PPPL
PRINCETON PLASMA PHYSICS LABORATORY
HOTLINE

Volume 10, No. 14 August 25, 1989

Preventative Maintenance Saves $$$

by A.R. DeMeo

Recent national studies indicate that one-third of all equipment failures can be traced to improper maintenance. Given the complexity of PPPL's magnetic fusion devices, especially TFTR with its hundreds of thousands of subcomponents, one can easily imagine the potential for downtime.

For this reason the TFTR project established a Preventative Maintenance (PM) program coordinated by TFTR Project Engineering Head Myron Norris and Administrator Louise Schaufler. This program is serving as a model for expansion throughout Tech Ops, now underway.

"Our first priority is safety for people, then high on the list is equipment critical to the operation of the major experiments," Myron Norris said. "Our primary thrust is for critical systems that keep TFTR running—large power supplies, neutral beams, computers."

PM is not just "doing something to a piece of equipment, like changing oil in a pump or calibrating electronic gear," according to Myron. "It involves training existing staff, upgrading their skills."

Team Channels Concerns

People are not hired solely to perform PM, and there is no separate PM organizational unit within Tech Ops. It is performed by staff within each division. Division Maintenance Representatives have been appointed within the TFTR Project. These people meet weekly with Myron and Louise to establish PM policy and procedures and organize PM activities. They are the points of contact for all PM within their divisions. According to Myron, "we serve as a team to organize and expedite PM. The Division Maintenance Representatives are the people who understand the requirements for PM in their organizations. They serve the best interests of the people who perform the maintenance by channeling their concerns up the chain of command."

(Photo by John Peoples)

TFTR PM TEAM: Seated (l to r): Louise Schaufler, PM Administrator; Bob Sissingh, Tritium Operations; Larry Corl, Heating Systems; Standing: Paul Hurst, Computer Division; Vincent Mastrocola, Diagnostic Systems, and Project Engineering Manager Myron Norris. Ray Pysher, PM Representative for the Tokamak Operations Division, was not available at the time of the photo.

Louise supervises a personal computer data base that provides recordkeeping, reporting, and feedback, where all PM activities are logged by people doing the maintenance. The computer issues bright orange activity cards to remind people of the required PM. When work is completed the cards come back to the computer. The information they contain is logged into the data base to indicate completed activities. Myron noted that the cards work very well. "People like to get them rather than listings or notices. The Cards command attention. It's something they can stick in their breast pocket and carry with them to the workplace."

Larry Corl, PM Representative for the TFTR Heating Systems Division, echoed this sentiment, "the cards are great, they give a name and date they've got to be dealt with." Larry noted that over the past year a lot of work has been done setting up the system. The biggest part of this job was writing procedures. This is the responsibility of the people performing the maintenance, those most familiar with the hardware. They are required to complete entry forms which are sent to Louise who sees that the information is entered into the data base from which activity cards are triggered.

Meters and other devices requiring calibration play an important role in PM and in research itself. For this reason, the use of activity cards was recently extended to remind staff of the need for routine calibration of equipment. Much of this work is carried out by the PPPL Calibration Lab under the supervision of John Gennuso.

In most cases divisional PM representatives must coordinate the preparation

Continued on Page 2

Continued from Page 1

and implementation of procedures beyond their organizational subunits. For Larry, who is a neutral-beam operations supervisor, this means dealing with folks outside of his home base, including staff responsible for radio-frequency heating and field coil power conversion. Mr. Corl feels that the strong support he received from upper management was essential for his success to date.

"Tech Ops PM Program is creating a safer atmosphere..."

