



HOTLINE

PRINCETON PLASMA PHYSICS LABORATORY

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April 17, 1980

PDX Update

During the last week in March, PDX resumed operation after a four-week shut-down for repairs, more power tests, and magnetic measurements. Since early this year, PDX had been operating using its sophisticated magnetic limiter/divertors as a means of reducing wall-evolved impurity atoms in the plasma. Use of this system resulted in a decrease in carbon and oxygen impurities by about one-half at low densities (about 10^{13} cm^{-3}) where divertor operation was not expected to be very successful. It had been thought that about three times that density would be needed for good divertor results. Titanium impurities in the plasma were reduced by a factor of ten, although some additional titanium influx has been observed late in the discharge.

By shifting the position of the plasma, PDX can be operated using only the inner two divertors, the outer two, or all four at once. The plasma should be least stable in the first two cases. During the first quarter of this year, all of these plasma configurations were tried and were found to be more stable than expected.

The first PDX neutral beam line was installed on the machine in February and was successfully operated first with an ion source from PLT and then with a prototype source. Operation into the machine is expected by the end of the month.

In another new development, a pellet fuel injector has been added to PDX and is expected to be operational soon. Up until now, both PLT and PDX have used gas injection as a means of introducing fuel into the vacuum vessel during operation. On PDX, however, much of the gas, when introduced into the outer scrape-off region of the plasma, is swept onto the neutralizer plates. Only about 10% of the gas fuel penetrates into the central plasma region. With a pellet injector, which was developed at Oak Ridge National Laboratory and successfully tested on the ISX tokamak, a frozen hydrogen fuel pellet is injected into the plasma at a speed of about 1,000 meters per second. The hydrogen

pellet is expected to penetrate the scrape-off region and enter the plasma's center area, enabling achievement of higher plasma densities. It is hoped that in the future a four-barrel unit can be developed to inject pellets at various intervals.

In the next few months, in addition to optimizing divertor action, PDX operation will concentrate on elongating the D-shaped plasma configuration, which showed more resistance to ballooning mode and tearing mode instabilities than is found in more circular plasmas. When the D configuration is elongated, however, the plasma becomes increasingly unstable in the vertical direction. To counteract this, a power amplifier will be added to the PDX divertor field coils to generate a radial field that can hold the plasma on the midplane. With this radial field available, it should also be possible to operate using only one divertor, a desirable situation from the point of view of future reactor design.

More also remains to be done to optimize the magnetic field configuration for plasma start-up with the limiter/divertor system in operation.

Energy Conservation Status

General Facilities Manager, Robert Smart issued the following statement on the laboratory's energy conservation program:

"Thanks to the help of a lot of people, PPL was able to meet its mandated energy reduction goals for March. Unexpected down time on the machines during the last few days pushed us from barely making the mandated 5% reduction to over a 7% reduction.

"Although this is supposed to be the end of the one-year 5% program, we still have a longer term requirement to reduce energy consumption per square foot by 50%."

Mr. Smart added that personnel would be advised of the laboratory's efforts toward that goal, and expressed his thanks for employee support of the conservation measures.



The first class in the technical typing mini-course smiles for the camera. Seated left to right are Dolores Bergmann and Ann O'Day. Standing, left to right, are Joyce Bitzer, Patty Pugliesi, Glenda Fendrick, teacher Elsie Ferreras, course organizers Bobbie Cruser and Millie Willerton of the Secretarial and Office Support Staff Committee, teacher Marianne Weissenburger, and Marilyn Hondorp.

Technical Typing Course Commences

Through the concerted efforts of Millie Willerton and Bobbie Cruser of the Secretarial and Office Support Staff Committee and Larry Holpp of the Personnel Training Office, the technical typing mini-course has become a reality.

The course is designed to familiarize typists with the Greek letters and symbols used at the laboratory, and to aid in preparation of technical papers. The only prerequisite for the course is a typing speed of at least 50 words per minute.

Elsie Ferreras and Marianne Weissenburger are the volunteer teachers for the first session of the course currently underway. Classes, consisting of 6 students and one teacher, meet for one hour on Mondays and Wednesdays or on Tuesdays and

Thursdays. Each session runs for three weeks, with additional classes scheduled at three week intervals.

A total of 32 people have signed up for the course. If you are interested in signing up for subsequent classes, please contact Millie Willerton (ext. 3161) or Bobbie Cruser (ext. 2489).

PPL Annual Report

The PPL Annual Report for fiscal year 1978 is available from Publications and Reports. Anyone interested in obtaining a copy who has not yet received or ordered one should contact Sara Paterson (ext. 2662).

