PPPL PRINCETON PLASMA PHYSICS LABORATORY
A Collaborative National Center for Fusion & Plasma Research
U.S. DEPARTMENT OF ENERGY
WEEKLY
June 20, 2016

Calendar of Events

THIS WEEK

MONDAY, JUNE 20

Mandatory All-Hands Safety Meeting
1–2:30 p.m. ◆ MBG Auditorium
See page 6 for details.

WEDNESDAY, JUNE 22

PPPL Colloquium
4:15 p.m. ◆ MBG Auditorium
Liquid Metal Batteries for Large-scale Energy Storage
Professor Hojong Kim, Pennsylvania State University

UPCOMING

JUNE 28–30

US-PRC Magnetic Fusion Collaboration Workshop

WEDNESDAY, JUNE 29

PPPL Colloquium
4:15 p.m. ◆ MBG Auditorium
The Observation of Gravitational Waves from a Binary Black Hole Merger
Dr. Duncan Brown, Syracuse University

INSIDE

Work begins this fall on IOI phase of $130 million campus plan

By Jeanne Jackson DeVoe

PPPL will likely begin construction this fall on two major components of a project to modernize office space in the Lyman Spitzer Building (LSB) annex and create centrally located, up-to-date machine shops in the C-Site Motor Generator (MG) Building. The work is part of the Laboratory's $26 million facility renovation project, the Infrastructure and Operational Improvements (IOI) Project.

The C-Site MG Building is ready for construction after concrete was removed.

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Project manager brings depth of experience to overseeing IOI

By Jeanne Jackson DeVoe

When Les Hill took the job as project manager for the $26 million Infrastructure Operational Improvements (IOI) Project, he came at a time when the project was speeding ahead. There was no time for him to get acclimated. He simply had to jump in with both feet.

But Hill seems unflappable in the face of the requirements, deadlines, budgetary decisions, and reviews that are all part of his job in shepherding the IOI project. That's probably because he has shepherded much larger and more difficult efforts in previous jobs as a project manager.

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Repurposing something old to test something new

By John Greenwald

Can ancient magnets help develop a critical diagnostic for ITER, the huge tokamak under construction in France to demonstrate the feasibility of fusion power? Researchers at PPPL believe so. They are using coils from the Adiabatic Toroidal Compressor (ATC) experiment that operated at PPPL in the 1970s, and were later used to check power supplies for the Tokamak Fusion Test Reactor (TFTR), to test the ability of a spectrometer being built for ITER to survive high magnetic fields.

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IOI update

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The IOI is the second phase of an ambitious 10- to 15-year $130 million campus plan to bring PPPL's facilities into the 21st century by updating offices, meeting spaces, technical shops and laboratories, said John DeLooper, interim deputy director for operations. Many of the 32 buildings and laboratories on PPPL's 90-acre campus were built in the 1960s and 70s and even the newest building, the Lyman Spitzer Building, was constructed in 1980. "The campus plan will update the facility so we have modern research facilities and modern offices," DeLooper said. "Many of the buildings, especially on C-Site, have been deemed inadequate or substandard and we have a large list of maintenance activities that have been on the back burner and can be addressed by the campus plan projects."

Each piece of the campus plan will eventually fit together like pieces of an intricate puzzle that will not only improve office and laboratory space but will also add space within PPPL's existing footprint. The two main tasks of the IOI will begin at the same time as plans get underway to renovate the first floor of the Engineering wing and renovate the C-Site MG Building.

The start of construction on the annex will mean some 70 employees who work in the LSB annex will move to temporary offices as early as July. PPPL plans to rent up to 16 trailers to create two large office complexes that will be located outside the Theory wing next to the lower parking lot.

A potential proving ground

DeLooper said the IOI, which is funded by the Office of Safety, Security and Infrastructure in the Department of Energy's Office of Science, could be a potential proving ground for PPPL to show the DOE it can manage large building construction projects. "This is part of confidence building," he said. "We've proven we can build machines, now we've got to show that we're going to do these types of construction projects for the campus plan. It's the only way we can convince the DOE to provide additional funding for the campus plan work."