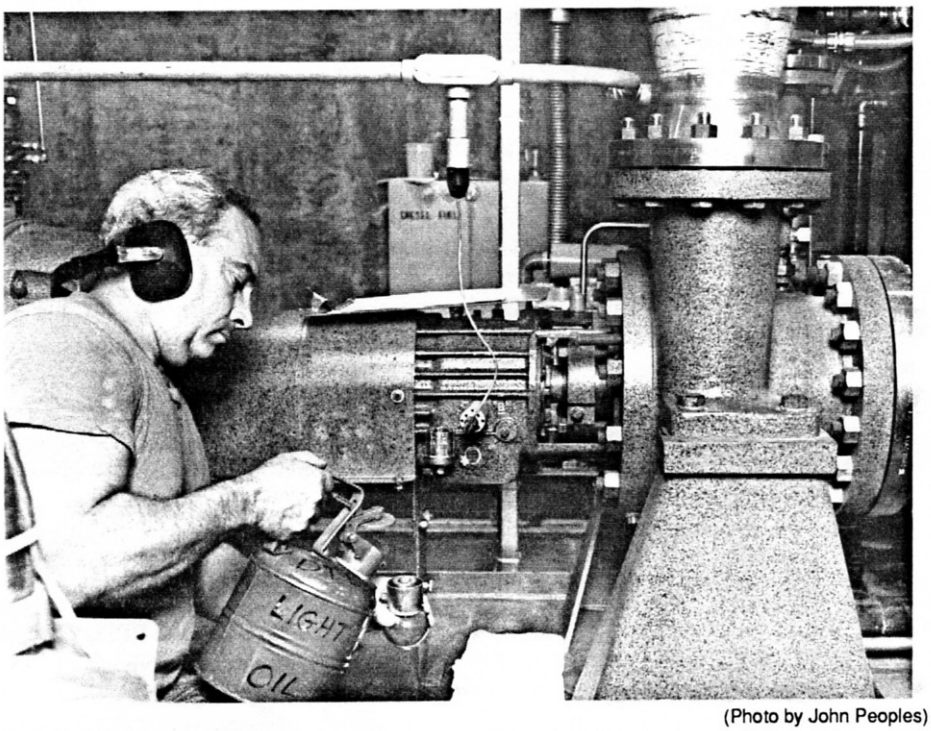
Ray Pysher, Water Systems Supervisor and PM Representative for the Tokamak Operations Division, also stressed the importance of management's involvement. He noted that the PM program is a "viable tool for management" because it identifies work that has been done, that which remains to be done, and the required resources. As with Larry, Ray's PM responsibilities extend beyond the realm of water systems to the TFTR machine, including the vacuum system, pellet injector, and ion cyclotron radio-frequency controls.

Extensive Computer PM

One of the most extensive PM programs for TFTR has been proposed by the Computer Division. It involves the 500+ power supplies which energize approximately 7000 Computer-Automated Measurement and Control (CAMAC) modules. CAMACs serve as interfaces between the TFTR's Computer Instrumentation Control and Data Acquisition (CICADA) System and individual diagnostic devices and control systems. A failure in one of the supplies could knock out as many as 25 modules, depriving physicists of important data.

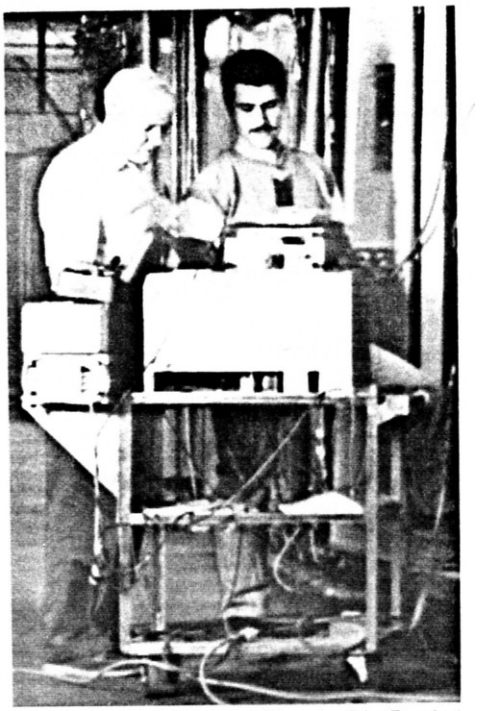
Recently Bill Bergin noticed an increased failure rate for the supplies. This prompted him to study the records where he uncovered a pattern which enabled him to identify parts likely to fail in the future. Bill notes, "there's just an inherent lifetime for these components, just like the fuel filter or tires on your car. They wear out and you've got to replace them." As Bergin's colleague Bill Rauch points out "the important thing here was to identify this problem to Laboratory management, rather than wait for more of the power supplies to fail, which would prove costly."