Plan Ahead For Parking

The number of Visitor Parking spaces have been kept down to the minimum needed to handle our normal requirements. However, these spaces cannot handle large influxes of visitors for special conferences and meetings.

To preclude problems with these special functions, persons setting up such programs should notify Security (Jim Kopliner, ext. 7-2-6688) so that additional spaces can be reserved when needed. The additional spaces will normally be an added extension to present visitor stalls.

Please give Security at least three days notice, along with expected automobile count and exact location and duration of the event, when requesting additional spaces.

Toll - Free Directory Saves Time And Money

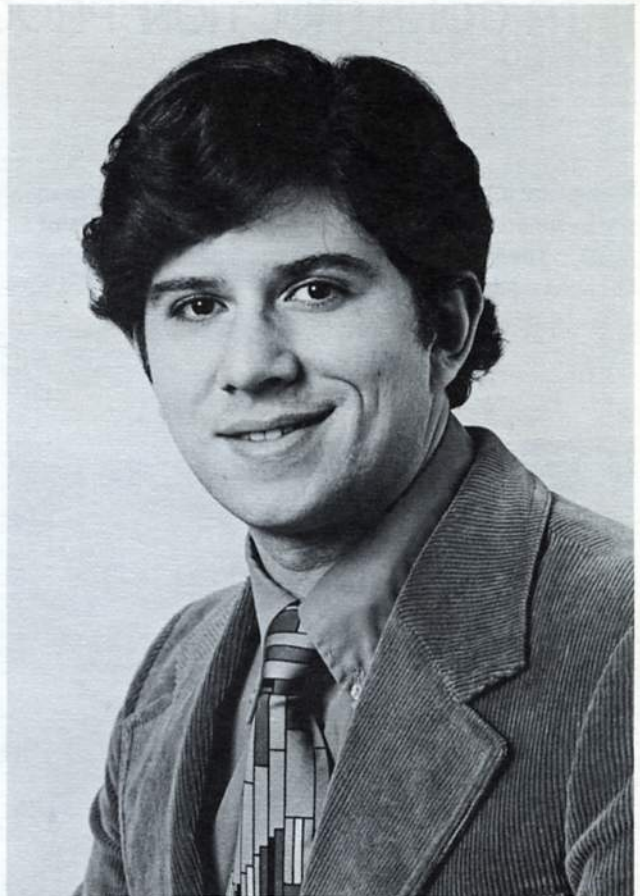
Your fingers can do the walking across the country gratis if you use the toll free (800) telephone directory now available through the PPL Telecommunications Department.

The directory contains hundreds of numbers that may be called with no telephone expense. Listings of places to buy items such as cars, brand name furniture, special cuts of meat, fruit from the grower and flowers are included in the guide. Travel arrangements, hotel and motel reservations, and chartered jet service can also be booked toll free.

The toll free directory is available for inspection in the Console Room, C-Site, Room 108-A.

Symposium Scheduled

The sixth **Fusion Technology Symposium** will be held Monday, April 28 at 4 p.m. in Sayre Hall auditorium. Dr. Don Steiner, manager of the Engineering Test Facility Design Center, will speak on the status and plans of the ETF Design Center.



Larry Holpp joined the Laboratory on February 18, 1980 as Manager of Training and Development. Larry was previously employed as a management development consultant to the Department of the Navy. He has also published several papers on skill development in industrial settings.

