PPPL HOTLINE
PRINCETON PLASMA PHYSICS LABORATORY

Volume 11, No. 4 December 12, 1989

Update

Energy Conservation at PPPL

(Photo by John Peoples)

PPPL's Energy Management Team is comprised of (left to right) Bob Gulay, Dick Rossi, Rich Pfeifer, and Jim Clark. The success of our In-House Energy Management Program "is due to the cooperation and hard work of the entire Laboratory staff and to the commitment and support of all levels of Laboratory management," said Rossi.

According to the PPPL Energy Management Team and U.S. Department of Energy (DOE) Quarterly Energy Conservation Performance Report, the Laboratory continues to be a winner in its battle to conserve energy and reduce energy-related costs. Comparing FY89 energy usage costs with FY85 (the base year against which energy savings are measured), $503,800 was saved in electrical and $41,700 in fuel oil costs (Table I). Coupled with the $847,200 savings from the PSE&G Interruptible Service contract, $1,392,700 was saved in FY89.

Dick Rossi, Associate Director and Head of the Administrative Department, said, "It's very gratifying to achieve these savings for the Laboratory. They show that our In-House Energy Management Program is working. This success is due to the cooperation and hard work of the entire Laboratory staff and to the commitment and support of all levels of Laboratory management."

In fiscal year 1985, DOE initiated and PPPL began a new 10-year energy conservation program. Under this program, an energy reduction of 10% in Buildings, Experimental Operations, and Vehicle/Transportation must be achieved. According to Rich Pfeifer, Head of Plant Maintenance and Engineering, "We are faced with a major challenge. Even though we have 10 years to meet the mandated reductions, our success will require ingenuity, hard work, and the continued support of everyone. However, I believe PPPL will continue to meet DOE's energy reduction requirements, just as we have in the past."

"We're off to a good start," confirmed Bob Gulay who is in charge of energy management conservation for the Laboratory. He said, "Several major accomplishments were realized in FY89. When converted to British thermal units per square foot — a unit of heat energy — and averaged FY85 base year to FY89, PPPL achieved reductions of 10.7% in Buildings, 11.1% in Experimental Operations, and 43.4% in Vehicle/Transportation. These reductions mean that the Laboratory is well on its way towards meeting the across-the-board energy reduction goal of 10% by 1995. However," cautioned Gulay, "any statistically bad year could disrupt this Laboratory's successful energy conservation position."

Table II shows the Laboratory's reduction in energy and heating for buildings for the FY85-89 period. According to Pfeifer, "These reductions are mainly attributed to smart energy management, innovative energy conservation engineering tech-

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Table I. Energy Cost Savings in FY89.

Electric (FY89 vs FY85)	$503,800
Heating Fuel (FY89 vs FY85)	$ 41,700
PSE&G Interruptible Service Contract (FY89)	$847,200

(Note: These figures do not reflect a yearly savings of approximately $1,200,000 due to energy conservation projects already in place prior to FY89.)

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niques, the Laboratory employee energy awareness program, sophisticated computer-controlled energy management systems, and in-place operating energy retrofit projects."

Gulay said, "Experimental Operations has always been one of the most difficult areas in which to effect energy conservation. Comparing FY89 to the FY85 base year, TFTR, PBX-M, the Current Drive Experiment (CDX), and other PPPL experimental devices where able to maintain, in concert, successful research programs while holding their energy consumption down — only a two tenths of one percent energy increase was recorded. Most remarkably, in FY89, TFTR increased its total plasma shot attempts by a whopping 18.4% compared to FY85! Yes, Experimental Operations made a significant contribution to the Laboratory's conservation program. This is a good example of preserving Laboratory funds while maintaining the Laboratory's mission."

Continuing, Gulay pointed out, "The TFTR energy savings were achieved through the strong management efforts of Rich Hawryluk (Head of TFTR Tokamak Operations), Dave O'Neill, TFTR's Chief Operating Engineers, Tom Browning, and the TFTR Physics Management and support team. The savings were realized primarily because electrical demand was optimized by careful pre-planning of operations; because monthly electrical demand goals were set and met; because of stringent device time management; and because the maximum number of shots per hour of machine operation were obtained. Similar conservation efforts were practiced on the other experimental devices."

