantly more positive view of safety at the Laboratory than workers in the field. While 91 percent of office workers said management’s reaction after an accident is appropriate, for example, only 63 percent of field workers agreed. Some 86 percent of office workers said PPPL focuses more on learning from unfavorable situations than on assigning blame, compared to 64 percent of field workers. And 95 percent of office workers said there is good communication about safety from the top down, compared to 77 percent of field workers.

On the flip side, 75 percent of field workers said they receive comments from their supervisors on their safety behavior, compared to 50 percent of office workers. Office workers often point out in the survey that they believe they have many fewer safety issues in the office than do workers in the field. While 75 percent of field workers said PPPL’s safety culture is improving, only 53 percent of office workers agreed.

Research staff members were also generally more positive about safety than operations staff. Some 93 percent of research staff agreed that the Laboratory’s top leaders take action to demonstrate their commitment to safety, for example, compared to 77 percent of operations staff.

Levine and Strauss said they encourage staff members who received the safety surveys last week to take the time to fill them out. “We use the surveys to improve safety for the benefit of the Lab and everyone who works here,” Strauss said. “We’re trying to learn to do things better,” Levine added. 

Save the date: American Red Cross Blood Drive March 15

Mark your calendar!

American Red Cross Blood Drive at PPPL

Wednesday, March 15

More information will be sent out at a later date.

Ronald E. Hatcher

Science on Saturday LECTURE SERIES

Feb. 18

Cities in the 21st century: the nexus of the climate, water, and energy challenges

Elie Bou-Zeid, Princeton University

Feb. 25

NO SCIENCE ON SATURDAY LECTURE—Department of Energy's 2017 New Jersey Regional High School Science Bowl

Mar. 4

Eyes wide open and all hands on deck: Challenges and opportunities in responding to the risks of climate change

Elke Weber, Princeton University

Saturdays at 9:30 a.m., MBG Auditorium

Staff, Family & Friends Ski & Snowboard Trip

Join your co-workers, families and friends for a fun day of skiing and riding at Shawnee Mountain! Just a 90-minute drive from Princeton. Shawnee is a great place for novice skiers and riders, offering a "Best Value" package of lift ticket, equipment rental and lessons for only \$65.

NOTE: We need a minimum of 15 participants to get the discounted group rates shown below.

TRIP DETAILS - SATURDAY, MARCH 4, 2017

- Mountain is open from 8:00 am to 10:00 p.m.
- Lift Ticket: \$38.00/person
- Lunch Voucher: \$9.00/person (includes a choice of hot sandwich or salad, soft drink and French fries)
- Ski/Board Rental: \$25.00/person
- Helmet Rental: \$9.00/person
- "Best Value" Ski or Snowboard Package: \$65.00/person

(\$90 value: all-mountain lift ticket, rental & group lesson — lesson times throughout the day)

QUESTIONS:

Contact Rob Sheneman (x3392 or rsheneman@pppl.gov)

Two-step reservation process:

- 1. Complete the online reservation form using the link below:
<https://goo.gl/oNNnWY>
- 2. Make your payment in cash or check to Rob Sheneman by 4 p.m. March 1. (x3392, MOD VI, Room 111)

Information on carpooling and how to pick up your lift tickets and vouchers will be distributed by email after you make your reservation.

**Reservation deadline:
Wednesday, March 1 by 4 p.m.**

This event is not sponsored by PPPL nor financially supported by DOE contract funds.

Application opens for presenters at 2017 Princeton Research Day

Applications are being accepted through Feb. 20 for non-faculty researchers at Princeton University, such as undergraduates, graduate students and postdoctoral researchers, to present at the second annual 2017 Princeton Research Day on May 11.

The application is available at <https://researchday.princeton.edu>.

[The link to the Research Day website is available here.](#)

[The link to the application is available here.](#)

Science Bowl Volunteers Needed: Feb. 24 and 25

PPPL will host 48 teams of middle and high school students (about 250 students total) on Friday, Feb. 24 and Saturday, Feb. 25 for the New Jersey Regional Middle and High School Science Bowls.

