HOTLINE
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INTER-OFFICE CORRESPONDENCE

Princeton University: DEPARTMENT Office of the Director Plasma Physics Laboratory

DATE June 24, 1985

To PPPL Staff

SUBJECT Reduction-in-Force

FROM Harold P. Furth HPF

In my memorandum to the PPPL staff of February 13, I informed you that the Laboratory's FY 1986 budget had been reduced to about $100M -- a cut of 13% below the 1985 budget. In my "State of the Laboratory" presentation of May 1, I discussed with you the impact of the budget cut on the Laboratory's plans, and announced that there would have to be a reduction in PPPL staff from 1293 to 1120. I also announced that the University and DoE had approved a Voluntary Separation Plan for employees aged 60 or above, with ten or more years of service.

Meanwhile DoE budgetary guidance for FY 1986 has held steady, and the response to the Laboratory's Voluntary Separation Plan has been strongly favorable: 68 members of the staff have enrolled. Taking into account the normal processes of personnel turn-over that have taken place already and are expected during the coming year, we are now able to estimate that involuntary separations can be reduced from our initial estimate in the range 5-8% to the 3% level.

In spite of these helpful developments, I regret to report that the scheduled Reduction in Force (RIF), at the 3% level, has to be carried out in order to stay within the Laboratory's budgetary plans. Thirty-six Laboratory employees were notified today that they are being laid off. In addition, about ten non-exempt staff are involved in job reassignments within the Laboratory, following RIF procedures based on length of service. Staff members who have been laid off will receive severance pay based on their length of service, according to the Laboratory policy. The Laboratory has engaged an experienced counselling firm to assist them in finding new employment.

Over the next few months, managers will have to adjust procedures, organizational structures, and some individual assignments to accommodate the scheduled manpower reductions. During 1986, there will necessarily be a slowing of progress in those areas which are affected by the budget cuts. The Laboratory's overall research program continues to be strong, and our prospects for the longer term are favorable.

HPF:dvl

HP Furth

TFTR Pellet Injection

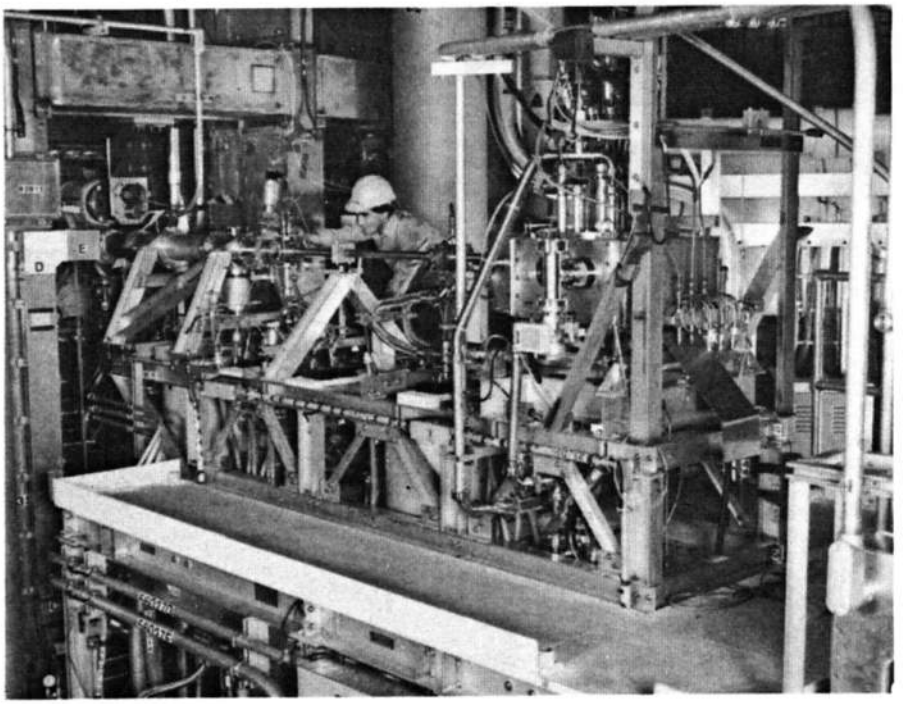
Just as an injection can often cure an illness, TFTR experimentalists are hoping that a new pellet injection system will increase plasma density, thereby increasing the plasma $n\tau$, a measure of progress in plasma confinement. Thus far, the system seems to be meeting their expectations.

