



HOTLINE

PRINCETON PLASMA PHYSICS LABORATORY

Vol. 4, No. 7

November 11, 1982

The final major TFTR component was successfully installed on the machine October 26, when the umbrella structure was lowered onto its supporting columns.

The 104-ton assembly is comprised of a stainless steel umbrella structure, supporting five poloidal field (PF) coils. The entire unit has a diameter of approximately 45 feet.

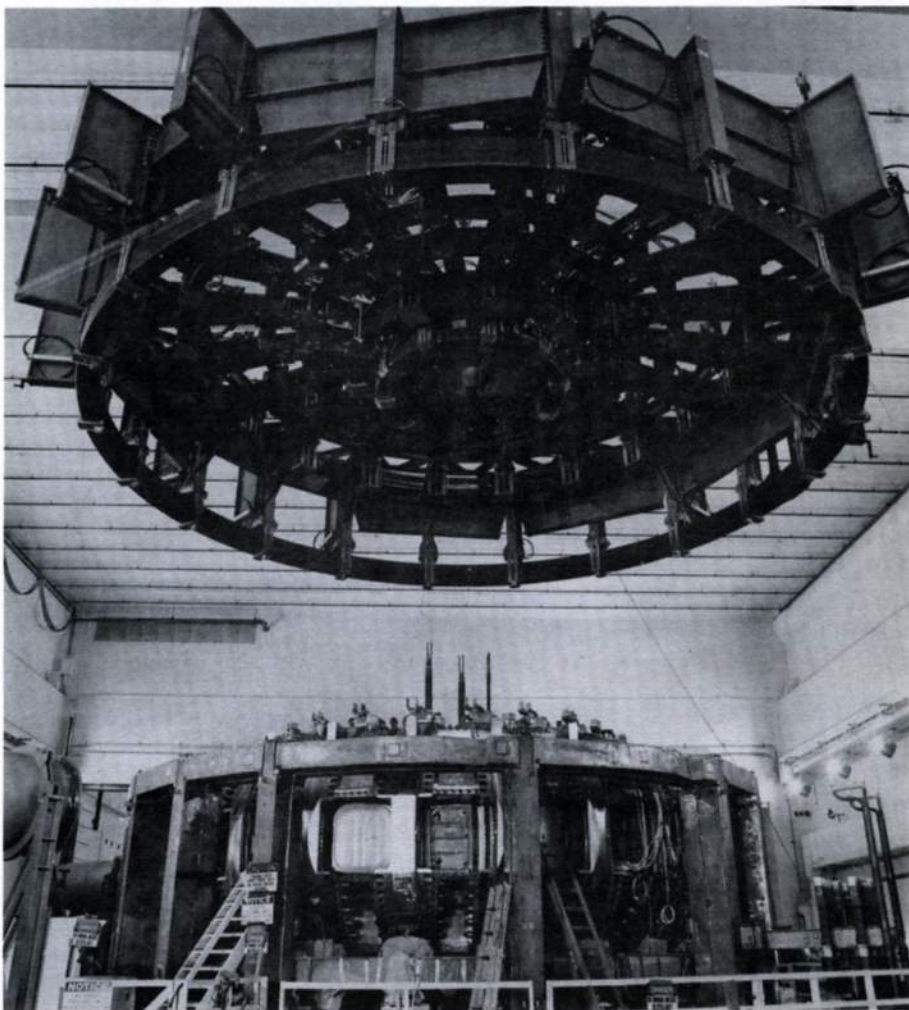
Although the lift itself began at 12:30 p.m., several hours had already been invested in preparation for it. Preliminary rigging had to be adjusted to assure a level lift of the massive assembly. By the time the test cell crane began lifting its burden, the load had been balanced to within one-quarter inch on all sides.

Once the lift started, events moved quickly. The assembly was located atop TFTR, maneuvered to within one inch of its final location, within 15 minutes. The final settling of the assembly onto its supports took several hours, however, due to the care taken to resolve potential interference problems.

"This was a very, very important lift," said TFTR Program Head Dr. Don Grove. "This is the last major component. Now people will begin thinking of TFTR as nearly a working machine."