Workshops Planned

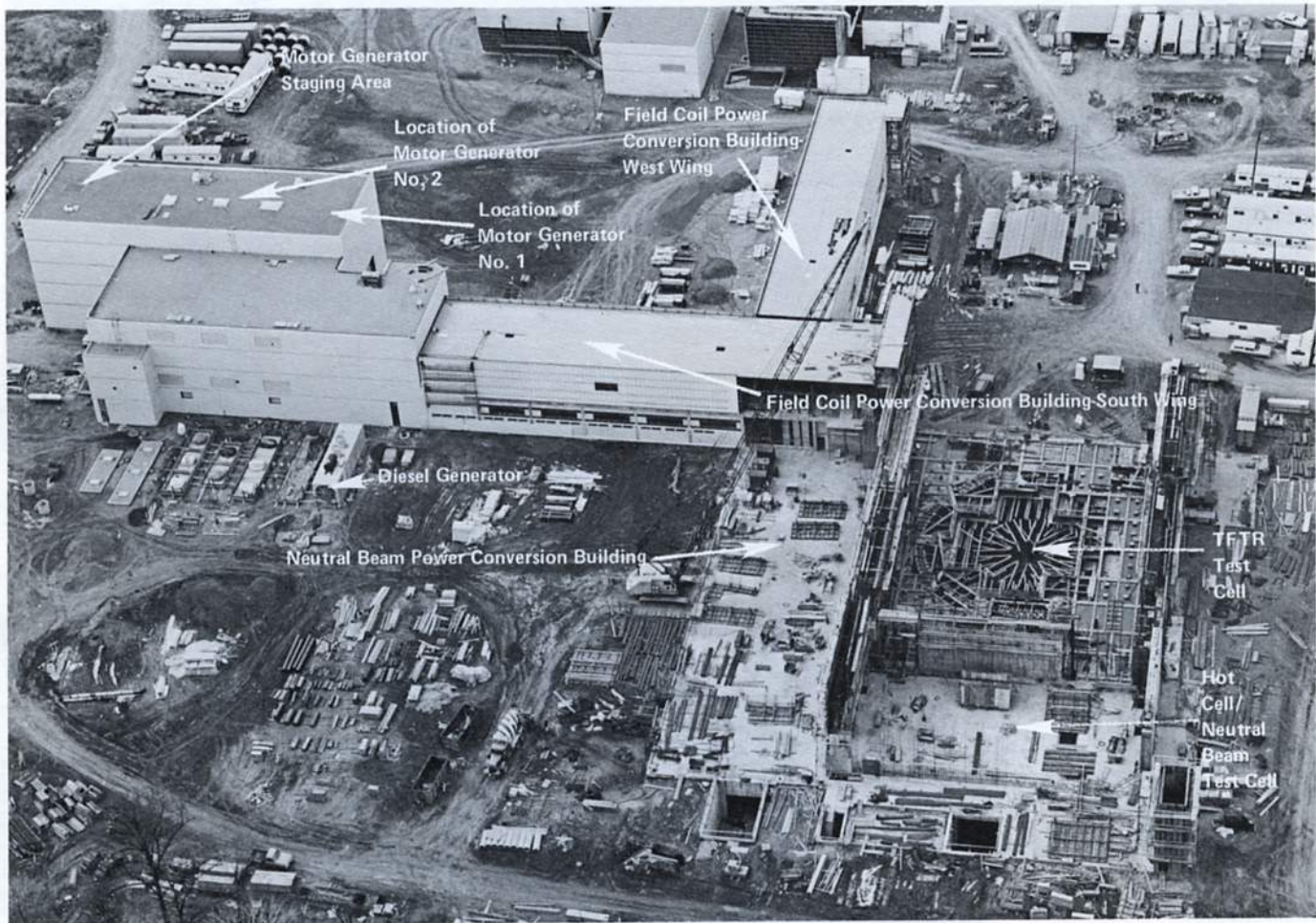
In addition to the new technical typing course, a series of Skill Development Workshops are being planned for the future. Courses will include introduction to computers, word processing, public speaking, enhancing written skills, shorthand refresher and typing for professionals.

Further information on any of the planned workshops is available through Larry Holpp (ext. 3480). A schedule of workshop classes will be announced at a future date.