We need your help! Please sign up to help out in technical (science judge, moderator) at goo.gl/forms/a5SoxOiJhufQgIm63 or in non-technical positions (score-keeper, registration, lunch, before/after prep) at goo.gl/forms/aF2PsP009W0EF1H63. Lunch will be provided for competition day volunteers.

Please contact Deedee Ortiz at dortiz@pppl.gov or ext. 2785 to sign up or for more information.

Volunteers wanted for Mercer Science and Engineering Fair

Organizers of the Mercer Science and Engineering Fair are looking for scientists and engineers to volunteer as judges of fourth to twelfth-grade science projects during the fair in March at Rider University.

Students from Mercer County schools show off their original science projects at the fair from March 12 to March 15. Judging takes place March 12 to 13. Additional information about the fair is available at <https://mercersec.org/about/msef>.

To volunteer, go to <http://mercersec.org/help/BecomeAJudge> or contact volunteers Kevin Lamb, klamb@pppl.gov or Hans Schneider, hschneid@pppl.gov.

The fastest eater wins



PPPLers chow down in a wing-eating contest in the cafeteria on Feb. 3 in honor of the Super Bowl. From left, clockwise: Chris Roames, Margaret Kevin-King, Denis St-Onge, Ryan Fregosi, Dave Hudak, and Dana Eckstein. St-Onge won the contest and received a backpack as a prize with Kevin-King coming in a close second. (Photo by Elle Starkman)

BRÖCK

NICK PETTI
Chef Manager



BREAKFAST 7 a.m. • 10 a.m.
CONTINENTAL BREAKFAST 10 a.m. • 11:30 a.m.
LUNCH 11:30 a.m. • 1:30 p.m.
SNACK SERVICE until 2:30 p.m.

	Monday February 13	Tuesday February 14	Wednesday February 15	Thursday February 16	Friday February 17
COMMAND PERFORMANCE Chef's Feature	Turkey Tetrazzini with Dinner roll	Fried Chicken with Mashed Potatoes and Fried Green Tomatoes	Pepper Steak with Rice	Guest Chef "Bobby Flay" Mesa Grill Cookbook recipes: Chicken & Mushroom Posole, Grilled Tuna with Red Tomatillo sauce over Black Rice with Chayote Succotash and Mesa Grill Blue & Yellow Corn Muffins	Pesto-Crusted Tilapia with Wild Rice
Early Riser	Potato Skins with Egg, Bacon & Swiss Cheese	Steak, Egg & Cheese Quesadilla	Corned Beef Hash with 2 Eggs	French Toast Sicks	2 Eggs, Choice of Breakfast Meat & Tater Tots
Country Kettle	Egg Drop	Turkey Noodle	Tuscan Bean	Split Pea	New England Clam Chowder
Deli Special	Jerk Chicken with Pepper Jack and Roasted Peppers on Brioche roll	Italian Chopped Antipasti Wrap	Shrimp Salad Wrap	Asparagus, Sundried Tomatoes, Roasted Peppers & Mozzarella Cheese Wrap	Chicken Parmesan Sub
Grill Special	Tater Tot Nachos	Hawaiian Teriyaki Burger	Falafel Pita	BBQ Chicken Grilled Cheese	Crab, Asparagus & Roasted Pepper Quesadilla
Panini	3 Cheese Panini with Cheddar, Swiss & Blue Cheese with Bacon & Tomatoes on Sourdough	Sausage Torpedo with Peppers & Onion	Teriyaki Chicken with Asian Slaw, & Swiss Cheese on a Kaiser Roll	Open-Faced BBQ Turkey Sandwich	Grilled Peanut Butter and Banana

MENU SUBJECT TO CHANGE WITHOUT NOTICE

HEART HEALTHY

VEGETARIAN OPTION

WEEKLY

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The PPPL WEEKLY is published by the [PPPL Office of Communications](#) on Mondays throughout most of the year and biweekly during the summer, except for holidays.

DEADLINE for calendar item submissions is noon on WEDNESDAY. Other stories should be submitted no later than noon on TUESDAY.

Comments: commteam@pppl.gov ♦ PPPL WEEKLY is archived on the web at: <http://w3.pppl.gov/communications/weekly/>.