Rauch and Bergin have devised a plan for the phased replacement of potentially troublesome capacitors within the CAMAC power supplies. By refurbishing rather than replacing entire power supplies, a savings of approximately $2,500 per unit is estimated. The replacement plan is in addition to ongoing PM activities for CAMAC modules, which include routine cleaning of power supply filters and fans and the monitoring of voltages by PPPL's Calibration Laboratory to detect impending equipment failures.



(Photo by John Peoples)

Joe Bonfonti performs a preventative maintenance check on a 350-hp motor used in TFTR's field coil power conversion system.



(Photo by John Peoples)

Ron Barrett (left) and Michael Hoare calibrate the TFTR neutral-beam power supply modulator/regulator following preventative maintenance of the system.

Task Force

Larry, Ray, and the other divisional PM representatives comprise a task force. They audit each other routinely by conducting walk-throughs during which they check procedures and make sure that staff are properly trained. But most important, walk-throughs give staff an opportunity to express their views regarding the safety and effectiveness of the PM procedures they must implement. As Larry Corl notes, "Tech Op's PM program is creating a safer atmosphere, because it is requiring staff to follow maintenance procedures that have been carefully thought out with safety as the number one priority." ✪

The Changing Face of Forrestal

by Phyllis Rieger

During the next few months, Forrestal Campus will be undergoing a face-lift of sorts.

For now, the changes mean that some well-known landmarks will be gone. According to Lou Pizzarello, Princeton University's Manager for the Forrestal Campus, "The Gun Club and nearby garages will be demolished and the two houses across from them will also be torn down. The U.S. mailbox by the bus shelter will be relocated but where is unknown at this point; the airstrip is slated to become a heliport."

A large piece of property on the north side (PPPL side) of Scudders Mill Road, including a portion of the runway, has been sold to Squibb Corporation and will be the site of a large complex of buildings.

The face of Forrestal has changed many times from its inception as the Rockefeller Institute for Medical Research in 1914. The 850-acre tract became the James Forrestal Research Center in January, 1951, but was not officially dedicated as such until May 17, 1952. James Forrestal, a Charter Trustee of Princeton and a member of the Class of 1915, served as the first Secretary of Defense. A bronze bust of him can be seen at A-Site.

Throughout the past 38 years, many campus changes have taken place. At one time, the University maintained 24 dwellings for 24 families on this campus, including the Theobald Smith House named for the first director of the Rockefeller Institute and used as a guest house for visiting students and scientists. There were Auditory Research Laboratories, nine specially constructed buildings grouped west of Route 1, that provided facilities for studies in the nature of hearing. At one time the campus housed other special laboratories including ones for flight mechanics and instrumentation and control. The airfield consisted of a 3,000 foot landing strip and a hangar for the Department of Aerospace and Mechanical Sciences. Students performed flight experiments on the Department's aircraft and an air cushion vehicle was among the types of equipment available.

Of all of the buildings though, the Gun Club probably holds some of the fondest memories for PPPLers even though most don't know its colorful history or that it played a significant role in PPPL's experimental program. But more of that later.

(Photo by Ed Farris)

Slated to be demolished, the Gun Club will soon be gone but not forgotten.

Officially, the club is called the "Nassau Gun Club because the treasury had the stationary printed that way," according to a history of the club compiled by Archie Browne whose father Charles began the club at Tusculum, off of Cherry Hill Road in Princeton. In 1952, the club set up its headquarters on Forrestal because E.A. MacMillan, Class of '14, proposed the idea and was in a good position to do so, since he was then serving as the Director of the University's Department of Grounds and Buildings. For the first time in its history, the club found itself with an efficient kitchen (the founder an excellent cook, often honed his culinary skills on members), a tight roof, central heating and wonder of wonders—indoor plumbing. A member fired the first shot from the club's Forrestal site on December 30, 1951.

On your visit to the club you may have noticed the photos and paintings of days gone by. These mementoes with the painting of "Circe and the Swine," the carved tables, panelled bar, and other treasures will go with the membership to its new home which it's now seeking for the fifth time in its history. There are about 90 active members.