Final connections between the upper and lower portions of the machine remain to be finished, along with connecting buswork at the top of TFTR. Dr. Grove estimated completion of this work by the end of November, which would still allow TFTR to achieve first plasma before the end of the year.

UMBRELLA ASSEMBLY LIFT



Umbrella assembly being lowered onto TFTR (above).

FIRST VACUUM ACHIEVED

On November 3, the large toroidal vacuum chamber of TFTR was pumped down using only three of eight turbomolecular pumps. The pressure reached 2×10^{-5} torr despite the presence of several small and easily fixed leaks at small cover ports. TFTR Program Head Don Grove said that "considering the large volume ($7 \times 10^7 \text{ cm}^3$) and the large surface area ($2.5 \times 10^6 \text{ cm}^2$), this is a very respectable pressure for a first pumpdown. This result is a very important milestone on the way to a first plasma by year end."



Pete Haney (standing) and John Opperman guide another TFTR rectifier component into place. Seven rectifiers were recently run in series, with power provided by the TFTR MG set.

RECTIFIERS TESTED

Another milestone on the road toward first TFTR plasma was passed October 21, when four rectifiers powered by the TFTR motor generator set were successfully pulsed simultaneously.

With the MG set running at approximately 330 RPM, four toroidal field (TF) rectifiers were pulsed in series into two PLT TF coils. Pulse levels of five kilovolts at 21 kiloamps, producing over 200 megajoules of energy, were attained.

The successful test was also a milestone in another way. In order to run TFTR coil windings successfully, a smooth direct current pulse of 24 conductions per cycle is necessary. The TF rectifiers were combined to operate at 24 conductions per cycle, the first time that mode has ever been successfully operated at PPL.

Energy system test engineers have reported that four TF, two equilibrium field (EF) and one variable curvature (VC) power supplies have been run during the rectifier testing program.

First plasma for TFTR will require these seven rectifiers operating simultaneously.

The October 21 test was part of the coordinated system testing for rectifier and MG acceptance.

CONSERVATION CONGRATULATIONS

During the past fiscal year, PPL implemented a very stringent energy conservation program. Its goal was to reduce the FY82 electric bill from an estimated \$4.7M to under \$3.0M. As the result of the efforts of many people, this goal was met — our final bill was \$2,968,080.

Our thanks are extended to everyone who supported the program. While the HOTLINE cannot acknowledge every person who helped, we do want to note the following:

- members of the Energy Management Committee, working with Frank Fumia and Dave O'Neill.
- members of the Electric Power Subcommittee, working with Bob Gulay.

- members of the Employee Awareness and Energy Monitoring Committees, working with Ray Pressburger and Steve Ragolia.
- Henry Chandler and the entire MG Control Room staff.
- Connie Stout and the PM&E staff.
- Jim Koplner and the Security officers.

With the operation of TFTR and other experimental devices, the opportunities for energy savings are far greater this year than they have been in the past. The laboratory will extend last year's successful conservation program into FY83. Everyone's continued cooperation will be appreciated.

HEATING POLICY

In an effort to combat increasing energy costs and deal with budgetary restrictions, PPL is continuing the winter heating policy it has followed for the past several years. The policy has resulted in significant savings through conservation efforts by the laboratory community.

The policy requires thermostats to be set to maintain temperatures of 65 degrees Fahrenheit. Heat will also be turned off or cut back on weekends, weather permitting. Exceptions will be made for designated experimental areas, but unannounced inspections will be held throughout the heating season to insure compliance with temperature restrictions.

Space heaters, which can only be purchased with the approval of Plant Engineering, or individual room controls should be set to maintain the 65 degree level. Unneeded lights should be turned off.

If you have an office or space you feel requires supplemental heat, call Plant Engineering, ext. 3377. If you know of any energy wasting situations, call Plant Maintenance at ext. 3092.

BULLETIN BOARDS

A great deal of concern has been expressed about the ineffective flow of communications on the laboratory's bulletin boards. Part of this problem is the result of unauthorized individuals adding to or removing information from these boards.

The current bulletin board distribution list is printed below. If your name has been omitted, or if your name is listed and it should not be, please notify Meg Gilbert at ext. 2036.