Leading the effort to ensure the IOI succeeds is Les Hill, the new IOI project manager, who filled the position vacated by Ron Strykowsky, who retired last February. "Executing this project smartly and delivering for DOE is important," he said. "They're going to send the money to the projects where they can get the biggest bang for the buck."

The milestone for completing the IOI project is October of 2019, but it could be completed sooner, DeLooper said. PPPL must get DOE approval for each stage of the project from Critical Decision 0 (CD-0), which describes how the project fits the mission of the Laboratory, to Critical Decision 4 (CD-4), when the project is certified as completed. PPPL has successfully completed CD-0, 1 and 2 and is now working to get CD-3, the construction phase, approved.

The IOI team is currently revising certain elements of the plan after bids came in too high. An independent peer review team will review the plans in August. Assuming DOE approves construction in September, work could begin in October on both the annex and the C-Site MG Building.

DeLooper said the IOI team reviewed various options to temporarily house employees from the LSB annex. These included relocating them to an off-campus site on College Road, moving them into the engineering wing, and finding additional space in the LSB and the rest of the Laboratory.

Employees with offices in the three floors of the LSB annex (1) will move temporarily to offices in trailers next to the Theory wing (2). The C-Site MG Building (3) will be renovated for machine shops, which will move from the RESA Building (4). When renovations on the LSB annex are completed, employees in Mod 6 (5) will move to the annex and Mod 6 will be destroyed. (Photo taken by drone by George Ascione)

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IOI update

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But those options proved to be too expensive or inconvenient or didn't provide enough space.

In the end, the team decided to rent trailers to create office space. Before anyone can move into the temporary offices, they will have to be fitted with sufficient electric power, communications systems, a fire detection system and the EVES evacuation system, DeLooper said.

New office space and conference rooms

All three floors of the annex will be gutted and replaced with modern office space that can accommodate more people as well as new conference rooms. The current heating and air conditioning system, which Hill said is "obsolete," will be replaced with a new energy-efficient system. "We're going to go in and refurbish the building systems and we're certainly going to make it a much nicer place to work in from an architectural point of view," Hill said.

Business operations employees in the LSB annex could move to the temporary offices as early as July. They will move first to allow them time to get settled before they begin work preparing for the end of the fiscal year report, DeLooper said. Engineers from the third floor of the annex will move to the trailers by late summer. Physicists on the second floor of the annex will move into existing office space in the main LSB, he said.

Once the renovation of the LSB annex is completed, the business operations employees will move back to the annex along with 37 employees now located in the Mod 6 trailer in the lower parking lot. The engineers from the annex would remain in the temporary offices until the renovation of the Engineering wing is completed in 2018, which will be accomplished via a separate campus plan project.

Once the employees have moved out, Mod 6 will be demolished. The building is essentially a construction trailer that was acquired in 1993 as a temporary space and has remained ever since. It is in such poor repair that there were 200 work orders over a three-year period ranging from insect infestations to HVAC repairs, according to the mission-need statement submitted to the DOE. Getting rid of the buildings will reduce PPPL's overall electricity consumption by 5 to 6 percent, according to the document.

Machine shops to move to C-Site MG Building

While work begins on the annex in October, work will also begin to renovate the C-Site MG Building. With the concrete removed from the 64,000-square-foot building, the first floor can be renovated to house the machine shops now located in the Research Storage and Assembly (RESA) Building.

A crane lifts a block of concrete into the air.

Workers completed the removal in March of the massive concrete bunker-like support structures that once housed the motor generators powering experiments in the 1980s. Contractors from R. Baker and Sons of Red Bank, New Jersey, the same company that removed the 96-ton generators in 2011, used a diamond-wire rope to cut through the cement, said Erik Perry, the construction manager. They removed 6.8 million pounds of concrete (3,400 tons) and 118,000 pounds of steel (59 tons), Perry said. Virtually all of the material was recycled. The cement will likely be broken into bits and used in roads.