Summing up, Jim Clark, Deputy Director of Administrative Operations, said, "Employee support for our energy conservation projects has had significant impact on our ability to reach our energy conservation goals and maintain our Laboratory's mission. As our conservation program succeeds, our research and experimental programs reap the benefits. A hearty 'well done' to everyone, and keep up the good work!"

PPPL has been doing a good job conserving energy, but in today's environment of reduced budgets, it is important to complete the outstanding energy projects as soon as possible, in order to save even more energy and dollars, to provide more operating funds for salaries and experimental work.

Bob Rodgers
In-House Energy Manager
Program Coordinator
Princeton Area Office

Table II. Energy Reduction Goals and Results for Buildings (FY85-FY89).

Energy Usage	Buildings FY85	Buildings FY89	Energy Goal	Year-to-Date Change Average
Energy Consumption (10^3)(Btu/ft^2)	620	517	-10.0%	-10.7%
Heating (10^3)(Btu/ft^2/HDD)	20.8	19.3	-10.0%	-8.3%

(Note: Btu/ft^2 = British thermal unit per square foot.
HDD = heating degree days.
Fuel oil used FY85-87.
Natural gas and fuel oil used FY88-89. All energy converted to Btu for comparison.

Energy Awarness Observed in December

"Energy Builds a Better America," is the theme of this year's DOE energy awareness poster, which is on display around the Laboratory. The poster was especially designed to remind everyone of the importance of energy and the need to continue to use our energy resources wisely and efficiently. It emphasizes the essential relationship between energy and a better life for all of us.

On the poster, the flag — symbol of our Nation — flies above a stylized landscape with composite city skyline, recognizable monuments, and natural features representing various regions of the country. The theme, in bold type at the top of the poster, makes the simple but compelling statement that America's abundance, now and in the future, rests upon a foundation of secure and abundant energy.

"PPPL has been very successful in its conservation efforts," said Dick Rossi, Associate Director and Head of the Administrative Department. He explained, "We have had a highly successful energy conservation program for many years. We are presently about halfway through a ten-year plan that calls for a 10% reduction in three areas: buildings, experimental operations, and vehicle/transportation. So far, when averaged against the FY85 base year, we have realized reductions of 10.7% in buildings, 11.1% in experimental operations, and 43.4% in vehicle/transportation. These statistics translate into a 'good

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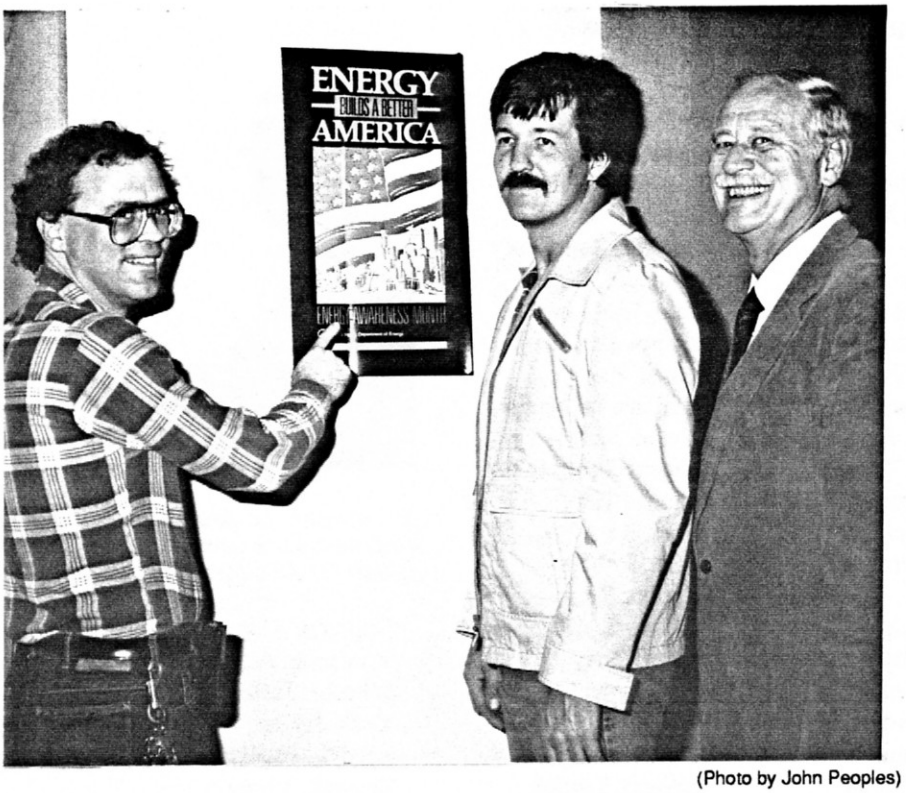