Edna Willis - 1K
Deborah Carter - Mod 2
Virginia Arnesen - Aero Lab
Joseph Hengeli - 1F
Barbara Baker - 1N
Pat Pugliesi - Matterhorn
Dottie Pulyer - 1P
Trudie Greiner - 1E
George Beauregard - 1K
Pat Melsky - LOB E. 2nd Fl.
Letty Wohar - Guggenheim
Ann O'Day - Plant Engineering
Sharon Berson Sayre Hall
Mary Alice Eubank - C-Site
Athene Kan - Rec 3
Ben Velivis - MG Room
Kim Prutky - Experimental
Bob Majeski - Coil Shop
Meryl Finkelstein - C-Site B240
Verna Weyman - Chem Science
Roseanne Wurst - Data Aquisition
Joyce Bitzer - 1E
Muriel Strohl LOB East
Joe Malinowski - 1K
Jean Hurley - 10
Betty Klank - Maintenance
Lilly Olsen - Theory
Jo Ann Frazer - 1R
Joyce Lawton - 1A West
Helen Glover - Rec 4
John Pacuta Maint., Boiler Rm.
Clem Gardner - RF Balcony
Helen Livernoche - 1E
Ann McKee - 10
Pat Zeedyk - Motor Pool
B. Reavis - Hangar
Marie Maruso LOB 2nd floor
Carol Gill - 1P
Gloria Pokrywka - C-Site

NEW MANAGER

Richard Rioux has been selected as the new C-Site chef/cafeteria manager by Interstate United, the cafeteria food vendor. Dick, who managed the American Cyanamid cafeteria for three years, replaces Earl Thomas.

In addition to a new manager, the cafeteria also has new breakfast hours. Pancakes, French toast, eggs, meats and hot and cold cereals will now be served from 7 to 8:45 a.m.

A cafeteria preference survey designed by Administrative Services Manager Ruth Donald is printed below.

SOSS SEMINAR

Payroll Supervisor Jim Stefane will be the guest speaker at the next Secretarial and Office Support Staff (SOSS) seminar, scheduled for November 15 from 11 a.m. to noon in the Sayre Hall auditorium.

ADMINISTRATIVE SERVICES

CAFETERIA SERVICE SURVEY

Please complete and return to ADMINISTRATIVE SERVICES, MODULE II, C SITE by November 15.

1. I use the ___ B ___ C Site Cafeteria -

___ Regularly ___ Occasionally ___ Rarely ___ Never

If never, why don't you use the service?

___ Too Expensive ___ Food Selection too limited

___ Takes too long ___ Inconvenient Time Schedule

Other: _____

2. Do you have suggestions for food items not presently available?

Breakfast: _____

Lunch: _____

3. At "C" Site, do you prefer the coffee cart or would you prefer to have morning coffee in the cafeteria? _____

If you are a supervisor, would you object to your staff going to the cafeteria for a.m. coffee break? _____

4. Do you have any MAJOR complaints about the present service/food?

___ No If yes, please note: _____

5. What service improvements do you suggest? Please indicate which Site — "B" or "C". _____

6. Do you have suggestions for improving the vending machine service? _____

7. Other comments: _____

RWD
11/1/82

BIKER TOURING FUSION FACILITIES



Mike Chase during his PPL stopover. His next destination was the Oak Ridge National Laboratory in Tennessee.

Michael Chase is chasing down a dream he's had since his teens: to visit all the fusion energy research laboratories in the United States. That may not be novel, but his way of pursuing his goal is -- he's riding his bike across America.

Michael, 40, was an instructor at Michigan Technological University from 1973 through 1980. He got his electrical engineering and data systems training in the Navy, and was using that knowledge in a simulation lab as a resident electrical engineer. "Any physics or technical problems that came up were usually sent to my lab for computer modeling of the situation," he reported. Mike had also worked on the Stanford Linear Accelerator from 1968 to 1973, where he did basic research in high-energy physics.

But after an 18-month stint in industry as a "computer bug-chaser", Mike decided to make his youthful idea a reality. "From the early '50's," he recalled,

"fusion was an interest of mine, as a potential unlimited energy source. I'd been following the fusion program for 25 years, but this would be the first time I physically went to the laboratories. So I decided to stop traveling vicariously, to get into the saddle at age 40!"