While many think of the Gun Club as a gathering place, in days gone by it often served as the site for PPPL lectures and special meetings. In October 1954, the renowned physicist Edward Teller addressed scientists at a Sherwood conference held at the Gun Club. According to Lisa Bromberg in her book, "Fusion: Science, Politics, and the Invention of a New Energy Source," in his address opening the meeting, Teller presented a new preliminary calculation about the premise of stellarator and mirror stability. His views shook the fusion community. Other discussions followed and for a time Princeton followed the plan it had charted while simultaneously exploring Teller's instability theory. By the end of 1956, however, the theoretical results were to lead Princeton to alter its program strategy significantly, putting aside for the time the rapid and straightforward progression to a demonstration reactor originally envisaged and taking up a program oriented toward experimental research.

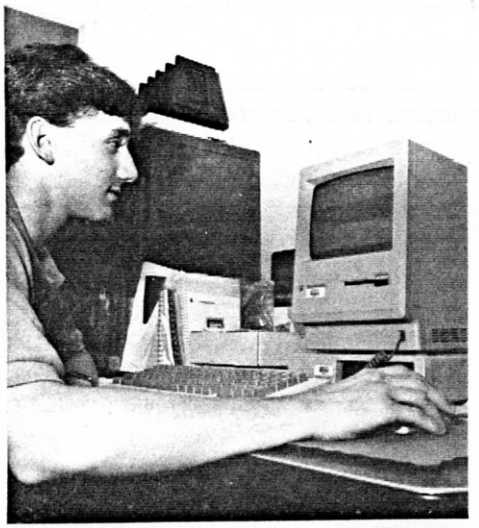
The Gun Club wasn't just a place for fine shooting and camaraderie. New and old ideas were discussed there and rehashed and re-rehashed. The little, white building, now somewhat dilapidated, will be gone but what took place there won't be forgotten. ✪

Science Intrigues Summer Students

by Phyllis Rieger

Ten top-ranked students from area high schools spent their summer exploring engineering and physics careers at PPPL as part of the Lab's Summer Science Award Program. Meg Harmsen coordinated the program which is part of PPPL's educational outreach.

In its sixth year, the program gives students like Mark Golden from Hightstown High School, "a chance to see what an engineering and physics career involves. I wouldn't be able to have this opportunity anywhere else," said the affable junior. He shared an office with Jonathan Fetter from Lawrence High School who wants to be a physicist and is enrolled at Oberlin College, Ohio, for the fall semester. Jonathan's interests include particle physics and cosmology and, "I'd like to teach one day," he said.



(Photo by John Peoples)

Hightstown High School student Mark Golden, planning to pursue an engineering career, analyzes data from a high potential test for a neutral beam ion source.

His classmate, Eliana Miller, also worked at PPPL with the neutral-beam group. She'll be going to Swarthmore College next month.

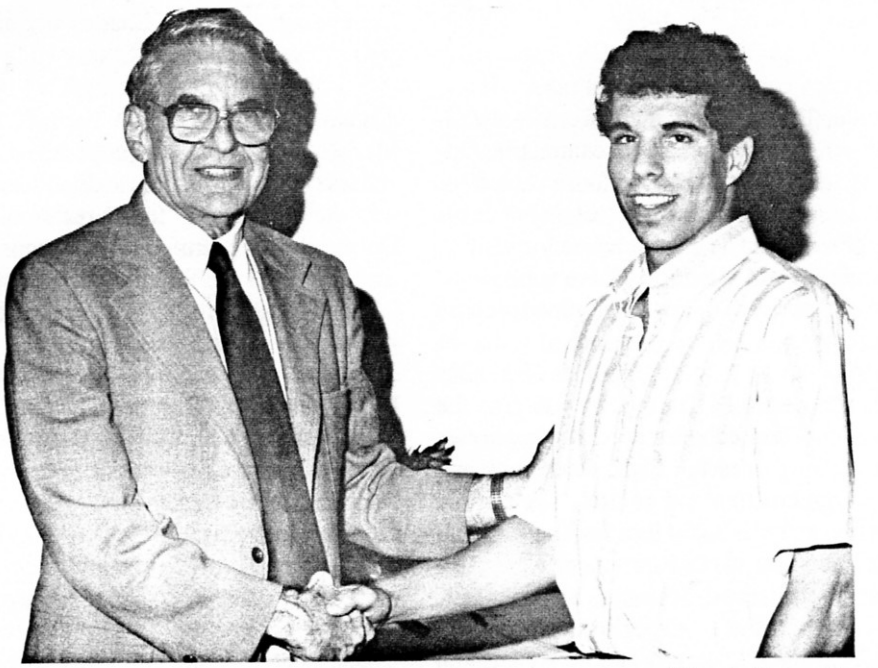
South Brunswick valedictorian Glenn Pilato "found electrical engineering interesting," so he returned to PPPL this summer. He participated in the 1988 program as well. Enrolled at Rutgers University School of Engineering for the fall term, Glenn will major in engineering "using the skills I learned at PPPL." While working here he accomplished a number of jobs including writing test procedures, performing electrical tests, and designing tests for logic boards, among other responsibilities.