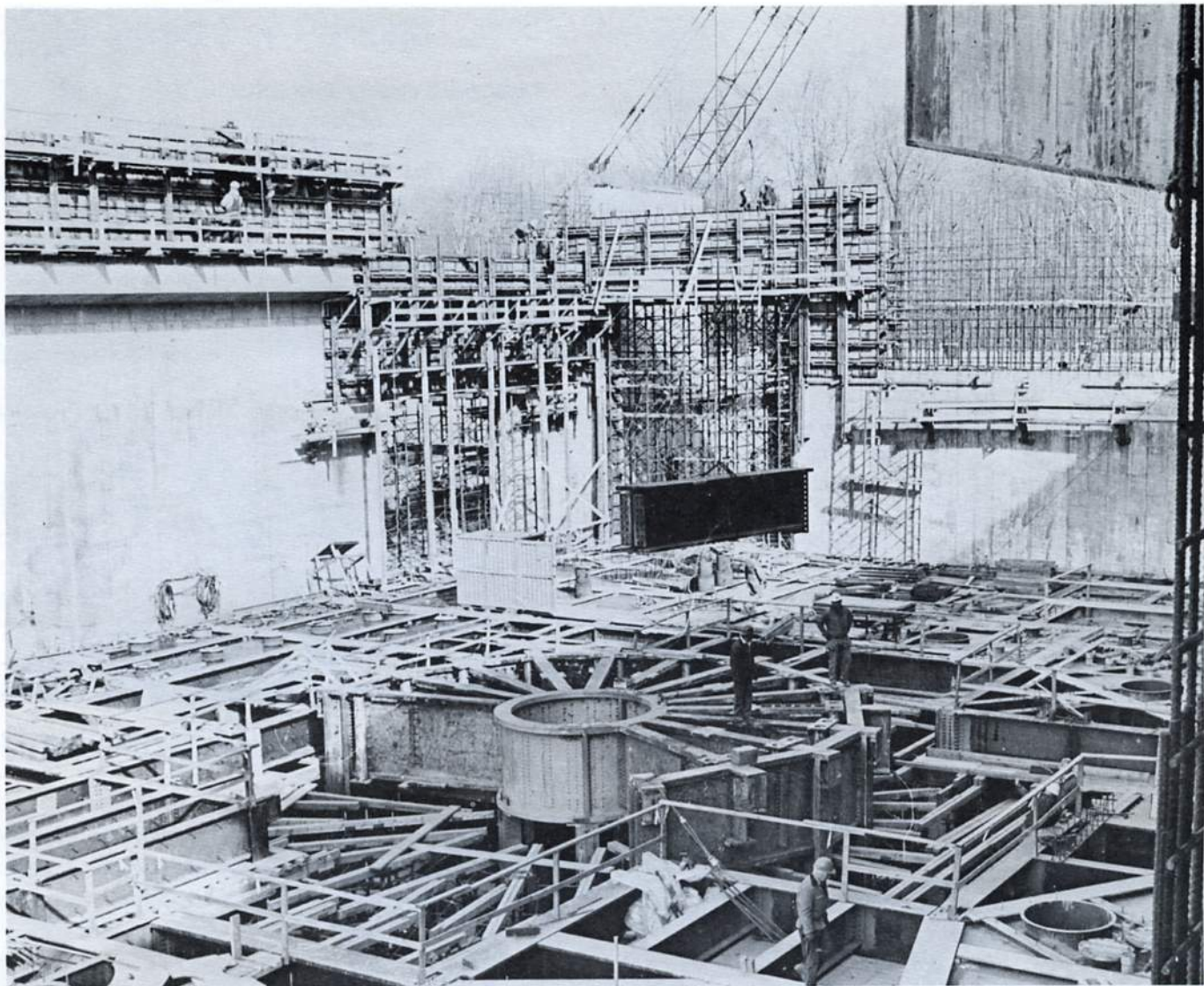
The PPL Hotline is issued by the Princeton University Plasma Physics Laboratory, a research facility supported by the U.S. Department of Energy. Correspondence should be directed to PPL Communications Office, Aero Lab, James Forrestal Campus.

TFTR CONSTRUCTION PROGRESS

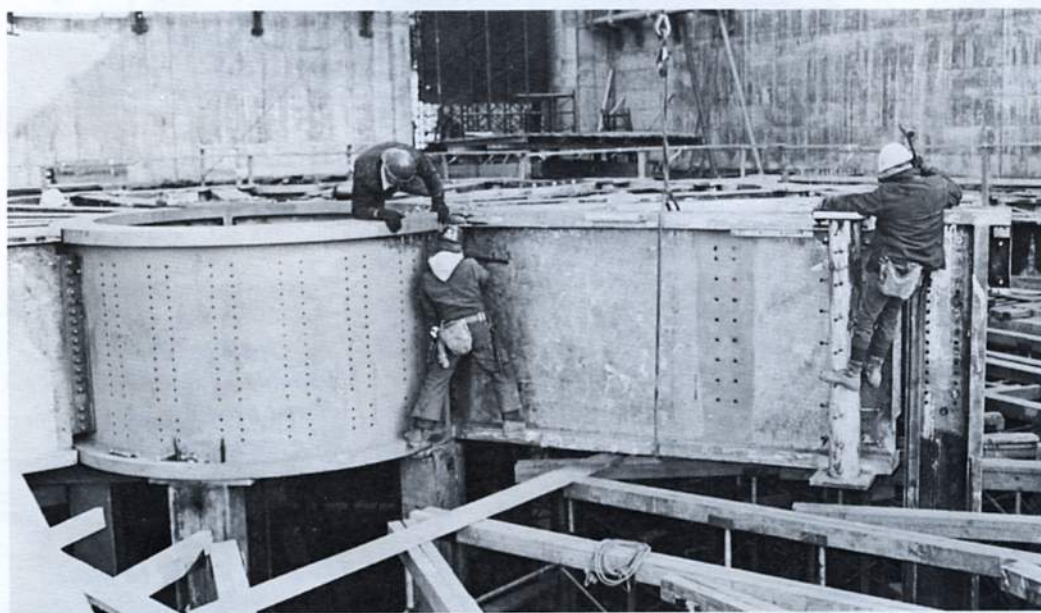
Blessed by a mild winter, TFTR construction has been progressing at a good pace through the first quarter of 1980. These photos show some of the progress that has been made.