Chase chose a bicycle for his trek; "it may be sacrilege for someone from Michigan to say, but I never liked automobiles. I had a bike that I never used, except to go on short trips of no more than seven or eight miles."

How, then did he condition himself for this endurance test? "There's a 1,200 foot hill on the peninsula I live on in Michigan," he explained. "It is a 125 mile round trip to the end of the peninsula and back, and I made sure I rode up and down that hill daily. During my daily rides, I checked out all the little back roads I'd seen, but never had the time to travel down."

Mike began his nationwide journey July 17. He started from Houghton, Michigan, camping at night or staying in motels in bad weather. By the time he reached PPL on October 15, he had clocked over 1,800 miles and had visited the Massachusetts Institute of Technology. MIT is the home of the Alcator-C fusion device.

Mike plans neither his visits to laboratories nor his days on the road, and his MIT stop was no exception. "I rode onto the campus," he remembered, "and saw two students leaving a building. I told them what I wanted, and they directed me. In fact, I wound up camping in the backyard of one of their homes!"

Mike was impressed with Princeton's fusion efforts, maintaining that "Princeton's the heart of the magnetic confinement program. I got a good feeling about the program after meeting and talking with the people here. If there's going to be a breakthrough, it's going to be made right here. It's been a real pleasure to visit!"

He contends that this nation should consider itself in "a war for energy. If breakthroughs will show the practicality of fusion energy, we should damn the torpedoes and go full steam ahead with one!"

As a teacher, Chase would like to see fusion integrated into school curricula. "Fusion isn't stressed in our physics programs," he believes. "We should take steps to integrate it into the engineering courses as well. Sparking and nurturing interest in fusion, for students who will be our future physicists, should be a national goal in our war on energy dependence. If I could influence just one young mind to come in this direction, that would be a very satisfying achievement!"

After visiting with friends in Philadelphia, Mike's next stop is scheduled to be the Oak Ridge National Laboratory in Tennessee. His itinerary will eventually lead him to both the Lawrence Berkeley and the Lawrence Livermore Laboratories in California.

REVISED APPLICATION FOR MAJOR MEDICAL BENEFITS

A new form for filing Major Medical claims has been established by TIAA. The changes outlined below are a result of legislation passed by several states:

- A Notice of Fraud is added. This notice (signed by you as the claimant) advises you that should you intentionally falsify or conceal information regarding an application for benefits, you are committing a fraudulent insurance act — which is a crime.
- An authorization to obtain medical information is included. This authorization, signed by you, will be used by TIAA to determine eligibility for benefits.
- The physician's statement, also included in the previous form, has been revised.

All of these changes will probably occur nationwide in the near future.

In addition to the revisions, TIAA has eliminated the use of separate forms for initial and supplementary claims. From now on, one form will be used for both; when filing a supplementary claim, just include your claim number in the space provided.

To obtain the new forms, please call Eleanor Schmitt, ext. 2046.

A reminder to C-Site employees: Eleanor is at C-Site every Tuesday morning in the LOB, Room 345.

BENEFITS NEWS

MAJOR MEDICAL ID CARDS

Identification cards for Major Medical benefits are now available at Eleanor Schmitt's office, 219 Sayre Hall or you can call her at ext. 2046.

WORKERS' COMPENSATION

Effective November 1, please refer all information or questions on "old" and "new" Workers' Compensation claims to Mary Bersch, 209 Sayre Hall, ext. 2043.

SINGLES SOCIAL

The next Princeton University League singles wine and cheese social is set for November 11 at 5 p.m. in the Fine Tower faculty room on main campus. All single members of the University faculty and staff are invited to attend.

FOR SALE

White & gold French Provincial dresser with mirror and chest of drawers. Ideal for young girl - \$100.00.

Solid Cherry Traditional dining room set. Like new. Consists of oval table with 2 leaves, 2 arm chairs, 4 side chairs and a hutch with glass doors - \$2200.00

Call Mary, ext. 2043 or at 259-3549 after 7 p.m.