(Photo by Dietmar Krause)

Discussing the TFTR at the awards evening are: (l to r) PPPL Information Services Manager Tony DeMeo, Mr. Marr, South Brunswick student Michael Marr and Sid Medley who addressed the audience.

Matthew Rockmore from Ewing High School will study physics at Penn State while Gregory Landweber from West Windsor-Plainsboro High will pursue mathematics at Princeton. Michael Marr

Continued on Page 5



(Photo by Dietmar Krause)

Deputy Director for Administrative Operations Jim Clark congratulates summer student Glenn Pilato from South Brunswick at the special recognition presentation.

Continued from Page 4

from South Brunswick finds aerospace engineering his baliwick and Arnold Engelmann from Hopewell Valley Central plans to probe world environmental problems. Ian Nyberg, from Princeton High "finds science and math intriguing," and he'll be exploring these subjects in detail at the University of Chicago this semester.

Besides their interest in science-related careers, these students share many other interests. All are involved in various activities ranging from athletics to volunteering at hospitals and churches.

Admission to the Science Award Program was competitive and based on academic achievement and recommendations from school officials. PPPL Selection Committee members included: Barry Cohen, Robert Kaita, Judy Malsbury, John Wheeler and Ken Young.

PPPL student supervisors included: George Christianson, Larry Dudek, Boris Grek, Jim Kamperschroer, Steve Kilpatrick, Tom Kozub, Greg Lemunyan, Dennis Manos, Dennis Mansfield, and Sid Medley.

PPPL Technical Assistant Greg Lemunyan, who worked with student Glenn Pilato, commented, "The program is worthwhile for both PPPL and the students. Extra help is always appreciated and the students have an opportunity to experience the work world."

PPPL recognized students on August 3 at a special ceremony with Jim Clark, Deputy Director of Administrative Operations, presenting the awards. PPPL Lab Director Harold Furth addressed the group and Sid Medley gave an overview of PPPL's program.

PPPL Seen Worldwide

by Phyllis Rieger

Cameras from Canada, Scotland, and New Jersey recently focused on fusion, and PPPL's role in particular.

Producing a show on energy alternatives, Michael Steele from Queen's Cross, Aberdeen, Scotland, said, "I was told no show on energy would be complete without a segment on PPPL." Steele directed the segment for Grampian Studios which will eventually show it on Channel 4, England, somewhat akin to our educational television. Steele said, "We plan to market the show worldwide. That's why we didn't use a narrator, so we could dub the show in a variety of languages."

