DOE Princeton Plasma Physics Laboratory Vol. 22, No. 11 • July 2, 2001

HOTLINE

The Princeton Plasma Physics Laboratory is a United States Department of Energy Facility

Neumeyer Named "Engineer of the Year"

PPPL engineer Charles Neumeyer received the "Engineer of the Year" award from the New Jersey Society of Professional Engineers (NJSPE) on June 2 at the organization's awards and installation banquet in Somerset.

The citation for Neumeyer stated, "In recognition of your outstanding achievements in engineering, your contributions to the development of fusion as a long-term energy source, and your notable service in enhancing the prestige of the engineering profession." Neumeyer is the lead project engineer for the National Spherical Torus Experiment (NSTX).

"It is wonderful that the NJSPE has recognized Charlie Neumeyer with this award, and by association the rest of the Lab. Charlie's combination of enthusiasm and thoughtfulness is emblematic of the best we have here at PPPL," said PPPL Director Rob Goldston.

Added Mike Williams, Head of PPPL's Engineering and Technical Infrastructure Division, "Charlie has done an outstanding job leading the engineering design activity for NSTX, and having his effort recognized by the New Jersey Society of Professional Engineers is well deserved. We look forward to Charlie's continuing contributions and the recognition they will bring the Laboratory."

As NSTX project engineer, Neumeyer was responsible for integrating the many physics and engineering requirements and developing the overall engineering design of the NSTX. He was also responsible for leading the integrated testing phases which led to the first plasma operation ten weeks ahead of schedule and the demonstration of full plasma operation at one million amperes of plasma current more than nine months ahead of schedule.

Neumeyer came to PPPL in 1976. He received a bachelor's degree in electrical engineering from the University of Virginia in 1975 and a master's degree in electrical engineering from the Polytechnic Institute of New York in 1987.

Photo by Alex Ilic

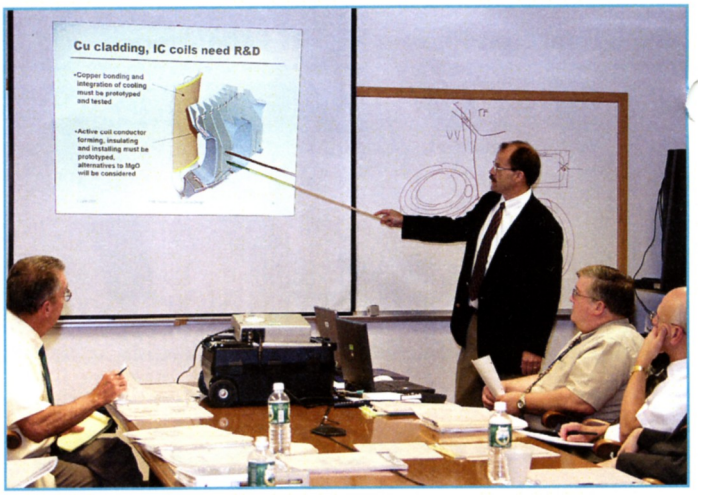
Charles Neumeyer

His career has included work both at PPPL and in industry, with specialization in the field of high-power electrical and electromagnetic systems for advanced technology research. Last year, Neumeyer was named a PPPL Distinguished Engineering Fellow and was recognized as "Engineer of the Year" by the Professional Engineering Society of Mercer County.