(Photo by John Peoples)

Rich McDonough (left), Mark Kijek (center), and Bob Rodgers are part of a team who help make energy conservation work at PPPL. Mark is supervisor of the Heating, Ventilating, and Air Conditioning section (HVAC) in Plant Maintenance and Engineering, and Rich is a HVAC technician. Bob is the In-House Energy Manager Program Coordinator for DOE's Princeton Area Office.

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start,' however, we're only about halfway to the finish line, and a bad year could change the Laboratory's clearly excellent energy conservation report card." Rossi added, "PPPL has an important role in the nation's long-term efforts to provide energy without creating environmental problems. In the near-term, as a major energy consumer, it is important that PPPL continue practicing good energy conservation."

The Laboratory will be observing December as Energy Awareness Month.

Red Cross Honors PPPL

Dr. John Caruso, PPPL's Medical Director, recently received a plaque from the American Red Cross recognizing PPPL's outstandingly successful blood drive this fall and a personal thank-you note from James Moffat, American Red Cross Recruitment Representative. "Many thanks for your leadership in an outstanding blood drive in September. Please extend this thank you to everyone at PPPL who made this life-saving event possible," Moffat said in his note.

"The response by the Laboratory personnel to this blood drive was an extremely warm and pleasant surprise. Blood donating truly is giving of one's self for benefit of others. A real personal satisfaction. Well done PPPL!," said Dr. Caruso.

PPPLers who donated blood are:

Allen, Halsey
Anderson, John
Anderson, Michael
Baker, Eugene
Bartsche, Lisa
Bartzak, Joseph
Bateman, Glenn
Bayes, Trevor
Bebb, Russ
Bergmann, Dolores
Bernett, Olga
Bernhardt, Valentine
Bodinizzo, Richard

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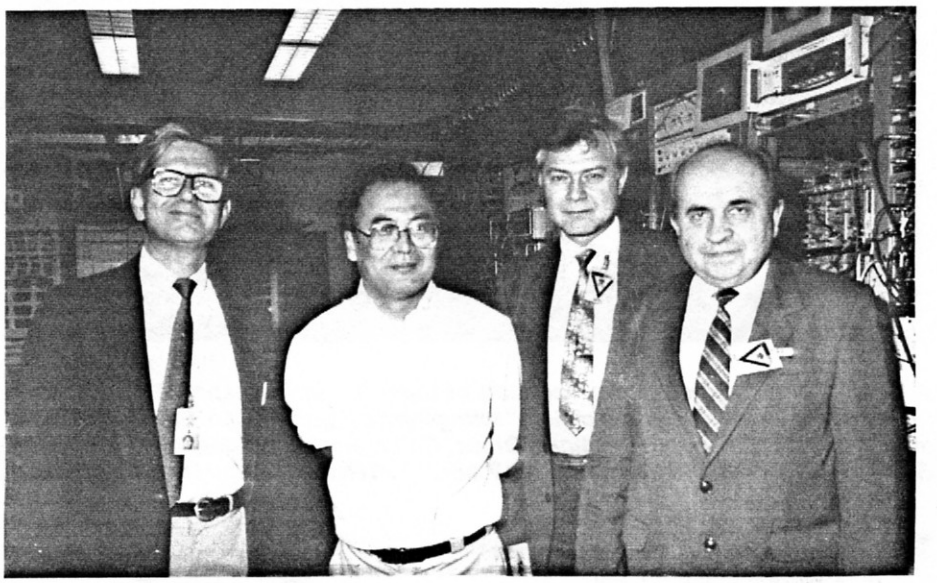

(Photo by John Peoples)