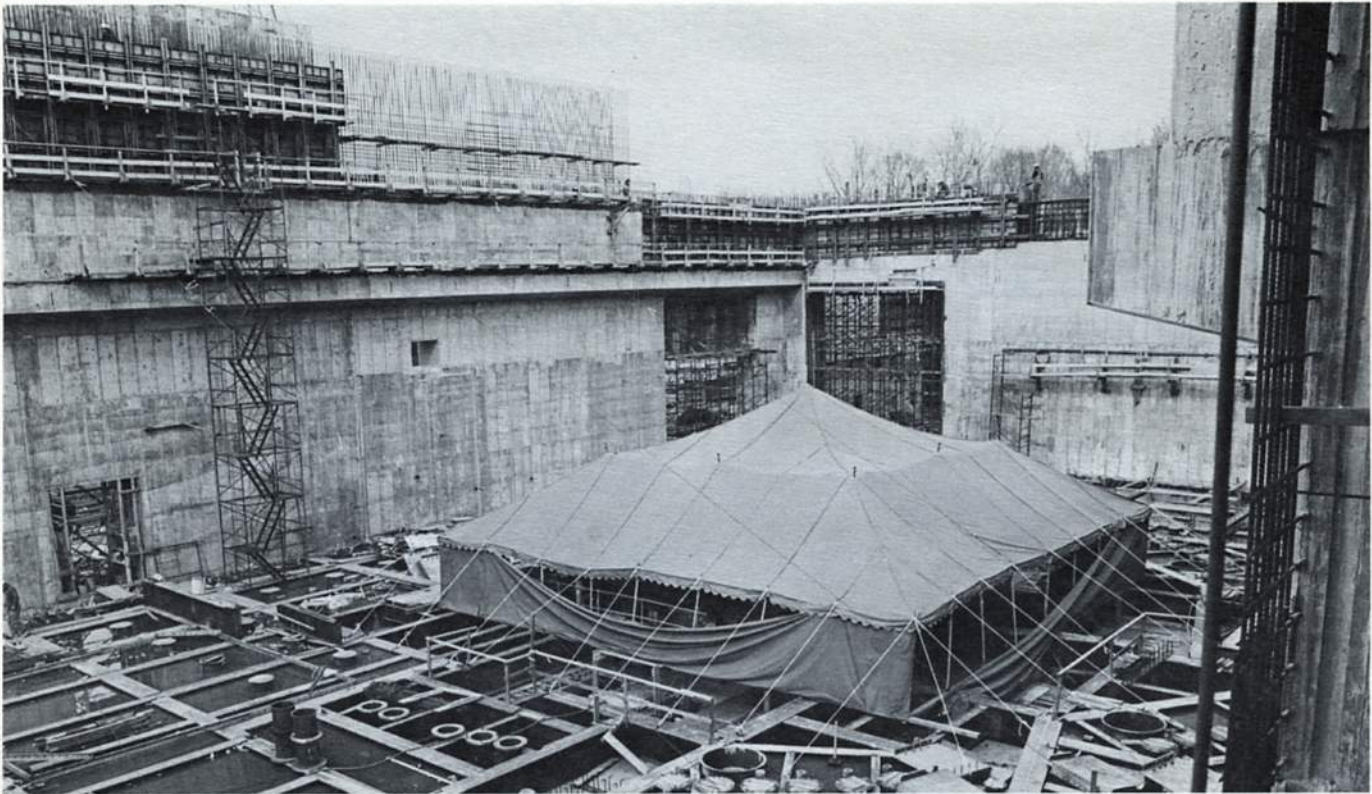
This photo, looking west, was taken in January, and provides an overview of the construction area. Construction of the upper level of the Neutral Beam Power Conversion (NBPC) Building awaits completion of the adjoining TFTR Test Cell wall that will support the NBPC building roof. Construction of the below-ground level of this building is finished, and cables and equipment are being installed. To the east of the Motor Generator building, a 2 MW diesel generator has been installed; it will be used as an emergency back-up power supply.