Upon receiving the NJSPE award, Neumeyer said, "I am accepting this prestigious award on behalf of a large group of talented and dedicated people at the Princeton Plasma Physics Lab, other national laboratories in the U.S., and still others around the world who are working in the field of plasma physics and fusion energy. As engineers, we all know that significant accomplishments always come about as the result of dedicated people working together as a team, relying on the foundation of knowledge and science created by those who preceded us in similar pursuits." Congratulations, Charles! ●

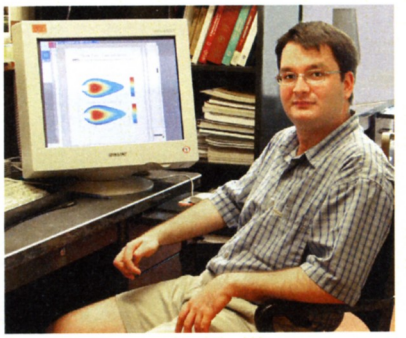
FIRE Design Reviewed

In June, an external review committee commended the pre-conceptual engineering design of the Fusion Ignition Research Experiment (FIRE) magnets, structure, vacuum vessel, and plasma facing components. Following the review, the committee recommended that additional resources be made available to conclude pre-conceptual design expeditiously. The FIRE team is preparing a plan to address several critical design and research and development issues identified during the meeting, held at PPPL. The committee included Chair Charles Bushnell, Jim Irby of the Massachusetts Institute of Technology (MIT), Saurin Majumdar of Argonne National Laboratory, Peter Mioduszewski of Oak Ridge National Laboratory, Ron Parker of MIT, Aldo Pizzuto of Frascati, and Fred Puhn of General Atomics. The charge for the review, presentations made to the review committee, and the Committee's recommendations are available on the web at http://fire.pppl.gov/eng_extreview2001.html. Above, Brad Nelson of Oak Ridge National Laboratory discusses the stress calculations for the FIRE vacuum vessel. ●



Grad Student Zaharia Receives Grimm Prize

Congratulations to graduate student Sorin Zaharia (at right), the recipient of the Ray Grimm Memorial Prize in Computational Physics for the academic year 2001-2002.



The prize recognizes Zaharia's development of useful computational tools for studies of substorms in the earth's magnetosphere, employing adaptive mesh refinement and other advanced techniques for accurate and efficient calculations. Zaharia's graduate research is in the areas of 3-D magnetohydrodynamic (MHD) equilibrium study of large structures in space, particularly of the magnetosphere, and of energetic particle injections during magnetospheric storms and substorms.

The award, given by the Princeton University Graduate School, was established in 1985 to honor Ray Grimm, a talented and popular scientist and teacher who taught computational MHD and supervised many students. It is awarded to a student in recognition of outstanding research achievements, academic merit, and creativity as a young computational physicist.

Zaharia's advisor, C. Z. "Frank" Cheng, said, "Sorin is very bright, and he can quickly grasp the key issues of his research topics and devise solutions to the outstanding problems. With his outstanding accomplishment, Sorin Zaharia well deserves the Ray Grimm Memorial Prize in Computational Physics."

Zaharia is a graduate student in the Program in Plasma Physics of the Princeton University Astrophysical Sciences Department. He is working toward the completion of his Ph.D. in the Space Plasma Physics Division of PPPL's Theory Department. In 1997, he received a bachelor's degree in physics from the University of Bucharest in Romania. His senior thesis was done as an exchange student at Uppsala Institute of Space Physics, Sweden, on a scholarship from the European Physical Society. In 1997, as an incoming student at Princeton, he received the Carl Oberman Fellowship in Plasma Physics. ●

HOTLINE

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The HOTLINE is issued by the Princeton Plasma Physics Laboratory, a research facility supported by the United States Department of Energy. It is primarily an internal publication. Correspondence and requests to reprint material should be directed to the Editor, PPPL HOTLINE, P.O. Box 451, Princeton, NJ 08543; Interoffice correspondence should be addressed to MS-38, LSB Bldg., C-Site; fax 609-243-2751; telephone 609-243-2757; e-mail pwieser@pppl.gov.

Tribute to a Genial Giant

Mel Gottlieb Memorial Draws 200 Colleagues, Friends, and Family Members to PPPL




At the Gottlieb Memorial Service in the Auditorium at PPPL are from left: Congressman Rush Holt (left) and PPPL Director Rob Goldston; top, members of the Gottlieb family; bottom: friends, family, colleagues, and staff at the service; Gottlieb's image projected on the screen.