Academician B.B. Kadomtsev (right), Director of the Plasma Physics Department, I.V. Kurchatov Institute of Atomic Energy, Moscow, USSR, and Dr. V.A. Chuyanov (second from right), Head of the Technology Division of the Plasma Physics Department, visited PPPL in November. Drs. Kadomtsev and Chuyanov were returning from a meeting of the ITER (International Thermonuclear Experimental Reactor) International Scientific and Technical Advisory Committee (ISTAC), held at the University of California at Los Angeles. Dr. Kadomtsev is Chairman of the ISTAC, and Dr. Chuyanov directs the work on ITER in the USSR. At PPPL, Dr. Kadomtsev presented a colloquium titled "Phenomenology of Ball Lightning and Self-Organization in Tokamaks." With Drs. Kadomtsev and Chuyanov are Paul Rutherford (far left) and Michio Okabayashi.

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Bunting, Carl
Candelori, Michael
Cargill, Richard
Chu, James
Cole, John
Colestock, Partick
Connell, Sally
Czeizinger, Thomas
Daugert, Richard
Davenport, Joseph
Delgavio, Sherry
Denne, Boel
Devine, Thomas
Drozd, Gary
Dudek, Lawrence
Fleming, Robert
Frankenfield, Richard
Fuchs, Rosemarie
Gettelfinger, Geoffrey
Gillars, Chris
Gould, Roger
Graber, Dennis
Guyet, Allan
Henkel, James
Holcombe, Spencer
Holt, Rush
Hurst, Paul
Ilcisin, Kevin
Juhasz, Alex
Kilpatrick, Stephen
Krushelnick, Karl
Lanzi, James
Larson, Scott
Lawson, Matt
LeBlanc, Benoit
Mastrocola, Vince
McBride, Mary Ann
McCormack, Brian
McGeachen, Thomas
Mitman, Eugene
Mole, Michaela
Morales, Hector
Mount, John
Oldaker, Mark
Olivieri, Daniel
O'Malley, Richard
O'Neill, David
Palladino, Anne
Palladino, Richard
Pecht, Frank
Peoples, John
Perry, Erik
Phillips, Carol
Potensky, Carl
Quadland, Kenneth
Ramsey, Alan
Reardon, Beth Ann
Reynolds, William
Ritter, Christine
Roberts, Donald
Rosser, Roy
Schechtman, Nathan
Schoen, Stanford
Schoeneck, Joseph
Schultze-Berge, Sibylle
Silber, Kenneth
Smart, Robert
Stratton, Brent
Strykowsky, Ronald
Sutton, Larry
Synakowski, Edmund
Tompkins, Gregg
Towner, Harry
Troyano, Stanley

(Photo by John Peoples)

Dr. Caruso is proud of the special American Red Cross plaque PPPL received for its successful blood drive.

Upperco, Alan
VonHalle, Alfred
Whitley, Justine
Yeck, James
Zeedyk, Patricia
Zelenak, Virginia

(Photo by Dietmar Krause)

We did it! Working as a team, the staff of the Plant Maintenance & Engineering (PM&E) Division earned an "excellent" rating from a Department of Energy appraisal team from the Chicago Operations Office. Celebrating the good news are PM&E Supervisors: (l to r) Dick Terhune, Pich Pfeifer, Carl Potensky, and Wayne Robinson.

TRANSITIONS

The HOTLINE offers congratulations to the following employees:

Promotion and Reassignment

John DeLooper has been promoted to Head, Quality Assurance and Reliability, reporting directly to Deputy Director for Technical Operations, Tip Brolin. He replaces **Harry Howard** who is on special assignment to both Brolin and Richard Rossi, Associate Director and Head of the Administrative Department.

Births

Doug LeBon, TFTR Neutral Beams, and his wife, Carla, whose daughter, Hannah Rebecca, was born October 23.

Elaine Lu, Engineering Analysis Division, and her husband, Jason, whose son, Alfred, was born October 19.

Andrew McInerney, Computer Division, and his wife, Theresa, whose son, Robert, was born November 20.

Paul Snook, CIT, and his wife, Laura, whose son, Connor, was born November 22.

The Inimitable Don Grove

by Phyllis Rieger

When does six months on a special assignment turn into a 36-year career? When you're Donald J. Grove.