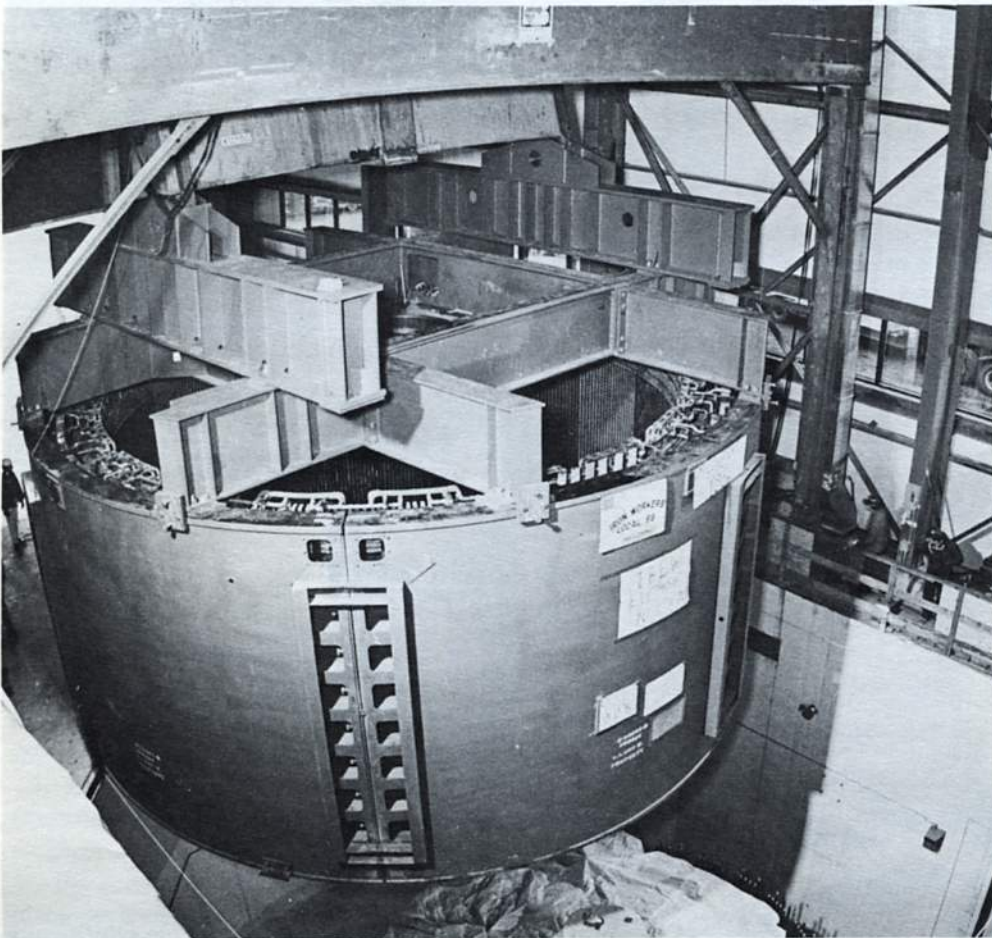
Much was accomplished in the TFTR Test Cell during February. This photo shows the assembly of the stainless steel substructure (center) that will support the tokamak and work on the Test Cell walls. When complete, the reinforced concrete walls will be 60 feet high and 4 feet thick.