The concrete removal project, which was funded by the DOE's annual General Plant Project (GPP) funds, was completed on time and within budget. "It's only impressive because of the amount of material removed and the size of the concrete pieces," Perry said.

Renovations to the MG Building include a new roof and new concrete floors to fill in both the large gaps on the first floor where the motor generators once were and the bare dirt in the basement where the concrete was. The building will also get a new heating and air conditioning system. The MG Building is "the biggest piece of the IOI project," said Steve Langish, the project controls manager and planning and control officer. "It's probably going to be more than half the cost of the project."

Storage in RESA Building

Once the MG Building is completed, the dozen technicians in the RESA Building will move to the site. The centralized location will make it easier for engineers and physicists to work with them, DeLooper said.

While the basement of the MG Building isn't being renovated in the IOI plan, the space does give PPPL the ability to expand in the future, Hill said. "What we get out of the MG renovation is the entire basement is available for use," he said. "You have 30,000 feet that can be built out later for additional shops or possibly laboratory options."

A crane lowers a backhoe into the basement of the C-Site MG Building.

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Les Hill profile

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"He has picked up the ball and really run with it," said John DeLooper, acting deputy director for operations. "He is really doing a bang-up job trying to get through all these issues to award the contract."

Les Hill

Hill, a nuclear engineer, said the job at PPPL is a good fit for his background in nuclear engineering and project management. "I remember vividly the allure and promise of fusion energy when I was in college and that was always in the back of my mind, but because I worked in commercial nuclear power I never went back to those roots," he said. "The research mission is closer to my wheelhouse, so in many respect it's bringing me back to those roots."

After getting a degree in nuclear engineering from Rensselaer Polytechnic Institute, Hill's first job out of college was working on nuclear reactors with General Electric. He was then hired by the New York Power Authority (NYPA), which ran the Indian Point Nuclear Power Plant in Westchester.

Decommissioning Shoreham Nuclear Power Plant

One of Hill's biggest challenges came when the NYPA took over the job of decommissioning the Long Island Power Authority's Shoreham Nuclear Power Plant on Long Island. Hill became the site vice president, one of the youngest in the country, and spent nearly five years on the project. The task was made more complicated by the fact that while Shoreham never fully operated, it was activated and was therefore radioactive.

Hill accomplished a similar task for the Indian Point Nuclear Power Plant in White Plains, New York. As site executive officer, Hill directed the turn-around and restart of the plant, managing an annual budget of $60 million.

After 17 years with the NYPA, Hill spent four years as a vice president at Duratek, a radioactive waste processing company in Oak Ridge, Tennessee. The company had numerous related services and $160 million a year in sales. Its operations included a radioactive waste transportation service and decommissioning nuclear power plants.

Environmental restoration at Brookhaven

When the opportunity came to move back to Long Island and work for Brookhaven National Laboratory in Upton, New York, Hill jumped at the chance. He spent 15 years at Brookhaven. For nine years, he was director of a $300 million environmental restoration project that followed the decommissioning of nuclear power plants at Brookhaven. He worked on several other projects at the laboratory, most recently as the project manager for the decommissioning of the laboratory's synchrotron accelerator facility.

A native of Deer Park in Long Island's Suffolk County, Hill met his wife Anna, who at the time was also an engineer at Brookhaven. The couple has three children: Patrick, 9, Brooke, 10, and Sara, 12. Anna now works as a tutor and stay-at-home mother and the family lives in Mount Sinai, a town on the North Shore of Long Island near Port Jefferson. The children are finishing out the school year before they all move to New Jersey.

Hill has been living in temporary quarters in the Princeton area and making the commute to Long Island on weekends. He enjoys boating and fishing; most of all, he and his wife enjoy spending time with the children. Before taking he job at PPPL, Hill saw the children off to school and never missed his daughters' lacrosse games. The new job has been an adjustment for the family but they are looking forward to moving to the area this summer, Hill said.