The PPL Hotline is issued by the Princeton Plasma Physics Laboratory, a research facility supported by the Department of Energy. Correspondence should be directed to PPL Information Services, Module 2, C-Site, James Forrestal Campus, ext. 2754.

VOLUNTEERS:

PEOPLE PEOPLE

The following listing of volunteering opportunities was supplied by the Voluntary Action Center (VAC) of Middlesex County. For further information, contact the center at (201) 249-8910.

- Do you have performing talents? Eager, appreciative audiences await at hospitals, nursing homes, nutrition sites and senior citizen centers. The times are varied, and include many lunchtime requests.
- Do you believe people deserve a second chance? Prison support groups are seeking volunteers to counsel prisoners in finding homes and jobs, provide tutoring in the 'basics' for Graduate Equivalency Diplomas, and help prepare inmates for parenting. This kind of aid can enable prisoners to make a fresh start.
- Do you have a good head for numbers? Several worthwhile agencies need volunteers to help with the complexities of bookkeeping.
- Like fun? So do handicapped kids. Volunteers are being sought to help with recreation programs designed for their special needs.
- Have a way with kids? You're just the person to help youngsters overcome their fear of water. Swimming ability is less important than understanding and kindness.

Two-thirds of the VAC volunteers have full-time jobs. A wide variety of volunteer opportunities are available to those who can spare time during normal working hours.

TFTR SHIRTS

Shirts featuring a four-color TFTR logo, designed by Don Weissenburger and Matt Edgar, are now available in a variety of styles. The logo incorporates a sunburst being powered by four neutral-beam-breathing dragons, and the words "Ignited by 35 megawatts of neutral firepower."

All shirts are 50 percent cotton and 50 percent polyester and are available in soccer jersey, crew neck or hooded sweatshirt, or two baseball tee-shirt styles. Most shirts have a white body, but may be ordered in a variety of striping or sleeve color combinations.



Shirts are available in mens' sizes small (34-36), medium (38-40), large (42-44) and extra large (46), as well as in boys' sizes medium (10-12) and large (14-16). Prices range from six dollars to \$14.50, depending on the style of shirt ordered. The price covers the cost of producing the shirts; any profit realized from the sale will be donated to the United Way.

Order blanks for the shirts are available from the C-Site Reception desk in the LOB lobby, or from the TFTR Word Processing Center, Building 1-P, A-Site. Order blanks have also been posted on bulletin boards throughout the laboratory.

For further information about the shirts, contact Don Weissenburger, Building 1-P, ext. 2599.

TENNIS RESULTS

In a true battle of champions, Jim Bialek defeated Hiro Takahashi in the finals of the sixth annual PPL tennis tournament October 23. Jim, who bested Hiro 7-5, 7-6, has been tournament champion twice in the past. Hiro captured the victor's crown three times in previous competitions.

In other tournament results, Dan Kungl

won the consolation round, with Lane Roquemore and Myron Norris also gaining the semi-finals. The first two rounds of the tournament were played Sept. 11, and were accompanied by a kick-off picnic.

A total of 27 employees and members of their families competed in this year's tournament. The next PPL tennis event will be the team tennis tournament, to be held next spring.



The top finishers in the PPL tennis tournament pose with event organizer Marilee Thompson. Pictured left to right are Marilee, tourney winner Jim Bialek, runner-up Hiro Takahashi, and consolation winner Dan Kungl.

WOOD STOVE SAFETY

As the heating season arrives each year, several families' homes are invariably destroyed by wood stove or chimney fires. Often these fires could have been prevented had the homeowner taken a few moments to perform a pre-sue check on his stove and flue.

Before and after each heating season, the chimney should be cleaned and checked for crumbling brick, loose mortar, obstructions, or creosote buildup. Creosote, an oily, flammable residue which coats chimney walls no matter what kind of wood is burned, accumulates faster when green wood is used. Therefore only dry, well-seasoned hardwoods such as maple, elm, oak or birch should be burned in a home wood stove. In addition to providing the most efficient burn and the most heat, these woods prevent the creosote buildup that can rapidly occur when softwoods such as pine or spruce are burned.

The safest fuel to use in a wood-burning stove is hardwood that has been seasoned for 12 months, with larger pieces split to promote drying. Trash should never be used as fuel, nor should charcoal be used in an indoor stove.