Father figure. Mensch for all seasons. Family legend. Genial giant. Master tactician. Pioneer leader for the fusion community. That's how people described former Laboratory Director Melvin B. Gottlieb during a May 29 Memorial Service in his honor. Gottlieb, Director of PPPL from 1961 to 1980, died in December.

More than 200 of Gottlieb's friends, family members, and colleagues came to PPPL to join staff in paying their respects to the man who led the Laboratory during tremendous growth and achievement, and inspired a spirit of cooperation among staff, as well as among fellow researchers worldwide. During his 26-year tenure at PPPL, the Laboratory grew from a small contingent of investigators to a full-blown experimental facility on the leading edge of magnetic fusion research.

The memorial service took place in the Auditorium named after him, where about a dozen people offered their remarks in a celebration of Gottlieb's life.

Happy Remembrances

"This is a sad occasion, but also an occasion of happy remembrances," said PPPL Director Rob Goldston, who came to the Lab in 1972 when Gottlieb was Director. He recalled how Gottlieb's presence defined the Laboratory. "Mel was a genial giant ...There was not a single person at the Lab who did not love Mel," Goldston said.

N. Anne Davies, Department of Energy Associate Director for Fusion Energy Sciences, described Gottlieb as a father figure to staff at PPPL, as well as to the entire U.S. fusion program. She recalled how he established a high level of rapport between PPPL and Princeton University, and was a leader in international collaborative efforts. "What a legacy Mel has given all of us," said Davies.

Edward Frieman said, "Mel was an Olympic champion at worrying." Gottlieb, he explained, fretted about the future of mankind and took seriously the dream and promise of fusion power, believing it could lead to peace. Frieman is Director Emeritus of Scripps Institution of Oceanography, University of California, San Diego and former PPPL Associate Director.

Gottlieb was further lauded for his leadership and wisdom. Marshall Rosenbluth, Professor Emeritus at the University of California, San Diego, noted that with Gottlieb at the helm, the Laboratory reached a high point in creativity and prestige. "The fusion community has lost one of its most impressive pioneer leaders... Mel was a mensch for all seasons," said Rosenbluth.

Gottlieb's daughter, Paula Bastian, thanked everyone for sharing their memories of her father, whom she called a part of a most wonderful pair — her parents. Her cousin, David Mehlman, recounted his uncle's life history, from working as a teenage "soda jerk" to attending the University of Chicago, where he chose physics over medicine based on finances for schooling. Mehlman said Gottlieb, nicknamed "Bud" by relatives, was a "family legend."

Following the service, there was a luncheon held in the Lobby for guests. "May his life stand as a lesson and a blessing for all of us," said Goldston. ●

Connecting with Colleagues Across the World

Technology Makes Long-distance Communications Easy

Imagine a meeting that brings together people from various locations around the U.S. — no, the world — without any participant traveling. No hotels; no flights, trains, car rentals, or gas mileage; no per diems. And no loss of work time due to being on the road.

It's possible through a videoconference tool employed by PPPL's Media Services. A videoconference is a meeting in which participants at two or more locations are able to communicate through audio and visual links. Participants may view and listen to one another as they are speaking and presenting material. Here's how it works: a microphone and camera are used to capture the sound and video of a speaker, then the Integrated Services Digital Network (ISDN) or the internet transmits that signal to another location(s). The "far end" must have equipment similar to the Lab's, which enables both sites to communicate. ISDN is a digital service designed to carry voice, data, and video across the public switched network.

The Media Services group prepares for a videoconference. From left are John Wertenbaker, Carl Scimeca, Bob Reed, and Larry Nixon.