Hill said he has enjoyed getting to know people at PPPL. As a smaller laboratory, PPPL "has a different feel to it than a larger multi-program lab like BNL," Hill said. "Working here has been great so far and a lot of advantages that I thought I'd get here I'm getting in spades."

He has been busy working on PPPL's IOI project and is looking forward to planning the next project. "As we work our way through the IOI, I want to start working with John DeLooper on the campus plan. What's the next step? I want to work closely with John and the Lab community on figuring out what that is."

IOI update

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Once the MG Building is complete and the technicians have relocated, the RESA Building will be renovated to create storage space. The renovated space will include a new rack system capable of storing 5,000 pounds of equipment per shelf.

The new storage building will help PPPL eliminate nearly all of the 75 trailers on the PPPL campus that are being used for storage, DeLooper said. Many of the trailers are full of old equipment from decades worth of experiments and much of that equipment will also be eliminated. This would address a DOE concern about excess equipment throughout the PPPL campus, DeLooper said.

Modifying the master plan

The campus plan, with IOI as the second phase, serves as a road map for the next 10 to 15 years. The plan is being modified based on funding and the changing needs of the Laboratory, DeLooper said. "At the end of the year you readjust priorities based on mission need," he said. "You have to be responsive to the needs of the researchers."

The first phase of the plan, funded by GPP funds, included the construction of a new nanotechnology laboratory. Other projects were: repairing one of the motor generators that provides electric power to NSTX-U; refurbishing the D-Site cooling tower, and installing an elevator in the C-Site MG Building.

The third phase of the plan would renovate the laboratory space in the Radio Frequency and COB Building on C-Site for experiments currently housed in the L-wing. This will also allow the construction of facilities for lithium research that would be compliant with national codes.

In Phase IV, the L-wing would be renovated to create new office space and the Theory wing would be demolished. The exterior of the LSB and C-Site buildings facing the lower parking lots would also be renovated to give the buildings a fresh modern look.

A fifth phase would construct a new laboratory building or addition to an existing building to provide about 20,000 square feet of laboratory space if necessary.

For now, the focus is on the IOI. "It will improve the overall space," DeLooper said. "It's just creating better space and more efficient use of the space."

High-field spectrometer

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The spectrometer is one of seven diagnostics for ITER that the United States is building under the supervision of PPPL engineer Russ Feder. Engineer Charles Neumeyer, ITER Fabrication Department Head at the Laboratory, came up with the idea to use the 45-year-old coils to test the diagnostic.

The five coils are part of a device called a "dummy load" that enabled TFTR operators to test DC power supplies before connecting them to the tokamak. "They've been hanging around the Laboratory for decades," said Luis Delgado-Aparicio, a lead physicist on the project, "and they look just fine for us."

Delgado-Aparicio is working with physicists Ken Hill of PPPL and other researchers to develop an ITER diagnostic

The dummy load before technicians cut an opening into the support plate. (Photo by Charles Neumeyer)

based on the Laboratory's x-ray crystal spectrometer design that is used around the world. But the ITER assignment is particularly challenging. In ITER, the spectrometer will sit near a magnetic field that will subject the diagnostic to a powerful field of 1.9 tesla, or roughly the magnetism of an MRI machine.

That field will be 32 times higher than anything a PPPL spectrometer has operated in before. The researchers will also test the diagnostic in a field of 2.4 teslas, or 40 times higher, as a safety factor. And they will expose the device to a "time-varying" field of 3.0 teslas per second, a force comparable to what would be produced by an ITER disruption, to see if the diagnostic can survive such a violent event.

These tests are where the dummy load at D-Site comes in. The unit, located in the Field Coil Power Conversion (FCPC) building, carries up to 24,000 amps, at 2,000 volts — a power level of 64,000 horsepower — and creates very high magnetic fields.