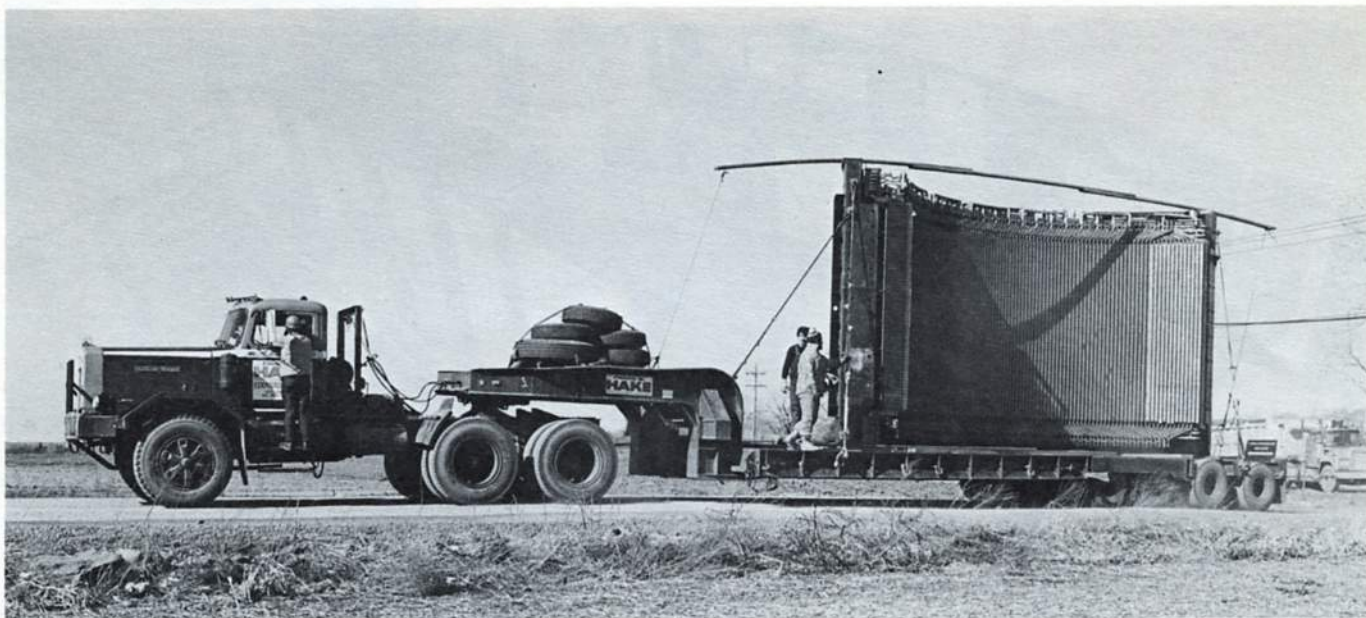
Workers on the substructure.



In March, the central area of the test cell was covered with a tent so that work could progress during inclement weather.



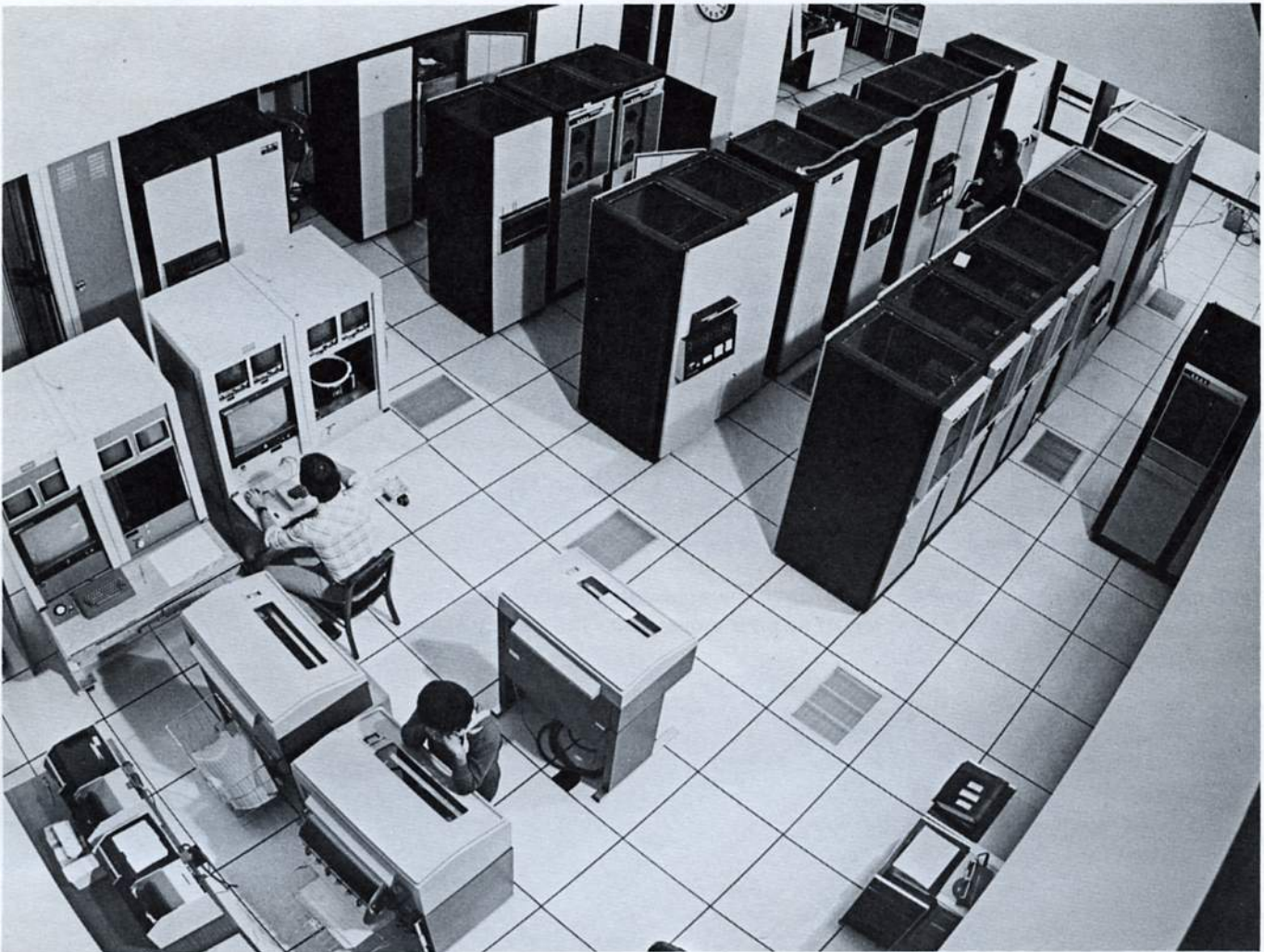
March was also a busy month in the Motor Generator Building. The first 350-ton stator assembly is shown here being moved from the staging area to a temporary home in motor generator pit number 2. When construction of the rotor assembly in pit number 1 is complete, it will be moved there permanently.



