FERMINEWS

Fermi National Accelerator Laboratory

Operated by Universities Research Association Inc.
Under Contract with the United States Department of Energy

Vol. 3, No. 17

April 24, 1980

WORLD'S LARGEST LIQUEFACTION FACILITY PRODUCES FIRST AMOUNT OF LIQUID HELIUM

Fermilab's Central Helium Liquefier Facility produced its first quantity of liquid helium at 1:00 p.m. on April 18, thereby becoming the world's largest facility of its kind.

With congratulations echoing all around, the facility ran smoothly, producing approximately 2,000 liters of liquid helium each hour, about half its maximum capacity. The staff was still interested in having the facility "tuned up for stability," explained Ron Walker, head of the CHLF Group. "We've been cooling down very slowly since 11 p.m. yesterday (April 17)," he added.

Walker described the production of the facility's first liquid helium as "our biggest milestone. I don't believe we'll make a bigger one than that. We successfully put together all the phases that had to work correctly at the same time. Everything is essential. Nothing could fail."

The CHLF crew ran the facility until Saturday morning, when it was shut down. Then on Monday morning, operation resumed. In the months ahead, Walker and his staff will be trying for "the maximum rate we can get. We plan to conduct operating exercises and to determine what our maximum capacity is."

For that first run, the liquid helium was not stored but was recycled through the facility. A heater designed and built by Fermilab warmed the liquid helium to room temperature, and the gas was then recycled to the compressors.

Although now essential to the operation of the facility because as yet the liquid cannot be stored, the ingenious heater will have a useful role in future years. When the facility goes into a stand-by mode, any excess liquid helium will be warmed and recycled through the facility.

As Walker explained, "You can't change a big facility like this instantly. It has a mind of its own. We have to change things very slowly."

Andy Mravca (left), area manager of the Batavia Area Office of the Department of Energy, and Phil Livdahl (center), Fermilab acting deputy director, congratulate Ron Walker, head of the CHLF Group. In the background is one of the compressors.

The liquid helium produced by the facility--approximately 4,500 liters each hour, when the facility is fully running--will be used to help cool 1,000 dipole and quadrupole magnets to superconducting temperature, minus 452°F. The magnets will make up the superconducting accelerator that Fermilab is now building. At these low temperatures, special conductors in the magnets lose their resistance to the flow of current through them. Consequently, high magnetic fields can be created with the use of considerably less power than would be required for conventional magnets that run at room temperature.

When the superconducting accelerator begins running, it will herald a new era of high energy physics research for this country. Particle energy levels of 1,000 GeV will be possible, more than twice that of the present conventional accelerator here.

The first phase of the new construction will also see the development of the "collider" in which 1,000 GeV protons

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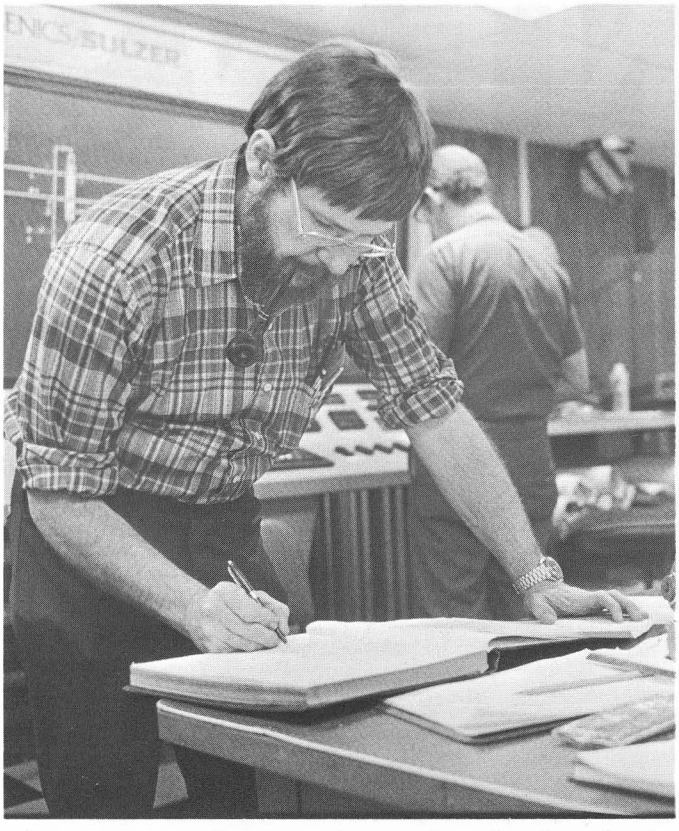