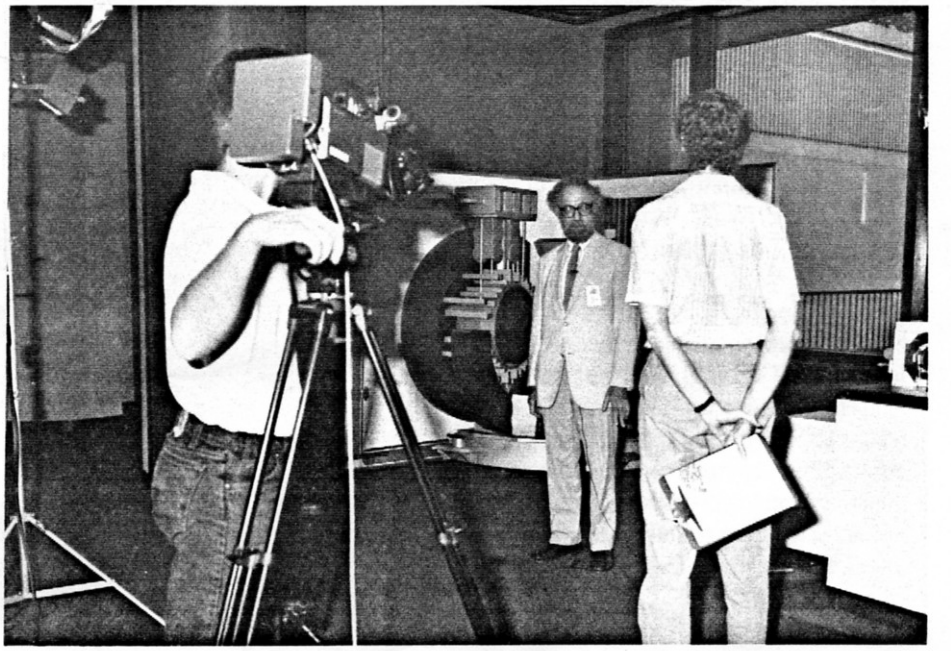
The Scottish crew marvelled at the TFTR "and the greenness of America." Production assistant Sheila Gordon said the crew didn't mind the sweltering temperatures in the high 90s "as Scotland is often damp and rainy."

Their show, called "Energy: The Alternative," includes an interview with the Lab's Director Dr. Harold Furth.

In June, a crew from the Canadian Broadcasting Company focused on fusion, including shots of the Test Cell and the TFTR Control Room. Several PPPL physicists, engineers, and technicians are featured in the broadcast to be aired in both English and French. Alain Borgonin interviewed Dr. Dale Meade as part of the segment.

Also during June, Steve Pender, an independent producer working for Jersey Central Power & Light (JCP&L), brought a crew to interview Dr. Furth on fusion and its commercial application. The segment is for "Newsbreak," a video program for JCP&L employees and it will be broadcast this month.

Information Services plans to show the segments when copies are available.



(Photo by John Peoples)

PPPL Director Harold Furth is taped by Jersey Central Power & Light crew for company's in-house video show.

TRANSITIONS

The HOTLINE offers congratulations to the following employees:

Births

Sharon Brown, PPPL Library, and her husband, Craig, whose son, Steven Joseph, was born July 19.

Connie Cummings, Accounts Payable, and her husband, Dale, whose son, Jonathan, was born July 12.

Gary Drozd, X-Ray Laser and Spectroscopy, and his wife, Marge, whose son, Jeffrey, was born August 7.

Cathy Saville, Safety Office, and her husband, Michael, whose daughter, Amanda Lynn, was born July 28.

Retirements

Steve Duritt who retired July 31 after 29 years of service. Steve was a member of TFTR Engineering and Scientific Staff.

Sam Hand who retired July 31st after 33 years of service. Sam was a Technical Associate II for PBX-M.

Grace Emma who retired August 1 after 10 years of service. Grace was a Secretary in Technical Operation's Quality Assurance Section.

Coach Crook— A Special PPPL Person

by Ed Farris

"I've been choked up with tears at least 100 times."

This describes the feelings of vacuum technician Dan Crook, who's been involved with the New Jersey State Special Olympics for the past seven years. The Summer Special Olympics, held the end of June in Princeton's Palmer Stadium, offer athletic competition for persons who have mental retardation, and physical and learning disabilities. Although geared for special athletes, the games maintain the tradition of the actual Olympics.

The 1989 NJ Summer Games were the largest in their history. More than 1600 athletes from across the state jumped, swam, lifted weights, and participated in events which included track and field, aquatics, gymnastics, softball, weight lifting, tennis, and developmental sports.

According to Dan, the Special Olympics are aimed at "getting the disabled back into the mainstream." Many area school districts have special education programs which offer athletic training. "I've been active year-round in the Mercer County program," said Dan who a few years ago earned a Special Education Coaching Certificate from the State of New Jersey. He now teaches a variety of sports, including track and field and nordic and alpine skiing. "My coaching has brought me into contact with most of the athletes in the Mercer County district, and many of them are from the West Windsor-Plainsboro community," he explained.