By late 1983, several laboratories including PPL obtained good plasma performance by using pellet injection. Alcator-C used pellet injection to obtain the highest value of $n\tau$ ($\sim 8\times10^{13}$ cm^{-3} sec) ever achieved on a tokamak. PPL had been considering injecting tritium pellets into TFTR as a technique for reaching the Q=1 mode of operation in deuterium-tritium, while simultaneously minimizing machine activation. The Alcator result stimulated PPL to begin TFTR pellet injection as soon as was reasonable.

In spring of 1984, PPL began a joint project with Oak Ridge National Laboratory to produce one tritium and two deuterium pellet injectors for TFTR. The total cost for all three injectors is estimated at approximately $10 million, spread over a four-year period.

The device which operated on TFTR, the repeating pneumatic injector (RPI), was constructed at Oak Ridge. It was used for development work there before being upgraded for use on TFTR.

The RPI has a single barrel, and can fire pellets into the plasma at 0.2-second intervals. It differs from the two future TFTR pellet injectors, the DPI (deuterium pellet injector) and the TPI (tritium pellet injector), which each have eight barrels. The DPI and the TPI will be able to fire each of their eight barrels independently.



The repeating pellet injector (RPI) on TFTR

Both the RPI and the DPI can run either hydrogen or deuterium pellets, while the TPI can also use tritium pellets. The DPI is to be installed on TFTR by April 1986, and the TPI will be installed in 1988.

The RPI is controlled from the TFTR Control Room. The pellet formation process begins when gas enters the top of the injection apparatus. The gas travels down a tube that extends through several refrigerators, where it turns from a gas into a liquid and finally becomes a solid maintained at approximately 15° K. The solid is extruded into a "ribbon," from which a cylindrical slice is cut by a moving barrel. The barrel seats itself in the injector breech. High-pressure hydrogen gas is then released behind the pellet, accelerating the pellet down the barrel and injecting it into the tokamak. Following each injection, any waste "ribbon" is is pumped away and the unit is recharged.

The postponement of the TFTR shutdown period worked in the RPI's favor. In fact, the shutdown was postponed partially to allow the unit to be installed and operated before TFTR shutdown. The RPI was shipped from Oak Ridge in mid-February; it fired its first pellet on March 9, and fired into TFTR for the first time March 15.

On that day, according to Technical Systems Division Head Roy Little, the RPI fired four deuterium pellets with diameters of about 4 mm at 1.4 kilometers/sec into an ohmically heated TFTR plasma. Although the shots were not completely diagnosed, ini-

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tial estimates are that pellet injection increased plasma density by a factor of approximately four to five without plasma disruption.

During subsequent experiments, the RPI was modified to fire 3 mm pellets at rates up to one pellet every 0.2 sec. This multiple pellet capability allowed more controlled experiments to be done.

The RPI operated until the TFTR shutdown. Thus far, pellet injection appears to provide an alternate method of increasing plasma density and has the potential to create significantly higher plasma densities. It may become an integral part of TFTR high density operation.

Dr. Little pointed out that everyone connected with the RPI worked extremely hard from late January through early March to make the system operational. "The fact that RPI system installation and performance went so smoothly is a credit to all those who worked on it. Their hard work is why there were so few bugs. The Oak Ridge team was here for several weeks, and we had mechanical engineers, electrical and electronics engineers, Computer Division engineers, and many others all working in parallel on the project."

The Oak Ridge team, which was managed by Boyd Maxon, included chief physicist S. Milora. The pellet injection project was managed by PPL, with J. Sredniawski (GAC) serving as project manager and G. Schmidt acting as chief PPL physicist. Heading the PPL pellet injection effort were George Labik (mechanical engineering), Allen Stevens (electrical systems), M. Oldaker and T. Slaight (electronics), and Jim Snyder (computer systems).

Various improvements are planned for attendant pellet injector diagnostics. For example, experimentalists are presently unable to see the pellet once it leaves the RPI barrel. During the shutdown, a window and camera combination will be installed to allow scientists to view the pellet as it enters the plasma. Software and diagnostics for the entire system will also be improved.

Property Passes

Since PPL receives the majority of its funding from the Department of Energy, all material and equipment purchased or furnished by the laboratory is government-owned property. As part of our contract with DOE, PPL is obligated to provide a control and protection plan for the government property in its possession.

In an effort to monitor its government property, the laboratory instituted a property pass system several years ago. Property passes are required for all equipment, material, or property being transported off laboratory grounds, including tools and scrap.

