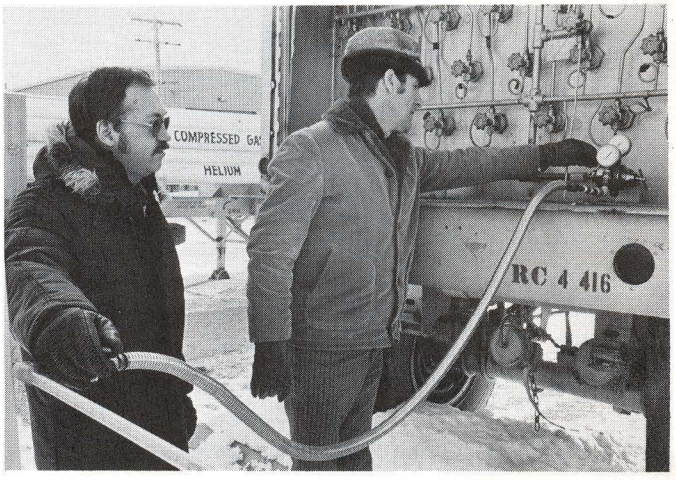
Operated by Universities Research Association Inc.
Under Contract with the Energy Research & Development Administration

Vol. 8 No. 48 47 December 16, 1976

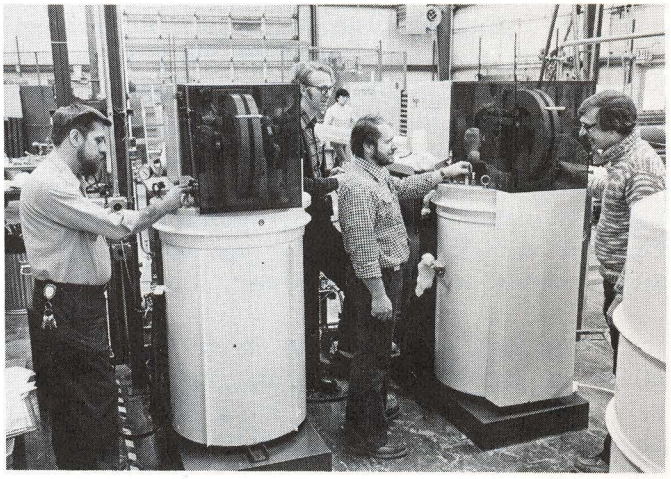
HELIUM RECOVERY PLANT OPENED HERE

A new facility recently brought into operation at Fermilab takes the Laboratory an important step forward in the use of superconducting technology. The new plant, commissioned last week, will recycle helium used in superconducting magnets in the experimental areas. Efficient recycling of helium means lower operating costs as well as conservation of a valuable natural resource. Lab 6 in the Village was chosen as the site for the new helium facility. The planning and installation of the system was a combined effort of the Meson Department and Research Services (under the direction of Paul Mantsch, Associate Head of Research Services.)



...(L-R) Bob Horbus, Howard Hart check flow of helium gas to manifolding at Lab 6...

When certain metals are reduced and maintained at temperatures near -452°F., their resistance to electrical current disappears and they become "superconductors." Since magnets made with superconducting coils have no electrical resistance they consume a tiny fraction of the electrical power used by conventional magnets. Liquid helium is used to maintain the extreme cold needed by superconducting magnets. In the magnets the helium liquid at a temperature of -452°F. slowly evaporates into gas. The helium gas must be collected and turned back into liquid for reuse. Equipment in the new facility will be able to reliquefy all of the helium needed in the experimental areas.



...(L-R) Bob Bennett, Morris Binkley, Buzz Rodewalt, Paul Mantsch at CTI 1400 liquefiers...

There are a number of superconducting magnets in routine operation at Fermilab. The spectrometer at the Internal Target Area and the 15-foot bubble chamber use superconducting magnets. Being permanent installations, each has its own helium plant. Five large superconducting magnets have been designed and built by the Cryogenics Group under Ron Fast for use in the experimental areas. A number of other magnets of this type are being designed or are under construction. The magnets are designed to be moved around as the experimental program demands and are serviced with liquid helium in portable dewars. Four of these magnets are now in use in experiments in the Meson Area. A system to collect and store the helium gas from the magnets has been installed in the Meson Area. The gas is sent by tube trailer to Lab 6 to be reliquified. A diagram on Page 2 shows the complete helium recovery cycle.

(Continued on Page 2)

HELIUM RECOVERY CYCLE AT FERMILAB.....

A system of pipes gathers the helium gas and stores it in a large rubber bag. The helium is pumped from the bag into tube trailers at high pressure (2500 psi). The tube trailers are then moved to the new liquefaction plant. Purifiers first remove traces of air and water vapor picked up by the helium gas along the way. Liquifiers then cool the purified gas until it condenses into liquid. The liquid is stored in dewars which are returned by truck to the point of use.