"I tremendously enjoy working with the athletes," he said. "I must say at first it was a bit scary and somewhat nerve-wracking. I discovered dealing with an individual who is retarded or has a learning disability means I had to think differently in terms of basics. For example, you just can't tell many of them to get dressed or get ready to go out. You have to tell them what to do and coax them along the way. You have to learn to talk in steps."

He explained his early experiences with Special Olympics were made easier with help from other volunteers, many of them the parents of the students he worked with.

(Photo by Ed Farris)

We did it! PPPL's coach Crook shares a victory smile with one of his Special Olympics participants.

"I got support from the other chaperones and from my wife, Wendy," said Dan. "They told me to just jump in feet first and get involved. And that's what I did."

He emphasized the importance of encouragement. "It's exciting to watch the progress of an athlete, especially after seeing how much hard work he/she puts into it. But the frustration level can be very high for some, particularly when they first begin training. I try to give them a lot of encouragement. When they finally reach the level where they start to believe in themselves and they start competing—that's a terrific moment. It's just great to see their success."

During the recent games Dan chaperoned three athletes. This meant he slept in the same rooms, took them to the stadium, and prepped them for the events. But most importantly, he gave them continued support. Their efforts and training paid off as the three collectively won a total of five medals, including one gold

"You bet we were thrilled. Cloud 9 never felt better," said Dan. "The Special Olympics stand for courage, sharing, and joy. Where the athletes place in competition is secondary. That they're trying is what's important. That what's make them all winners."

Those interested in volunteering for Special Olympics can call Dan Crook at ext. 2178.

(Photo by Ed Farris)

PPPL vacuum technician Dan Crook (middle) is on Cloud 9 with his Special Olympics winners and volunteers.

PPPL Publications Updated

Information Services personnel have updated a number of PPPL publications, available at the literature rack in the LOB lobby.

Information Services Department Manager Tony DeMeo edited and wrote from technical reports the recent PPPL Digest on the X-Ray Laser Microscope. The six-page digest details the progress in this field by Dr. Szymon Suckewer and his X-Ray Laser group who recently won their second Research & Development 100 Award.

An Information Bulletin on the Compact Ignition Tokamak, edited by Phyllis Rieger, outlines the genesis of this next step tokamak with principal parameters listed. A project plan is included.

A new Overview booklet, edited by Phyllis Rieger, is also available. This gives a concise description of the different Lab projects and includes sections on neutral-beam injection, computer systems and graduate education. Many PPPL personnel are featured in the photos throughout the 40-page booklet.

Working as a team, Information Service employees have coordinated the production of these publications. Graphic artist Terry Birch prepared the layouts and Greg Czechowicz produced the artwork. John Peoples, Ed Farris, and Dietmar Krause provided photos. Marilyn Hondrop assisted with word processing, and Terry Daynorowicz and Peggy Goldsmith printed some publications with Pat Buggs handling distribution.

Softball Success

"We're out of the Playoffs (Princeton Business Softball League)," said PPPL "A" Softball Coach Bob Raimond, "but we had a lot of fun."

Congratulations to the team who overall this season were indeed "a force to be reckoned with."