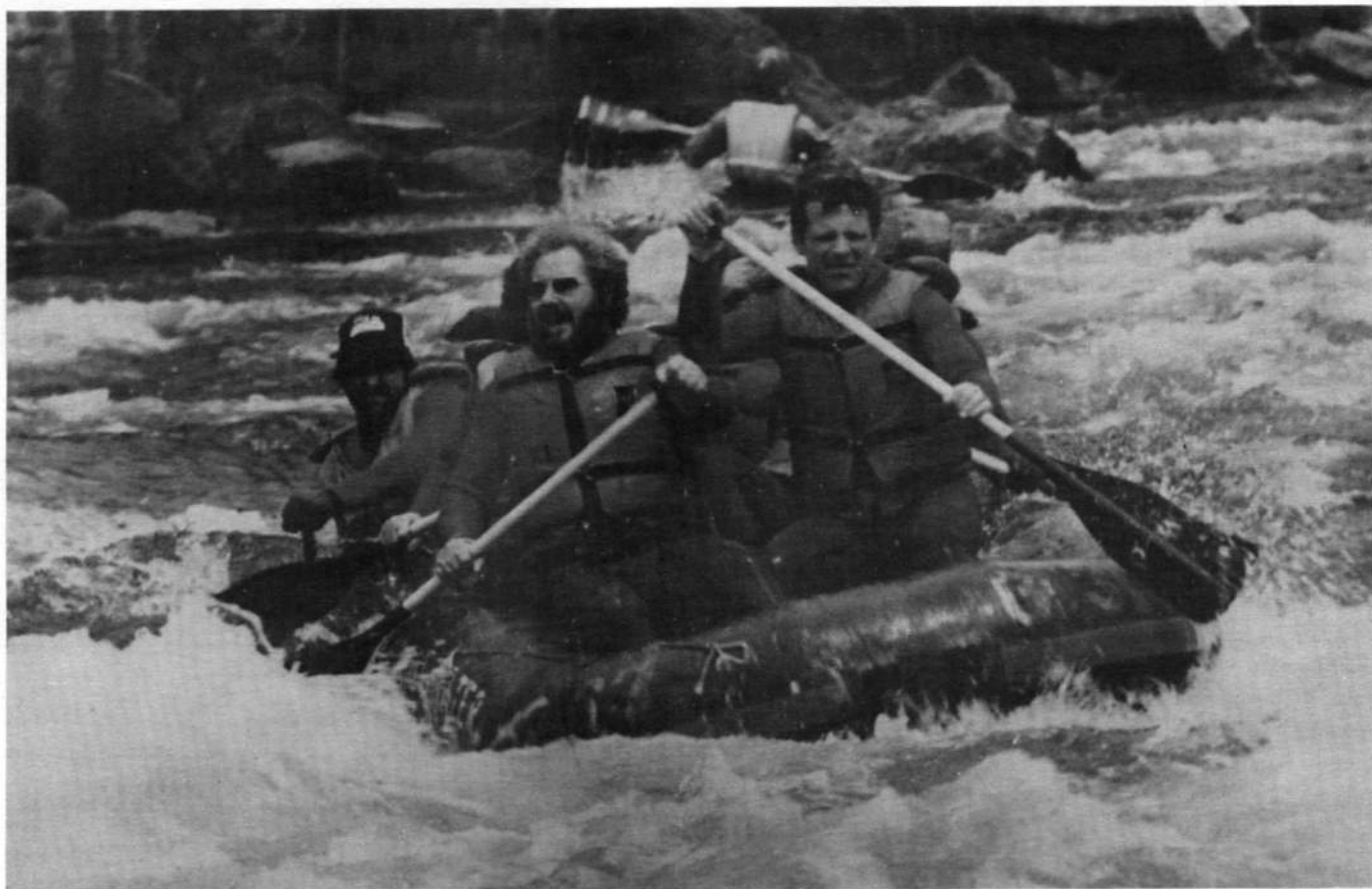
Stopping fire hazards before they start can be as simple as good wood stove housekeeping. Stoves should be kept free of excess ash buildup. Excess ash prevents the circulation of air vital for combustion, so manufacturer's instructions on stove maintenance should be heeded.