Don retired from his position as Head of Research and Development for CIT in November. But those who know him suspect that he will never really retire. Don noted, "I hope to continue an association with the Lab."

He explained how he first came to PPPL. "It all started in 1954 when I came on loan to PPPL from the Westinghouse Electric Corporation. My family and I were living in Pittsburgh; in fact, my wife, Dane, and I had just bought a new house.

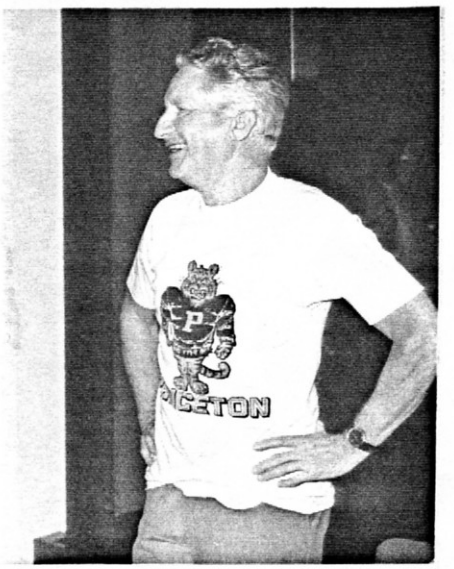
"I was asked to come here by Dr. Lyman Spitzer, PPPL's first director, who was eager to bring industrial scientists into the fusion field. At one point I was convinced I wasn't the right person for the job because I felt a person with extensive engineering skills would be better suited to the project. I never dreamed Princeton would become home."

Physics—Early Interest

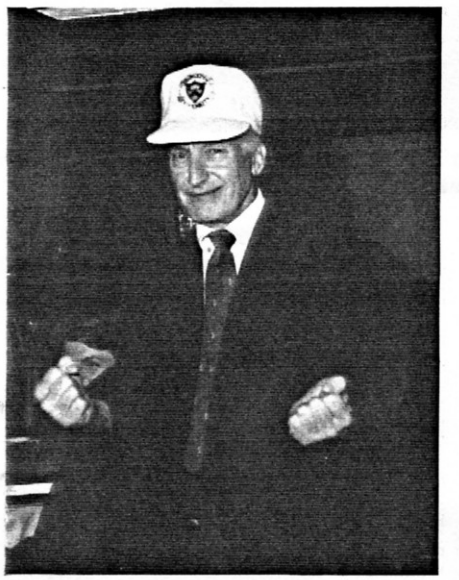
Don explained his interest in physics and engineering started when he was a high school sophomore. "I always liked to take things apart and see how they worked, like clocks and locks," said Don. He studied mathematics and physics at the College of Wooster in Ohio, then went to the Massachusetts Institute of Technology (MIT).

"MIT had a special program directed toward students from small colleges interested in physics. I was one of four small college representatives from all of the United States chosen to participate, but World War II was on and it was difficult to continue," he pointed out.

In the summer of 1942 he worked on classified projects at Westinghouse, eventually going to school half-time and working full-time. While working on his Ph.D. thesis full-time, he worked at Westinghouse half-time. "My wife mowed the grass, shoveled the snow, etc.," said Don. "Without her, I couldn't have done it." He obtained his Ph.D. degree in Physics from Carnegie Mellon University in 1953. His thesis focused on the synchrocyclotron, a particle accelerator that involved many interesting aspects of vacuum, electricity and magnetism.



In 1982, after nearly thirty years at PPPL, Don became an "offical" Princeton University employee when he joined the Lab as a Principal Research Physicist.



Don has always had the "can do" spirit.

He picked Westinghouse as an employer because a friend of his father mentioned to Westinghouse personnel that Don had an interest and background in some work the company was doing. He work for the Plasma Physics Laboratory as a Westinghouse contract employee until 1982 when he officially became a University employee.

The banner says it all — Good Luck Don!

Held Several Positions

Throughout his career at PPPL Don has held a number of positions. From 1960 to 1970, he was the physicist-in-charge of C-Stellarator operations. He managed the entire facility and generated more than 50 papers on plasma physics and controlled thermonuclear research. From 1970-1972, he managed a crash conversion of the C-Stellarator to the Symmetric Tokamak and oversaw operations for the project.