Into this dummy load Delgado-Aparicio has mounted the spectrometer to test. The coils surround the electric pencil sharpener-sized device, which sits inside an opening that technicians recently cut into the dummy load support plate to provide access to the bore of the coils. Set before the spectrometer, just six centimeters away, is a slice of steel containing x-ray emitting iron (Fe55) for the spectrometer to detect.

The spectrometer mounted in the bore of the coils. (Photo by John Greenwald)

The tests got under way this month. In them, Delgado-Aparicio and his team are raising the strength of the current to increase the magnetic field from an initial 0.25 tesla to the far higher levels discussed above.

Working with Delgado-Aparicio to prepare and run this detailed project are engineers Nate Allen, Weiguo Que, Andy Gao and Robert Mozulay. Also participating are lead FCPC technician Jim Corl and technicians Kevin Lamb, Elliott Baer, Alexis Sanchez, Julia Weiss and Westley Reese. Cutting the opening into the dummy load support plate were technicians Bob Clark, Charlie Sands and Chuck King.

Physicists will study the data to see whether their basic spectrometer can withstand the high magnetic fields. If so, they will proceed with a preliminary design that the ITER Organization is scheduled to review in 2017.

The team testing the spectrometer, with Luis Delgado-Aparicio in the center. Clockwise from left: Jim Corl, Robert Mozulay, Nate Allen, Kevin Lamb, Elliott Baer, Alexis Sanchez, Weiguo Que, Andy Gao, Westley Reese and Julia Weiss. (Photo by Elle Starkman)

Mandatory all-hands safety meeting on Monday, June 20

There will be a mandatory all-hands safety meeting on Monday, June 20 from 1 to 2:30 p.m. in the MBG Auditorium.

Betsy Dunn, director of Environment, Safety & Quality Assurance at Argonne National Laboratory, will discuss a fatal accident that occurred last October at the Florida State University National High Magnetic Field Laboratory. Dunn led the team that investigated the accident. There will be time for questions and answers and staff will participate in an exercise based on the discussion.

Everyone at the Laboratory is expected to participate, so please plan accordingly.

Manager Toolkit provides wide range of online resources

A new Manager Toolkit is available on the PPPL Human Resources page. The toolkit provides a wide variety of resources for both new and experienced supervisors. This "one-stop shop" is structured into 10 informative topics. Each topic references an e-learning video from the Becoming a Manager learning path on Lynda.com, links to online articles and relevant Princeton/PPPL policies, procedures, and forms. Some of the topics also suggest activities that will orient managers to specific processes and supervisor responsibilities.

As an example, the first topic "New Manager Fundamentals" recommends a one-hour e-learning course that explores how to connect with your team, build trust and communicate effectively. Articles such as "Your First Day as a Manager," and "Overcoming the Legacy of Your Predecessor" supplement the e-learning course. The toolkit also has links to internal policies on ethics, compliance, work schedules and overtime, as well as a suggested activity to meet with an HR resource to understand the procedure for disability and leaves.

Supervisors are encouraged to enroll in and complete the Princeton University Management Development Certificate Program (MDCP). The PPPL Manager Toolkit is intended to compliment the MDCP and provide resources to those who may not be able to enroll right away. Supervisors are encouraged to reflect on their own areas for growth and identify topics in the Manager Toolkit that would support their development. Managers of supervisors are asked to advocate for the toolkit when discussing goals and developmental plans during the performance review cycle.

Other topics in the toolkit include "Hiring and Staffing Your Team," "Onboarding New Hires," "Performance Review Fundamentals," "Diversity & Leading with Emotional Intelligence," "Delegating Tasks to Your Team," "Leading Productive Meetings," "Managing for Results," "Building Accountability," and "Rewarding & Motivating Your Employees."

Bikers log thousands of miles in May Challenge & begin first PPPL summer challenge

PPPL's bike teams logged in nearly 5,000 miles in May as they competed in the national Bike Challenge Month and they're not done yet. The bike team is continuing the challenge with a PPPL Bike to Work Challenge this summer.