Site participants communicate either through a point-to-point conference like those conducted in a telephone call or through a bridge such as the Energy Science Network Bridge in California, which allows multiple sites to participate in a conference. This type of conference is known as a multi-point conference. Each site participating has its own videoconference system and uses the bridge to connect to another. A coordinator from each site tends to the links. At PPPL, Computer Operations and Multimedia Services Head Carl Scimeca and his group are responsible for videoconference arrangements. "Videoconferences save a tremendous amount of money and time that would be spent traveling to meetings," said Scimeca.

There are four videoconference systems in place at PPPL. They are in B-205, B-318, the Director's Conference Room (B-331), and the National Spherical Torus Experiment (NSTX) Control Room. In addition, the Melvin B. Gottlieb Auditorium and the DOE Conference Room (B-233) are wired for videoconferences.

Videoconference systems have connected folks at PPPL with people in England, Australia, Japan, all over the U.S., and South Africa. It is by far the most popular service requested by staff for hooking them up with other researchers or for training, said Scimeca. In the year 2000, Media Services set up 105 videoconferences. Project staff, physicists, hazardous materials employees, theorists, graduate students, and collaborators are among the requestors. "Our facilities are quite booked. We have standing weekly and bi-weekly videoconferences," said Scimeca.

For instance, on Monday mornings, staff from PPPL and the Department of Energy's (DOE's) Princeton Area Office in New Jersey "meet" with personnel from the DOE's Office of Fusion Energy Sciences in Germantown to discuss projects, hardware, and budgets, among other topics. On Monday afternoons, PPPL staff collaborating on the C-Mod experiments at the Massachusetts Institute of Technology (MIT) head to B-205 to participate in a videoconference with their MIT colleagues. Scimeca also set up the videoconference for all staff in B-318 when Energy Secretary Spencer Abraham announced the DOE budget rollout on April 9.

Media Services provides videoconference services for PPPL and collaborations at General Atomics, Oak Ridge National Laboratory, the University of Texas, the University of Washington, DOE, the Lawrence Livermore

National Laboratory, and the Lawrence Berkeley National Laboratory, among others. In addition, staff support requests from Princeton University and have accommodated employment interviews, as well as lectures. In one instance, a Princeton professor came to PPPL to present a lecture in French about coastal water management to government officials in South Africa.

Besides providing support for videoconferences, Media Services offers streaming media via Realplayer® software, PPPL telephone bridges, tape duplication, video recording, and satellite broadcasting. The Realplayer® allows people to view presentations from other locations. A camera captures the picture, feeds the signal to a computer which encodes the signal, and ships it to a server (computer). Users then connect to an assigned web address to view the broadcast. There is a 20-second delay, and users need Realplayer® software. Satellite broadcasting is available in the MBG Auditorium, enabling staff to attend training programs on topics such as hazardous materials and diversity. This system uses a satellite dish to pick up a signal, tune into a channel that offers a particular program, and broadcast it on the Auditorium screen.

Media Services staff also loan out equipment to personnel for presentations, including Liquid Crystal Display (LCD) projectors, VCRs, laptop computers, and

Members of the Media Services group are, from left, Larry Nixon, Carl Scimeca, Bob Reed, Joe Carson, John Wertenbaker, and Gary Gibilisco.

show stations. In addition, the group video records weekly colloquia, Science-on-Saturday lectures held in the Auditorium, and other special presentations as requested.

Media Services includes Joe Carson, Steve Davis, Gary Gibilisco, Larry Nixon, Bob Reed, Carl Scimeca, and John Wertenbaker. "Our team makes sure everything is working ahead of time, which involves troubleshooting and contingency plans," said Scimeca.