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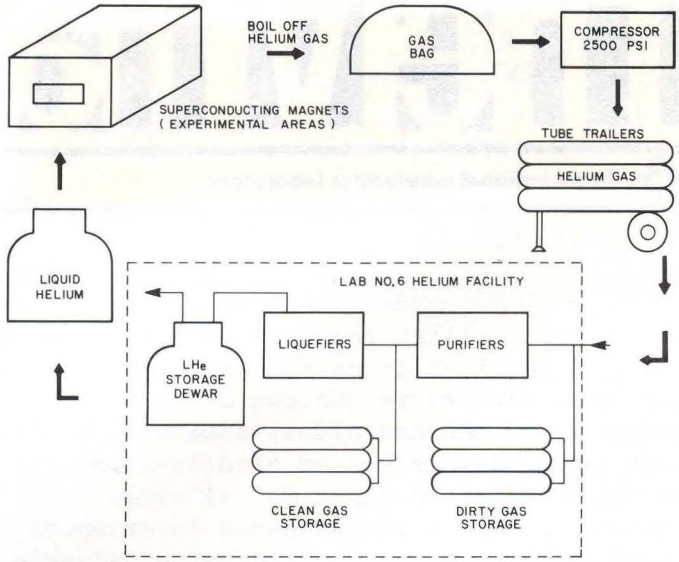

Work on the plant was started at the beginning of October. Equipment was collected from all parts of the Research Division. One liquifier was moved from the central Laboratory. A second liquifier, purifiers and dewars came from Lab 8. Helium gas storage tanks and tube trailers were obtained through federal excess sources. In its final form the system will purify and liquify helium at a rate of 70 liters per hour, will have 8500 liters of liquid storage and gas storage equivalent to 16,000 liquid liters.

A crew within Research Services, under Morris Binkley, will have the responsibility for operating the new facility, and for servicing the superconducting magnets and the recovery system in the Meson Area.

The new system came into operation several days ahead of schedule, according to Dr. Mantsch. "We are all very pleased to see this facility operate so well. This is a tribute to the fine efforts contributed by many people."

Fermilab buys about 15,000 liters of liquid helium each month. About 70% is used in superconducting magnet development and testing; the rest is used in magnet systems and for replacing normal losses that occur in operation and handling. The United States is one of the few countries with an abundant source of helium as a constituent of natural gas. The rapid increase in the use of liquid helium enhances its value as a natural resource and its conservation is important.

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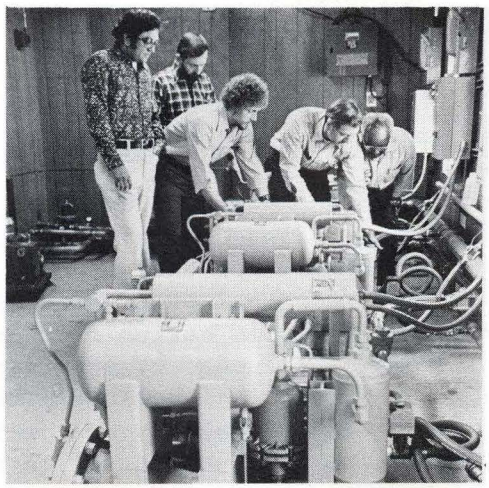
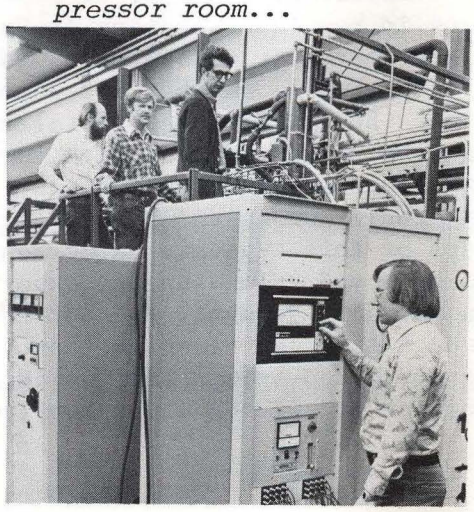


...(L-R) Umar Patel, Bud Koecher, Bob Jensen, Leo Ray, Curt Danner in compressor room...



...Roger DeNeen, Peter Yonker, Ron Fast, Chuck Grozis adjust purification system...

SPORTSMEN HONORED

...(Left photo) Rich Krull (Physics Department) is Fermilab's 1976 tennis champ. Here he receives a trophy from Helen Ecker, Recreation Supervisor, after the winning match against Jim Walker at the Aurora Tennis Club. (Right) "Morgan's Raiders" became '76 volleyball champs after defeating Main Ring Power Supply's team. Winners, (L-R) Doug Bamford (Communications), Joy Thomas (Purchasing), Tom Callans (Accounting), Capt. Joe Morgan (Purchasing), Terry Korienek (Fab Procurement), Jim Jensen (Accounting), Carolyn Longland (Purchasing)...