Mike Zarnstorff has started a Google group where various members can post lunchtime rides. The group is also looking into having bike repair tools and an outdoor bike repair station at PPPL. Go here to join the bike team's Google group or email Rob Sheneman, rshenema@pppl.gov for more information.

The bike team celebrated the end of the federal Bike Challenge with a picnic at Carnegie Lake on June 10 and prizes for some new members.

Bikers make their way home from Carnegie Lake. (Photo by Jeanne Jackson DeVoe)

Bike Team members walk their bike across the bridge on the Delaware Raritan Canal. (Photo by Jeanne Jackson DeVoe)

New bike team member Kenan Qu gets a prize from organizer Rob Sheneman for biking 125 miles as Mike Zarnstorff, left, and Matthew Parsons look on. Behind Qu, left to right: Jeanne Jackson DeVoe, Virginia Finley, and Prentice Bisbal. (Photo by Chris Cane)

The 41 members of PPPL's bike team logged 633 bike trips during the federal Bike Challenge for a total of 4,798 miles during May. By biking to work and around their neighborhoods, they avoided 4,334 pounds of carbon emissions and they burned 235,119 calories.

The Fusion Fun team, led by Dave Johnson, had the most average trips with 28; followed by Powered by Plasmas, led by Darren Stotler, with 25; and Fusion Flyers, led by Mike Zarnstorff, with 17. Powered by Plasmas had the most average miles with 229, followed by Fusion Fun with 172, and Plasma Peloton, led by Larry Dudek, with 154.

Logging the most trips was Mike Zarnstorff with 56 trips, followed by Marc Sibilia with 53 and Dick Majeski with 50. Logging the most miles was Dick Majeski with 614, followed by Dave Johnson with 328 and Mike Zarnstorff with 303.

New bike team members who logged the most miles received prizes this year courtesy of Halter's Cycles in Monmouth Junction and PPPL. Mia Schneller, who took 45 trips and logged in 178 miles, won a headlight; Jake Maddox, with 44 trips and 144 miles, won a Cannondale helmet; Kenan Qu with 39 trips and 125 miles, won a repair kit, and Eugene Evans with 37 trips and 141 miles, also won a repair kit.

Bike team members pose after the picnic. From left to right: William Eckstein, Carol Ann Austin, Matthew Parsons, Kathleen Lukazik, Dave Johnson, Rob Sheneman, Chris Cane, Dana Eckstein, Prentice Bisbal, Mia Schneller, Dick Majeski, Kenan Qu, Andrei Khodak, Mark Swanek, Virginia Finley, Jeanne Jackson DeVoe, William Fox and his three-month-old baby Joanna, and Mike Zarnstorff. (Photo by Chris Cane)

PPPL bids a fond farewell to a retiring employee!

ROBERT ANDRE
Senior computational scientist
Theory

RETIRED JUNE 1
AFTER 11 YEARS AT PPPL

Abandoned Bike Roundup at PPPL

Regular biking commuters to PPPL are having trouble finding space on bike racks because of the numerous bicycles that have apparently been abandoned. These are bicycles that are dirty, rusty, or have flat tires and have been left in the bike racks for some time.

In order to make room for bikers, the abandoned bikes will be tagged and owners will have until July 1 to remove the bicycles. The tagged bicycles left after July 1 will be removed and donated to a local charity. If you have any questions or need assistance putting your bike in working order, please contact Rob Sheneman, organizer of PPPL's Bike Challenge team at ext. 3392.