To book services, call ext. 3444 or send an e-mail to sysopr@pppl.gov. ●

King Children Win National Poster Contest

The children of PPPL's Margaret King, Brandon and Brittany, were among 13 national winners of the America Recycles Day Federal Poster Contest. Brandon, 7, and Brittany, 5, entered the contest through PPPL. In January, they received a congratulatory letter from former Vice President Al Gore, and in April, they received awards from the Office of the Federal Environmental Executive and the White House Task Force during a ceremony held for poster contest winners at Bolling Air Force Base in Washington, D.C. During a recent visit to PPPL, they showed their citations to staff members. From left are PPPL's Tom McGeachen, PPPL Deputy Director Rich Hawryluk, Brittany and Brandon King, PPPL Director Rob Goldston, and Margaret King. The posters of the King children are featured in the 2001 America Recycles Day Calendar, "For Our Children's Future... Buy Recycled Today." Congratulations, Brandon and Brittany! ●

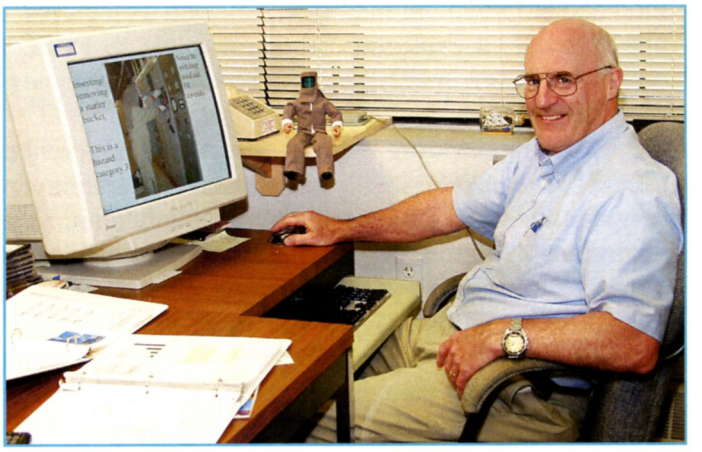
PPPL's O'Neill Develops Arc Blast Safety Training

An electric arc, which often accompanies a failure in an electric power system, reaches temperatures four times as high as that of the sun's surface, and can cause fatal burns to a person as far away as 5 feet. At a 10-foot distance, it can inflict major burns. The amount of time necessary for an electric arc exposure to cause debilitating or fatal burns to an individual is less than one-tenth of a second. Contact is not necessary for electric arcing to be fatal.

An electric arc is the passage of current through the vapor of the arc terminal material. It is usually accompanied by an intense burst of radiant energy, a high pressure shock wave, and very high sound levels.

To protect electrical workers from the ravages of electrical arcs, PPPL engineer Dave O'Neill has developed an arc blast protection program that includes a course called Electric Utilization Training. In the eight-hour course — usually divided into two half-days — O'Neill presents his material through videotapes, lectures, power point presentations, and by exhibiting protective clothing and personal protective equipment.

The sessions illustrate to electrical workers and their supervisors just how dangerous an arc flash is. One of the videos, produced by the Institute of Electrical and Electronics Engineers (IEEE), captures an arc flash through high-speed photography, showing how rapidly radiated heat can burn or seriously injure a person. Mannequins are instrumented to measure incident energy, pressure, and sound level. Tests have revealed body surface temperatures in excess of 400 degrees farenheit, pressures in excess of 2,000 pounds per square foot at the chest, with sound levels in excess of 165 decibels at the ears.



Dave O'Neill

Art Wise in protective clothing and gear as he inserts a starter bucket into a Motor Control Center.

Lab policy, following the requirements of OSHA, requires staff to carry out any electrical work with cables or conductors de-energized, unless de-energizing creates a greater hazard than working hot or is infeasible due to equipment design or operational limitations. Activities at PPPL and elsewhere that could result in arc blast exposure include taking a voltage measurement, installing or removing a fuse, inserting a starter bucket into a motor control center, and racking a circuit breaker in or out of switchgear. Additional examples are hook-stick operation of medium voltage fuses, testing of a cable terminal before grounding, grounding before testing, and work in manholes near energized cables.

"Workers need to take precautionary measures," O'Neill emphasized. "And anyone who works on or near exposed energized conductors must wear flame-resistant clothing and personal protective equipment."