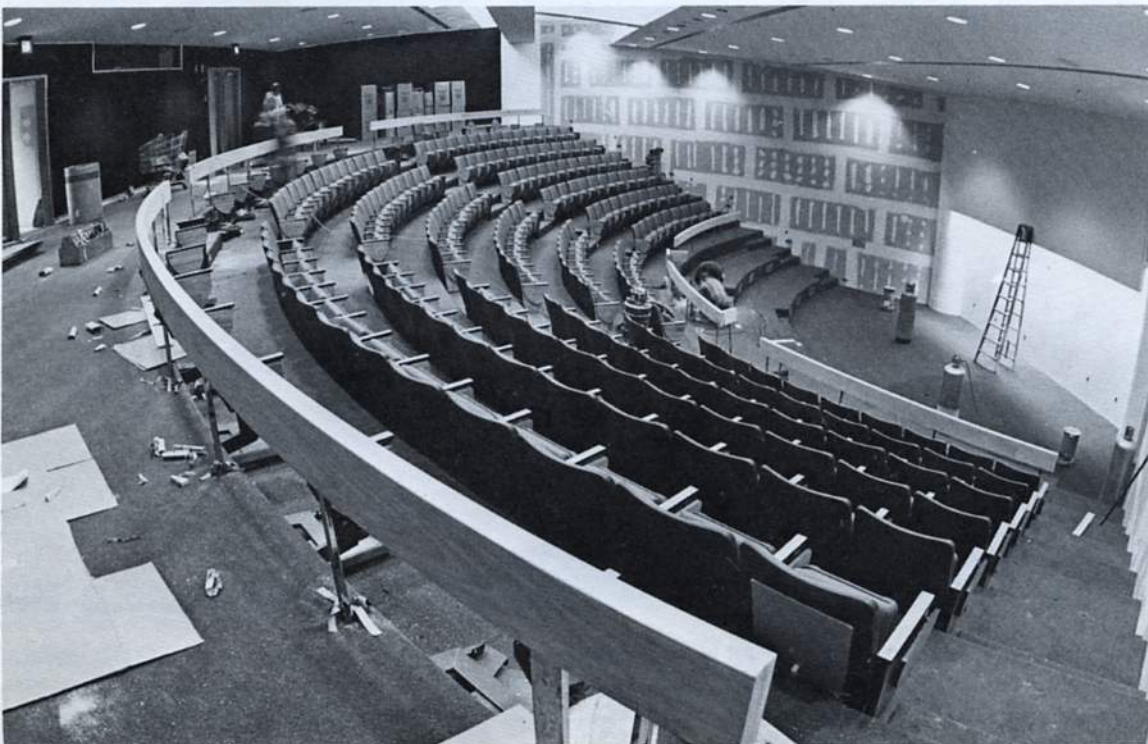
On the road with the stator section. During March the second motor generator stator was delivered to PPL in three sections one of which is shown here. The stator will be assembled in the MG staging area.



Within the west wing of the Lab/Office Building, the TFTR visitors' gallery is complete. The windowed viewing area on the left overlooks the TFTR control room; the one on the right overlooks the computer room.



The CICADA computer system viewed from the visitors' gallery.



The PPL auditorium in the Lab/Office Building west wing is nearly complete.