Next he became Project Manager for the Princeton Large Torus, responsible for its design, fabrication, installation, and physics operations. He joined the TFTR project in May, 1976, as Deputy Project Manager and became Manager in November, 1982 after retiring from Westinghouse and joining PPPL as a Principal Research Physicist.

"Each device was a super event of the time but I had the most fun converting the C-Stellarator to a tokamak."

In October, 1986, he became Deputy Director for Technical Operations, and, anticipating retirement, stepped down in January, 1988, to work on special assignments involving the University, the U.S. Department of Energy, and community officials.

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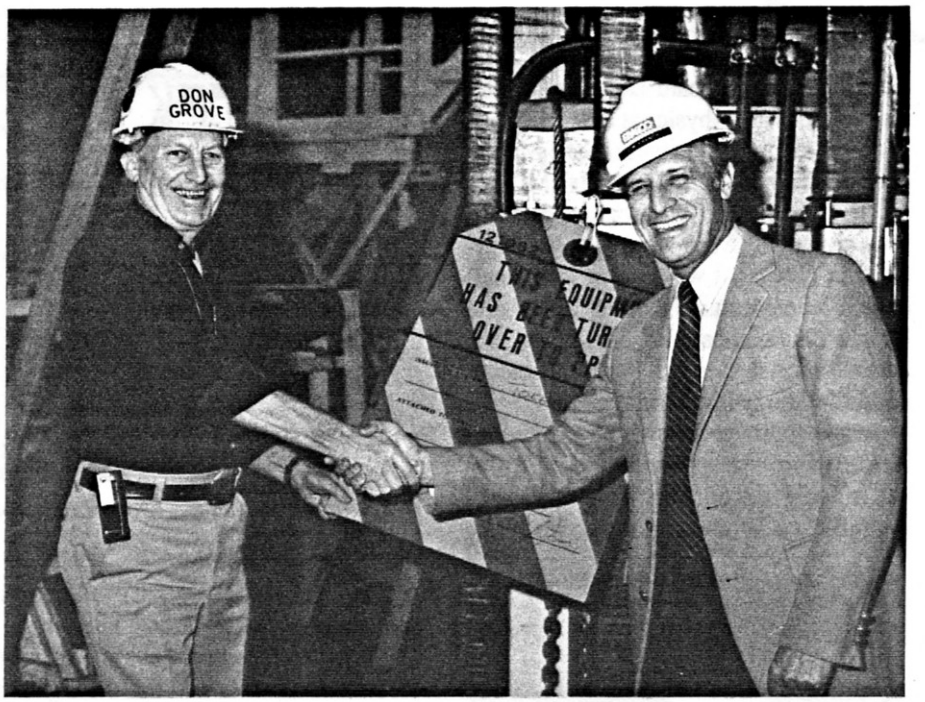

Don Grove , representing PPPL, "accepts" the Tokamak Fusion Test Reactor from Jim French, representing Ebasco Services Inc.

According to Don, "Each device was a super event of the time but I had the most fun converting the C-Stellarator to a tokamak. It was an exciting time for the fusion community. We were getting the first real support for tokamak physics in this country."

He continued, "In those days, you could do things more quickly. Four of us—John Boychuk, Jack Joyce, Wolfgang Stodiek, and I—flew it by ear for the stellarator conversion. We'd make little sketches and often solved very difficult problems with on-the-spot ingenuity."

In 1958 the United States, the Soviet Union, and Great Britain all declassified their fusion research programs, in time for the Second Atoms for Peace Conference, held in Geneva. Don feels this was the start of a new beginning for fusion researchers. "Essentially,we discovered that all countries, including the Soviet Union, were working along the same lines," said Don.

"I always liked to take things apart and see how they worked, like clocks and locks."

Another event that will always be a part of PPPL's and Don Grove's history is the look of undisguised joy on his face as TFTR achieved first plasma. "That was quite an unforgettable time," he said.

He has a number of "souvenirs" to remind him of his illustrious career. One of them is a part of the vacuum vessel for the B-3 Stellarator which is only 2" in diameter, quite a contrast to today's machines.