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ACCELERATOR DIVISION ACHIEVES THREE NEW INTENSITY RECORDS

Three new intensity records were set by the Accelerator Division in less than two weeks. The linear accelerator reached a peak current of 301 milliamperes, or about 6.5×10^{13} protons, following installation of a new high gradient column and extensive tuning that followed. The steadily rising currents injected by the Linac into the Booster accelerator meant new instabilities in the Booster. Correcting these led to a record 3.01×10^{13} protons being accelerated to 8 BeV in the Booster on Saturday, December 10. Improvements in the Booster radio frequency accelerating system and in the Main Ring brought increased efficiency in beam transfer between the two machines, leading to a record 2.47×10^{13} delivered by the Main Ring at 400 BeV on Sunday, December 12.

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FAMILY DAY TOURS SCHEDULED

Two Family Day tours will be offered by the Public Information Office during the holidays for the benefit of employees' and visitors' holiday guests and for students at home during the holidays. The dates: Tuesday, December 28, 10:00 a.m. and Wednesday, December 29, at 2:00 p.m.

A new slide presentation about Fermilab, done by Hawkeye Associates of Madison, Wisconsin, will be shown at these tours. The show, titled, "Fermilab", is being marketed by Hawkeye to high schools as a film strip. It is a 25-minute layman-level production with audio narration. The Family Day tours will include a walk through the Linac gallery and the main control room. Reservations are necessary as the tour is limited to 25 persons. Call Cheryl Stadtfeld, Ext. 3351.

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HOLIDAY SCHEDULE: Fermilab offices will be closed on Thursday, December 23, Friday, December 24, and Friday, December 31. Food service hours on these dates will be: Breakfast, 8-10 a.m.; lunch, 11:30 a.m. to 1:30 p.m. (grill only). No evening service will be available. No food service will be available on Christmas Day and New Year's Day.

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WALTON TO SPEAK AT CHRISTMAS LECTURES

Ernest T.S. Walton, who, together with John Cockcroft, received the Nobel Prize for pioneering work in transmuting atomic nuclei, will be one of four distinguished lecturers at the Christmas Lectures of the Illinois Science Lecture Association. The device they used, now known as the "Cockcroft Walton," is a common tool of present-day high energy physics laboratories as a generator of the particles used in larger accelerators. Prof. Walton visited Fermilab in November, 1975, and spoke to a colloquium here about the Cavendish Laboratory. He will speak at 2:30 p.m. on Thursday, December 30, in Thorne Hall of Northwestern University's Chicago Campus, Lake Shore Drive and Superior Street, Chicago. His subject will be, "A Century of Discoveries of Cavendish Laboratory."

The Christmas Lectures are modelled after the famous London Royal Institution programs founded by Michael Faraday in the 1800's. They are directed by representatives of three Chicago universities -- Northwestern University, the University of Chicago, and the University of Illinois Circle Campus. Other lecturers on the 1976 program are E. Margaret Burbidge, former director of the Royal Greenwich Observatory (1:30 p.m., Wednesday, December 29) ; Vitaly L. Ginzberg of the Lebedev Physics Institute of the USSR Academy of Sciences (3:30 p.m., December 29); Eugene N. Parker, astronomer of the University of Chicago (1:00 p.m., December 30).

The four lectures are offered at a cost of $3.75. For more information call 337-1595.

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EXHIBITS CONTINUE HERE

The wood carvings of Del Venters, technician in Fermilab Research Services, will be on display in the Atrium of the Central Laboratory through December. An outgrowth of his love of wildlife, Venters' carvings of birds and game are a delight to both children and adults.

The exhibit of selected landscape prints of Hiroshige continues in the second floor lounge of the Central Laboratory. The exhibit is on loan from the Art Institute of Chicago.

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The Protons basketball team is on the move, according to Roy Justice. "Due to their great speed and stamina, the Protons were able to accelerate to a higher level in their last game," he reports. Playing in their first double overtime game they eeked out a 69-68 victory over Brown's Motel and now own a 3-0 record and will endeavor to bring home victory after victory for the glory of Fermilab, Justice says.

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The Argonne Credit Union Office at Fermilab will be closed Thursday, December 23, and Friday, December 24, and also Thursday and Friday, December 30 and 31st.

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CLASSIFIED ADS

FOR SALE - 12-ft. Trihull boat, $125; 2-hp Evinrude outboard, $195; 1-pr. 7-ft. glass skis, $35. Contact, D. Tokarz, ext. 3862, beeper 296.

WANTED - "Felices Pascuas to all". Please remember to save me the stamps from your holiday mail. Graciela Finstrom, CL 6W.

FOR SALE - 1 console stereo; 1 hutch; 1 dresser; 2 end tables; 1 coffee table (set) - Best Offer. Call N. Sebby, ext. 4419.

FOR SALE - '73 gold Grand Prix, excel. cond., vinyl top, power door locks, steering, brakes, windows; am-fm stereo; air-cond.; low 30's - $2900 firm. Call Jan 897-3932.

WANTED - Good loving home for neutered male Shepherd/Lab mix; 1-1/2 yrs. old; friendly disposition. Call 232-8290.