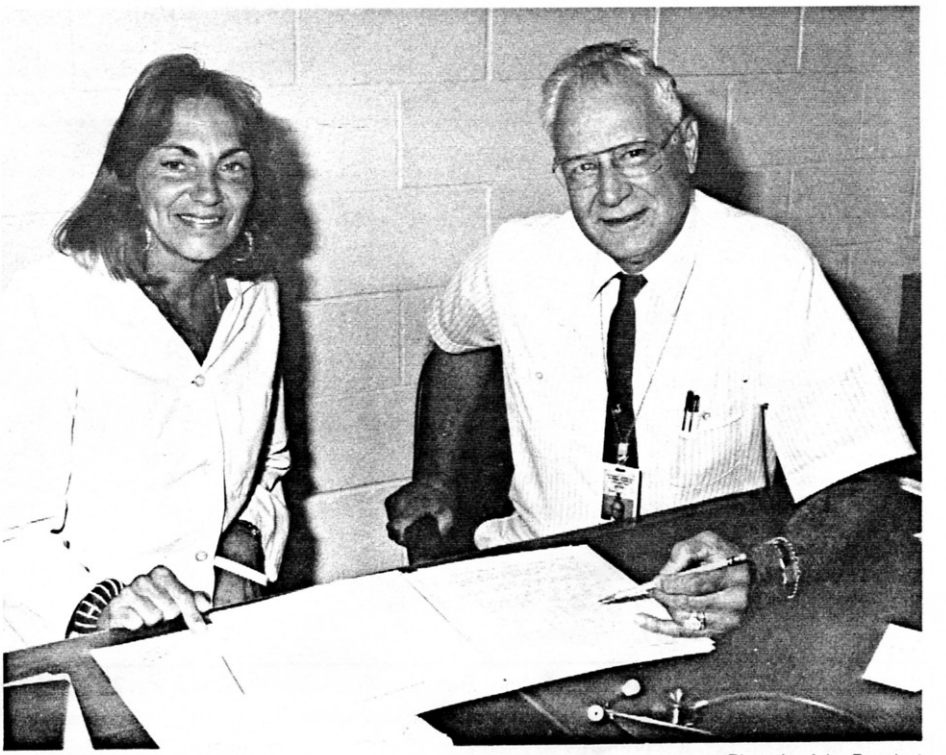
Safety Training

The Occupational Safety Branch has scheduled the following safety training courses for September:

Course	Date/Time/Location
Proper Use of Fire Extinguishers	13 Sept, 9:00-11:00 a.m. Safety Training Trailer
Respiratory Protection (Training must be repeated every year.)	14 Sept, 9:00-11:00 a.m. Training Trailer D41-5
Radiation Safety	19-21 Sept, 8:30 a.m.-12:00 noon Training Trailer D41-5
ASC Training	20 Sept, 9:00-10:00 a.m. LOB Commons or 27 Sept, 3:00-4:00 p.m. LOB Commons
CPR Training	26 Sept, 8:30 a.m.-12:30 p.m. LOB Commons

Employees must obtain permission from their immediate supervisor to attend these classes. Supervisors should call Mary Ann McBride at ext. 3468 to enroll their employees.

Basic Safety is offered every Monday at 1:30 p.m. in the Safety Training Trailer.



(Photo by John Peoples)

To Your Health. . . PPPL nurse Faith Robak discusses special project with new doctor, Dr. John Caruso who is available from 8:00 a.m. to 2:00 p.m. everyday at the dispensary.

Educational Outreach

(Photo by Ed Farris)

As part of PPPL's educational outreach, Information Officer Phyllis Rieger shows the TFTR model to Plainsboro Twp. Day Campers who ranged in age from preschool to sixth grade. She talked about fusion in simple terms and asked the youngsters to draw their idea of what the TFTR looked like before she unveiled the model she had brought along as a visual aid.

PPPL CONFERENCE ROOMS	Capacity	Contact Person	Phone
C-Site			
LOB M.B. Gottlieb Auditorium	284	Pat Buggs	2750
LOB, 3rd Floor (TFTR) (B318)	40	Kay Collins	2202
Director's Conference Room (LOB, B331)*	30	Gloria Cain	2103
DOE Conference Room (LOB, B252)	30	Sarah Thomas	3711
The Commons (LOB, 2nd Floor)	20	Pat Buggs	2750
Theory Conference Room (A168)	40	Terry Greenberg	2629
Procurement Conference Room (Rm. 111)	20	Eugenia Spears	2428
PBX Conference Room (S213)	30	Madge Mitas	3100
X-Ray Laser Conference Rm. (Rm. 245)	15	S. Wasylenko	3277
Computer Conference Room (B229)	30	Beth Ann Reardon	2416
Building 307			
Main Conference Room (Rm. 03)	60	Jean Salerno	3003
Mechanical Engr'g Conf. Rm. (Rm. 31)	12	Sonya Patterson	3469

**Subject to Director's need.*

Our best story ideas for **HOTLINE** come from you. Call Carol Phillips at ext. 2754 when you have news to report or an idea for a story.

The **PPPL HOTLINE** is issued by the Princeton University 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 Carol Phillips, Editor, **PPPL HOTLINE**, P.O. Box 451, Princeton, NJ 08543 or telephone 609-243-2754; Interoffice correspondence should be addressed to Room B366, James Forrestal Campus, C-Site.

Produced by Gregory J. Czechowicz.