Active Person

What will he do with his spare time now? "Well, I'll continue with some of my 'outside' activities," explained Don, who plays bridge, bowls on the University Bowling League, and plays in the Golf

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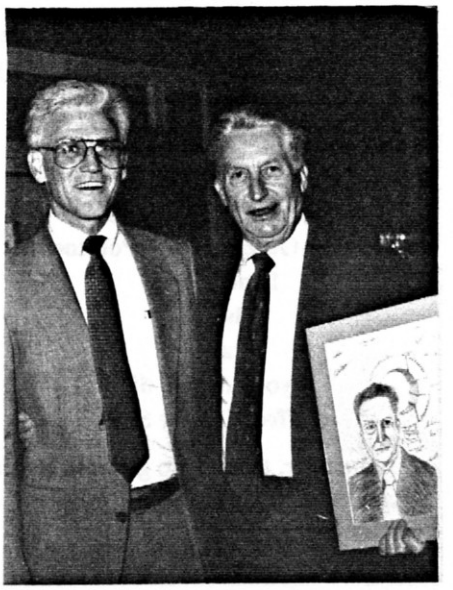
Time stood still waiting for TFTR to achieve first plasma. The clock was stopped at 1:54 a.m. on December 24, 1982, and it wasn't until 3:05 a.m. that the historic event took place. Undisguised joy registered on Don's face when first plasma was achieved.

League. He said, "My mechanical skills will be put to good use keeping my 1967 Ferrari in tip-top running condition."

He'll also have more time for his three children and seven grandchildren. His youngest son, Bob, followed in his dad's footsteps, getting his Ph.D. degree in Physics. His oldest son, Jim, is a chemical engineer. He often sees his daughter, Ellen, who lives in Princeton as Don does.

"PPPL though is an important part of my life," said Don. We know that and we know that Don Grove plays a major role in the history of PPPL and fusion. His contributions will not be forgotten.



At the retirement dinner, Milt Johnson (left), Manager of the USDOE Princeton Area Office, give Don a pencil sketch he made of Don in front of a TFTR toroidal-field coil.

Dale Meade (right) presents Don with the TFTR "Flashing Hat Award." According to Dale, "only the most outstanding contributors to TFTR are given this award." Interestingly, the hat was first given to Don by his daughter, Ellen, and Don gave it to TFTR. When given the hat, Don asked, "Can I keep it." Dale replied, "only if you really retire, otherwise you have to give it back."

Tips for a Safe Holiday

Even though you are in a rush shopping, **stay alert** to your surroundings and the people around you.

Shop with a friend whenever possible.

Avoid carrying large amounts of cash.

Pay for purchases with a check or credit card.

Be extra careful with purses and wallets. Carry your purse tightly under your arm and don't leave it unattended, even for a minute.

Don't display gifts where they may be seen through a window or doorway.

Be extra cautious about locking doors and windows when you go out, even for a few minutes.

If you go away, **have a neighbor watch your home** and pick up newspapers and mail. Get an automatic timer for your lights.

PPPL Holiday Schedule

The Laboratory Council has approved a Laboratory closing during the December holiday season. The dates of the closing are Monday, December 25, 1989 through Monday, January 1, 1990:

Monday	December 25	University Holiday
Tuesday	December 26	University Holiday
Wednesday	December 27	Laboratory Closing
Thursday	December 28	Laboratory Closing
Friday	December 29	Laboratory Closing
Monday	January 1	University Holiday

All staff members have the option to charge three days, December 27, 28, 29, as vacation or to use their Optional Holidays. Because New Year's Day falls on Monday in 1990, one of the usual designated holidays around New Year's has been changed to an optional holiday; therefore, there are three optional holidays instead of two for 1988-1989.

Exempt staff members will receive their December paycheck on Wednesday, December 20th; bi-weekly paychecks will be distributed on Friday, December 22nd; Hourly staff can pick up paychecks in the Payroll Office, Mod II, Friday, December 29th between 9:00 a.m. and 1:00 p.m.

If you have any questions, please contact Steve Iverson on ext. 2007.