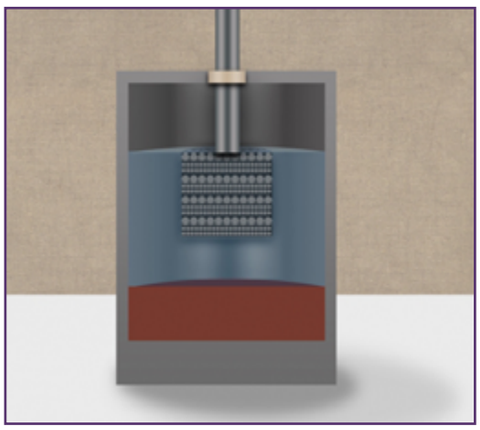
Robotics coaches needed for all-girls robotics teams

PPPL's Science Education team is looking for volunteer coaches for a new all-girls FIRST Lego League Robotics team (ages 9 to 13) and the new FIRST Tech Challenge Team (ages 13 to 18) being organized in collaboration with the YWCA-Princeton.

Please call Shannon Greco ASAP to volunteer: sgreco@pppl.gov, 609-243-2208.

COLLOQUIUM

Liquid Metal Batteries for Large-scale Energy Storage



Professor Hojong Kim
Pennsylvania State University

Wednesday, June 22
4:15 p.m., M.B.G Auditorium, Lyman Spitzer Building

BROCK

MARK GAZO
Chef Manager

Café at PPPL

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 June 20	Tuesday June 21	Wednesday June 22	Thursday June 23	Friday June 24
COMMAND PERFORMANCE Chef's Feature	**Chicken Oscar** with Crab, Asparagus & Hollandaise served with Rice Pilaf	**Stir-Fried Veggies** with Orange Sauce over Rice served with an Egg Roll	COMMAND PERFORMANCE **B&C's Steak Palace Authentic Philly Cheesesteaks** served with Fries or Onion Rings	**Baked Ziti** with Meatballs & Sausage	**Tilapia Piccata** served with Wild Rice and Vegetable
Early Riser	**Blueberry Pancakes** with Sausage	**Sausage, Egg & Cheese Croissant**	**Ham, Cheddar Cheese & Chicken Tenders** on Biscuits	**Egg, Bacon, Cheese & Porkroll Sandwich**	**Steak, Egg, Potato & Cheese Wrap**
Country Kettle	**Cream of Vegetable**	**Split Pea**	**Chicken Rice**	**Cream of Celery**	**Beef Barley**
Grille Special	BURGERLICIOUS **Old McDonald Had A Burger** Grilled Beef Burger smothered in Cheddar Cheese, topped with Sliced Ham, Fried Egg, and a Secret Sauce on a Grilled Brioche Bun	**Gyro Turkey Burger** with Gyro Meat, Feta Cheese, Lettuce, Tomato & Tzaziki Sauce on a Brioche Roll	**Grilled Salmon** on a Soft Roll with Dill Caper Sauce served with Fries	**Reuben Foot-Long Hot Dog** with Sauerkraut, Swiss Cheese, Russian Dressing with a Side of Fries	**Grilled Sourdough** with Muenster Cheese, Avocado & Roasted Peppers
Deli Special	**Grilled Portobello Mushroom** on a Kaiser Roll with Provolone Cheese, Lettuce & Tomato	**Pesto Chicken Salad Wrap**	**Bologna & American Cheese** on White Bread with Lettuce & Tomato	**Liverwurst & Onion** on Rye	**Chipotle Chicken Wrap** with Avocado Marinated in Paprika & Lime
Panini	**Kielbasa & Sauerkraut** on a Torpedo Roll served with Fried Pierogies	**Tuna Melt Panini** on Ciabatta Bread	**Turkey, Swiss, Roasted Peppers & Spinach Panini**	**Peppers, Egg, Potatoes & American Cheese** on French Bread	**Tuna Club Wrap** with Bacon & Hard-Cooked Egg

MENU SUBJECT TO CHANGE WITHOUT NOTICE

VEGETARIAN OPTION

WEEKLY
Editor: **Jeanne Jackson DeVoe** ◆ Layout and graphic design: **Kyle Palmer** ◆ Photography: **Elle Starkman**
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Comments: commteam@pppl.gov ◆ **PPPL WEEKLY** is archived on the web at: http://w3.pppl.gov/communications/weekly/.