Any material or equipment being removed from Forrestal Campus in a privately owned vehicle must be accompanied by a property pass that has been signed by an authorized supervisor. Material or equipment transported off-site in government or commercial vehicles must have a service order, job order, or some other documentation showing the reason for transport. Property passes are only issued for the transport and temporary use (up to one year) of equipment and material required to fulfill our contract with DOE.

Property passes are available in the stockroom, and each department has a list of individuals authorized to approve the passes. For any further information, contact Chris Gillars at ext. 2853.

Fat Formula --

Do you have a weight problem? You can figure it out by following this formula from Dr. Richard Freeman, vice chairman of medicine at the University of Wisconsin:

- A man who is five feet tall should weigh 106 pounds. If you're taller, add six pounds for every inch of height. As an example, a man 5'10" tall should weigh 166 pounds.

- A woman who is five feet tall should weigh 105 pounds. If you're taller, add five pounds for every inch of height.

SEER Judges Shine Spotlight on Science

John Bradish, Mary Ann Brown, Ernie Neideschmitt, and Gary Taylor took a look into our energy future recently when they volunteered to be judges for the annual Student Exposition and Energy Resources (SEER) science fair, sponsored by the National Energy Foundation (NEF).

The SEER program provides secondary school students with the opportunity to construct projects demonstrating new energy sources, or new ways to obtain and use energy. The projects, which range from dioramas through mock-ups, are judged on a local and national level. A national grand prize is awarded, and many prize-winning entrants are selected to visit energy-related industries around the world.

Computer Division engineer John Bradish got involved with SEER after an eighth grade science teacher interested his son in competing. He became a judge for the New Jersey NEF chapter SEER program in 1981.

John sees his work with SEER as a natural extension of his work here. "One of the reasons I came to the laboratory was because energy planning for the future was going on here. I was interested in becoming involved with a big project in that forward-looking area, and I believe that's what the SEER program is doing on a smaller scale. I also think it's a great idea to get kids thinking about energy early. Adults often have preconceived notions about energy, where a kid's mind is still pretty open. They're willing to read about something, come up with new ideas, and try to build a project based on those ideas."

SEER judges Mary Ann Brown, Ernie Neideschmitt, Gary Taylor and John Bradish (background, left to right) hosted this year's PPL Corporate Award winners when they visited the lab for a recent tour.

SEER projects are evaluated on their relevance to the theme of energy, their potential practical application, the entrant's verbal explanation of the project, the creative talent the project represents, and the workmanship of the presentation. Judges are drawn from industries that sponsor SEER corporate awards, interested school teachers and scientists, or private citizens with some knowledge of scientific topics.

John adds his own judging criteria to those provided by the NEF. "When I'm looking at a project, I try to go at it from the technical side. Working models have always impressed me, because while the kids are building them, they're also proselytizing their parents to their energy concerns."

"Most of us remember how hard it was to build that simple electric motor for our grade school science class. It wasn't all that easy to make that thing spin! I feel that if a kid can manage to put together a model that actually works, it shows that a lot of thought and a good understanding of the science involved went into it."

But some projects are compounded of a student's passing interest and a parent's concentrated construction abilities. "Deciding whether or not the kids had outside help is really a judgment call," John admitted. "It really shows up when the student has to explain his project, which is a mandatory part of the judging. If the kid understands it and can explain it, it

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validates the assumption that he's done it himself. Only the kids that have done the science can really understand the concepts well enough to explain them."

This is Mary Ann Brown's second year as a judge, although she's been involved in science fairs for 25 years, "either as a spectator or helping one of my sons get the information for his project together." She got interested in the SEER program not only due to her sons' involvement with it, but also because she sees SEER as an important avenue for promoting science education.

"I don't think science is pushed enough in the schools. Students often have a hard time getting support from their teachers in preparing projects for these kinds of science fairs. Teachers need to take the initiative to inform students about these competitions. I think that students are often interested in science, but they need guidance and support from teachers who can serve as mentors. They have to be guided away from making so many science fair volcanoes!"

John agrees. "Although the contest is open to any student state-wide, the amount of entries really depends on how active the SEER program is in various areas of the state. The key to keeping it active is the recruitment of teachers: that's really crucial. If they think it's important, they'll communicate that to their students."

Both Mary Ann and John would like to see more lab employees volunteer to be judges at science fairs like SEER. In fact, both felt the program was important enough to warrant taking a day off to be a judge.

"It only takes one morning of your time," Mary Ann pointed out. "And I enjoyed seeing the students standing there, explaining their fusion-oriented projects -- and using a lot of PPL publications to do it!"