Cafeteria Menu Week of December 11

Item	Monday	Tuesday	Wednesday	Thursday	Friday
Soup #1 ($.80)	Chicken Noodle Low sodium	Cream of Mushroom	Beef Barley	French Onion	New England Clam Chowder
Soup #2 ($.80)	New England Clam Chowder	Chicken Noodle Low sodium	Cream of Mushroom	CHRISTMAS SPECIAL:	Lentil Tomato
Entree #1	Rare Roast Beef w/Vegetable $2.95	Spanish Meatloaf w/Vegetable $2.70	Linguini w/Clam Sauce & Garlic Bread $2.70	Boneless Breast of Capon w/Apple Stuffing, Green Beans Almondine,	Catch of the Day w/Vegetable $2.85
Entree #2	Knockwurst w/Hot German Potato Salad $2.65	Chicken Supreme w/Vegetable $2.75	Breaded Pork Chop w/Vegetable $2.75	Honey-Glazed Sweet Potatoes, Dinner Roll, Sherbet,	Beef Stroganoff w/Noodles $2.85
Dieter's Special	Broiled Flounder w/Veg. & Roll 273 Cal. $2.95	Oven Roasted Chicken w/Veg. & Roll 287 Cal. $2.75	Cold Seafood Salad Platter 295 Cal. $2.25	Coffee, Tea, or Soda (12 oz.) $3.99	Broiled Fish w/Veg. & Roll 273 Cal. $2.85
Hot Sandwich	Bacon-Swiss Burger w/French Fries $2.45	Grilled Cheese w/Tomato $1.45	Grilled Pork Roll w/Cheese $1.39	NO GRILL	The Hoboken $2.25
Cold Sandwich	Ham, Salami, Swiss on Rye $1.90	Bacon, Lettuce & Tomato $1.95	Pita Stuffed w/Tuna $1.98	COLD SANDWICHES WILL BE AVAILABLE	Ham & Swiss Sub $1.98
Salad by the Ounce (18¢ per ounce)	Potato Salad	Zucchini w/Tomatoes	Pasta Salad	Antipasto Salad	Fresh Garden Salad
Breakfast Specials	2 Eggs, 2 Bacon, Toast, Small Coffee $1.90	3 Pancakes, 2 Bacon, Small Coffee $1.93	Cheese Omelet, Toast, Small Coffee $1.80	2 Eggs, Sausage, Cheese on Kaiser, Small Coffee $1.93	2 French Toast, 2 Sausage, Small Coffee $1.80

NOTE: Effective Jan. 2, Hot Oatmeal will be served daily at breakfast.

Holiday Feast Highlights Cafeteria Menu

On Thursday, December 14, the Cafeteria will be featuring it's special holiday menu. For only $3.99 you feast on:

Boneless Breast of Capon
Apple Stuffing
Green Beans Almondine
Honey-Glazed Sweet Potatoes
Dinner Roll
Sherbet
and
(your choice of)
Coffee, Tea, or Soda

Remember, there is no grill service on special menu days. Cold sandwiches will be available.

Emergency Closing Information

On those occasions when the Laboratory will be closed for the day or the normal starting time will be delayed (late opening), special announcements will be made over the following radio stations:

Princeton	WHWH	1350 kHz
Trenton	WTTM	920 kHz
Trenton	WPST (fm)	97.5 MHz
Levittown	WBCB	1490 kHz
New Brunswick	WCTC	1450 kHz

PLEASE REMEMBER: When Princeton University is mentioned, the announcement also includes the Plasma Physics Laboratory.

The University begins monitoring weather conditions as early as 4:00 a.m. and arrives at the decision to open, close, or have a delayed opening as early as practical. PPPL does not independently arrive at its own decision to open or close.

The Laboratory has installed two answering machines to provide an emergency telephone number to call to determine whether the Laboratory will have a delayed opening or other actions as may be required. Please call this emergency number only if you are unable to receive radio broadcast announcements. The answering machines' telephone numbers are 609-234-2034 and 609-243-2035.

In the event that PPPL remains open, employees who find it impossible to report to work because of hazardous conditions should notify their supervisors as soon as possible that they are unable to report to work.

PPPL

Princeton Plasma Physics Laboratory

Our best story ideas for HOTLINE come from you. So if you have an idea for an article, call Carol Phillips at ext. 2754.

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 Carol Phillips.

Happy Holidays!