When disposing of ashes, never place the ash container on a combustible floor. Move hot or even warm ashes to an outside location to cool, keeping them well away from the house or other combustible materials.

And don't dump ashes into other containers until coals are completely extinguished. Many fires have been started when supposedly "cold" ashes rekindled.

ppl people

RAFTERS REVEL ON RAPID RIVERS



Ever since the days of Huck Finn, "boys" of all ages have been pitting small rafts against rivers churned to rushing whitewater by submerged rocks. Four such rivermen work in PPL's Plant Maintenance department, and have jointly met the challenge of several Northeastern rivers.

Buzz Bauer was the first member of the quartet to get interested in whitewater rafting. After hearing about his exploits, co-workers John Sadovy, Walt Weyman and Ed Gilseman decided to join him on a rafting expedition.

"We wanted a little adventure," Walt

recalled. "We worked together, and we wanted to have a little fun together."

They originally began with short trips on the Lehigh River in Pennsylvania, 'tuning up' for the stronger rivers in West Virginia. That state is generally regarded as the hub of east coast whitewater rafting circles. They first challenged the New River there in 1978.

Although whitewater rafting may look dangerous, all four men feel most of the threat can be eliminated by taking proper precautions. Rafters wear wetsuits to protect against chill water, and life-jackets to keep them afloat if they're

tossed overboard -- an experience that occurs somewhat more often than they would like. In some rivers, in fact, a 'hardhat' cap is required. Each trip participant is also required to sign a release form prior to starting a trek.

Rivers are usually run in the early spring, when they are swollen with winter runoff water. Rafting can be continued in the fall, even after a dry summer, on rivers situated near dams. A rafting group makes a reservation to use the river at a specific time, and water is released from the dam in advance to raise the river to rafting height.

All four men commended the guides they're had on their river treks. "About 15 to 20 rafts go down the river at once," Buzz explained, "and there's a guide in each one. He'll explain a lot about the river, its history and what each rafter can expect. If you're coming up to a particularly difficult area of whitewater, for example, the guide will pull the raft over and describe exactly what you need to do to get through it."

The major instruction is in getting everyone on one side of the raft to paddle at the same time -- a "must" to steer a path through often treacherous currents. Rafterers are also taught to point their feet downriver if they fall from the raft, allowing their legs to act as bumpers, keeping their bodies away from bruising rocks. In addition, kayakers follow the rafts as rescue craft, ready to grab a spilled rafter before he's in any danger.

Ed pointed out that at any time along the way, rafters have the option of getting out of the raft and portaging around a dangerous set of rapids. He sees no advantage in that, however. "You're there to push yourself to the limit," he contends, "to play the game 100 percent. You can't do that if you give up."

Placement when riding a raft is everything, all four agreed. It's important to place the raft on a 'line' when going downriver, an invisible course that allows for the fastest, smoothest ride through the rapids. Rafterers depend on their guides -- or their own experience -- and their paddling skills to keep on track. "If everyone doesn't work as a team," Buzz cautioned, "you can easily lose the line, and possibly tip everyone out of the raft."



Posing in their wetsuits after a day on the river are (left to right) Buzz Bauer, Walt Weyman, Ed Gilseman, Paul Brown and John Sadovy.

Placement is also important when finding a seat on the raft itself. "If you're in the back," Buzz explained, "it can get hairy, because you can get flipped out backwards. The front of the raft usually winds up airborne over some of the rocks, and it's always the first to hit the rapids; it's definitely fun being up there."

Whitewater rafting isn't solely six hours of rapids, however; there are periods when the raft floats calmly through a scenic gorge. Even then the rafters must do more than admire the view; "That's the time you bail the raft out!" Buzz laughed.

John contends that "each course is challenging. Each river looks beautiful, and the ride is usually thrilling. Even when you've gone down a river before, there's always something new there when you come back. Even on a nice day, the risk is still there. The water level can change, for example, and make the run completely different. No river is static; it's constantly changing."

After rafting in Pennsylvania and West Virginia, the four expect to raft on the Kennebec and Penobscot Rivers in Maine this spring.