Flame-resistant clothing — shirt, pants, coat, raincoat, and coveralls — is often made of cotton that has been specially treated or Nomex. The most critical function of this clothing is to withstand an arc flash without igniting (when used within its rating). Many of the arc-flash-related injuries and fatalities are caused by the ignition of clothing. Personal protective equipment includes a face shield made of polycarbonate (lexan) that is treated to give it an arc-resistant rating. An arc flash can melt a non-arc-resistant face shield. A hard hat, safety glasses, volt-

Dick DeBonis in protective clothing and gear as he operates a gang operated 138 kV disconnect switch.

age-rated gloves with leather protectors, hearing protection, fire-resistant flash suit jacket and pants, and a fire-resistant hood are additional arc protection gear that may be required depending on the task.

Since O'Neill began teaching the course last year, 96 PPPL employees and 28 non-PPPL workers and supervisors such as Department of Energy, subcontract, and other employees, have completed it here at the Lab. O'Neill has also trained 124 managers, supervisors, and workers at Brookhaven National Laboratory and 50 managers and supervisors at Argonne National Laboratory. IEEE is adopting the course as its own official training. In addition, all membrs of the staff from the Department of Energy's (DOE's) Princeton Area Office have completed the course, including Allen Wrigley.

"This training introduces electrical workers to electric arc flash hazard, motivates them to protect themselves from this hazard, and teaches them precautionary techniques and [what] clothing [is] needed to protect themselves," said Allen Wrigley. "I found the course highly interesting, and full of useful information. Because of Dave's mix of media types in presentation, the course seems to go very quickly, and generates a lot of enthusiasm, based upon the response and participation during question opportunities."

There have been no arc blast injuries at PPPL. O'Neill's goal is to keep that record. "We need to understand the bigger picture so we don't become a casualty." The prevalence of the arc flash hazard was amply demonstrated in that four arc blast accidents, injuring six workers, occurred within 50 miles of PPPL during the six-month period that the course was being taught.

He became aware of the dangers of arc blasts after viewing the IEEE video mentioned above. A seminal IEEE paper on the subject, "The Other Electrical Hazard: Electric Arc Blast Burns," written by Ralph Lee in 1982, was the first to quantify the relation between an arc blast and skin tissue damage. In the 1990s, a plethora of IEEE papers were written that became the basis for new OSHA regulations and for NFPA70E, a national consensus standard that stipulates safe work practices to protect the worker from this hazard. Before developing the course, he researched the topic, talking to several authors of original papers. "I wanted to convince electrical workers that this is a serious problem. I felt I had to develop a course and get the word out," said O'Neill, who has about 40 years of experience in the electrical power field.

He said accident data about arc blasts is difficult to obtain because flash and electrical burns are not distinguished from one another in most reports. In an electrical burn, a current goes through a person's body, burning him or her from inside. In an arc blast burn, no contact is necessary and the person is burned from the exterior.

Fear of litigation makes arc flash accident information very difficult to obtain. Consequently, much of the information about electrical arc injuries is anecdotal. One non-PPPL electrical worker was told by his supervisor that he was not allowed to discuss a recent electrical accident that occurred at the worker's facility. But the danger is real. O'Neill recounted incidents in Trenton and Newark. In one, the clothing of two electricians burst into flames as a result of an arc blast and could not be quickly extinguished, causing severe burns to both. In the other, an electrical panel exploded, severly burning two electricians, one of whom spent several months in a coma at a burn center. "An arc blast is a nasty hazard. People need to know it is there, and protect themselves by taking precautionary measures, wearing flame-resistant clothing, and using personal protective equipment," said O'Neill. ●

Dick DeBonis wears flame-resistant shirt and pants, V-rated gloves with leather protectors, a flame-resistant-rated face shield and safety glasses, and a hard hat as he takes a voltage measurement on a 120/208 volt panel.


4th OF July
Happy Birthday
AMERICA