"I've accompanied the SEER winners who've won a tour of the lab," John concluded. "It's great seeing the kids react to this place; they're as impressed as if they'd been to Cape Canaveral! And in a way, helping out with the program is a way of continuing to carry on the lab's work."

To volunteer to work with next year's SEER program, contact the New Jersey chapter of the National Energy Foundation, P.O. Box 384, Convent Station, NJ, 07961, or call 201-522-0403.

TRANSITIONS

The HOTLINE offers its congratulations to the following employees, who recently became proud parents:

Dennis Mueller of TFTR Research and his wife, Linda, whose son, Colby, was born on May 11;

Alan Janos of S-1 and his wife, Patricia, whose daughter, Alicia, was born on June 12;

The HOTLINE would also like to congratulate John Byaesko, Ruth Donald, and George Lennox, who retire from laboratory service on July 1.

United Way AT WORK

How do you deal with stress? It can help to talk to a friend, according to the United Way-Princeton Area Communities.

Research reveals that people who maintain their interpersonal relationships during times of transitional or emotional stress fare much better than those who keep their problems to themselves.

You can also minimize the stress in your life by:

- Identifying the source of stress. Recognizing what people or situations are stressful to you can help you deal with them more effectively.
- Your physical condition can have a strong impact on your emotions. Exercise at least three times a week, get plenty of rest, and eat a well-balanced diet.
- Continued suppression of your feelings only creates a vicious cycle of stress. Laugh or cry -- express your honest emotions.
- Set priorities, and take one thing at a time. Learn to say "no" and mean it.
- Take control of your time and your life. Be sure to schedule time for yourself in your daily routine.

Some of the United Way agencies, such as the Family Service Agency (which has of-

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fices in Princeton and Hightstown), can help individuals troubled by stress. This agency can also refer callers to agencies not affiliated with the United Way. For information, call the Princeton Area Council of Community Services at 609-924-5865 or 799-6033.

Feeling blue from time to time is something else that hits all of us. But when those feelings continue (or intensify) over a three to four week period, you might be slipping into clinical depression. Some warning signs of depression include changes in sleeping or eating patterns, lack of interest in activities, inability to concentrate, or a sense of hopelessness.

If you notice these symptoms in yourself, the United Way urges you to seek professional help before the problem begins to disrupt everyday living. The United Way supports such counseling services; the Princeton Area Council of Community Services can be contacted for information or referral.

Water Hazards

As the summer heats up, many of us cool off by swimming or boating. Too often, the relaxation water sports provide can lead to thoughtlessness -- and tragedy. To preserve family summer fun, follow these safety tips:

- NEVER swim alone. Always use the buddy system, or swim in lifeguard-protected areas.
- Before entering the water, check for hidden obstructions, dropoffs, or strong currents. Don't dive into water depths of four feet or less; that also applies to diving into most above-ground pools.
- Even a few inches of water can be enough to drown a small child. Always provide supervision for youngsters playing near any pool or body of water. Empty portable or wading pools after use, at night, or after rainfall.
- At least half the annual boating accidents and fatalities can be attributed to intoxication. Keep aware on the water; don't go overboard on the alcohol!

OSHA Violations

The following safety reminders are drawn from a list of common OSHA (Occupational Safety and Health Administration) violations:

- Portable fire extinguishers shall be maintained in a fully charged condition, and kept in their designated places at all times when they are not being used.
- Extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of fire. They shall be located along normal paths of travel, and where the maximum travel distances between the extinguisher and its potential use area are minimized.
- Extinguishers shall be inspected monthly (or at more frequent intervals when circumstances require) to ensure that they are in their designated places; have not been activated, tampered with, or damaged; and to detect any obvious corrosion, or other impairments.
- At intervals not exceeding five years, carbon dioxide and stored-pressure water fire extinguishers shall be hydrostatically tested. The first test may be conducted between the fifth and sixth years.

Grilling Safeguards

Dining "al fresco" can be a refreshing way to beat the summer heat. To keep the heat from blazing into a backyard fire, put these safety rules on the menu at your next cookout:

- Keep charcoal grills on level ground in an open area. Never use charcoal indoors.
- Barefoot barbecuers are liable to wind up with a hotfoot. The chef should be wearing proper foot protection, along with a long apron and potholder-type gloves.
- Don't use kerosene, gasoline, or lighter fluid to start a fire. Wood shavings, a UL listed electric starter, or special liquid or solid fire starters are safest.
- Beware of flying embers on windy days. Keep water or a fire extinguisher handy, and use long-handled grill tools.
- Keep cold foods in the refrigerator until ready to serve. Cool leftovers immediately after serving to prevent spoilage.

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