Jim Hoover makes an entry in the log book. He was the crew chief who recorded the exciting moment when liquid helium was first made at the facility. In the background at the control panel is Warner Robertson, of CTI.

(Continued from Page 1)

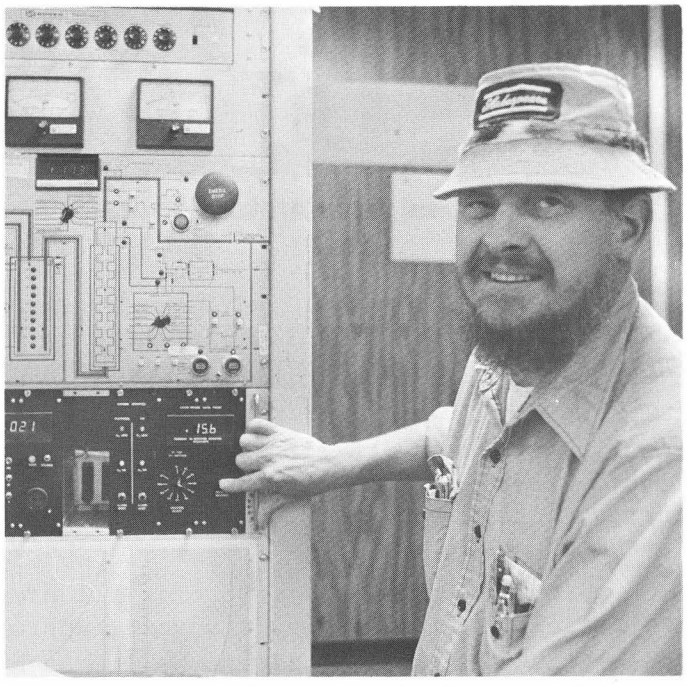
and 1,000 GeV antiprotons will smash head-on for physics results not possible anywhere else in the world.

Some of the major components of the CHLF came from a liquid propellant plant once located in California. The facility, on the General Services Administration excess property listing, supplied liquefied oxygen and nitrogen to the missile program in Ventura County north of Los Angeles.

Recognizing that such a plant could be adapted to liquefy helium gas, a task force from Fermilab visited the plant and decided to move the major elements here. Even allowing for the refurbishing that was necessary, the move saved millions of dollars over building an entirely new facility.

The first piles for the CHLF were driven in June 1976.

The development of this liquefaction facility represents one of the practical applications that particle accelerators contribute to industry as physicists pursue



Delbert Wilslef pushes the button that actuates the bottom level indicator (a carbon resistor). The reading of 15.6 milliamperes of current flowing through the resistor indicates it is immersed in liquid helium. If the resistor was still in vapor, the reading would have been 28 ma. This is one way the CHLF crew determines the level of liquid helium.

their study of subnuclear entities. Large liquefiers will be necessary in the future as more and more practical applications of superconductivity lead the way to energy savings. Once feasibility and reliability of such facilities have been demonstrated in the operation of high energy physics accelerators, industry absorbs the technology and eventually it becomes a part of the national market place.

"From the industry point of view, this new facility is a milestone," said a representative of Helix Process Systems, manufacturer of the liquefier, otherwise known as the "cold box." "This type of challenge provides incentive for us in industry to do innovative things."

Since 1965, cryogenic technology has spread rapidly. Applications for cryogenics are increasing in many research and industrial disciplines such as superconducting power generation and transmission, high-energy physics, vacuum technology, space communications, optoelectronics and energy production.

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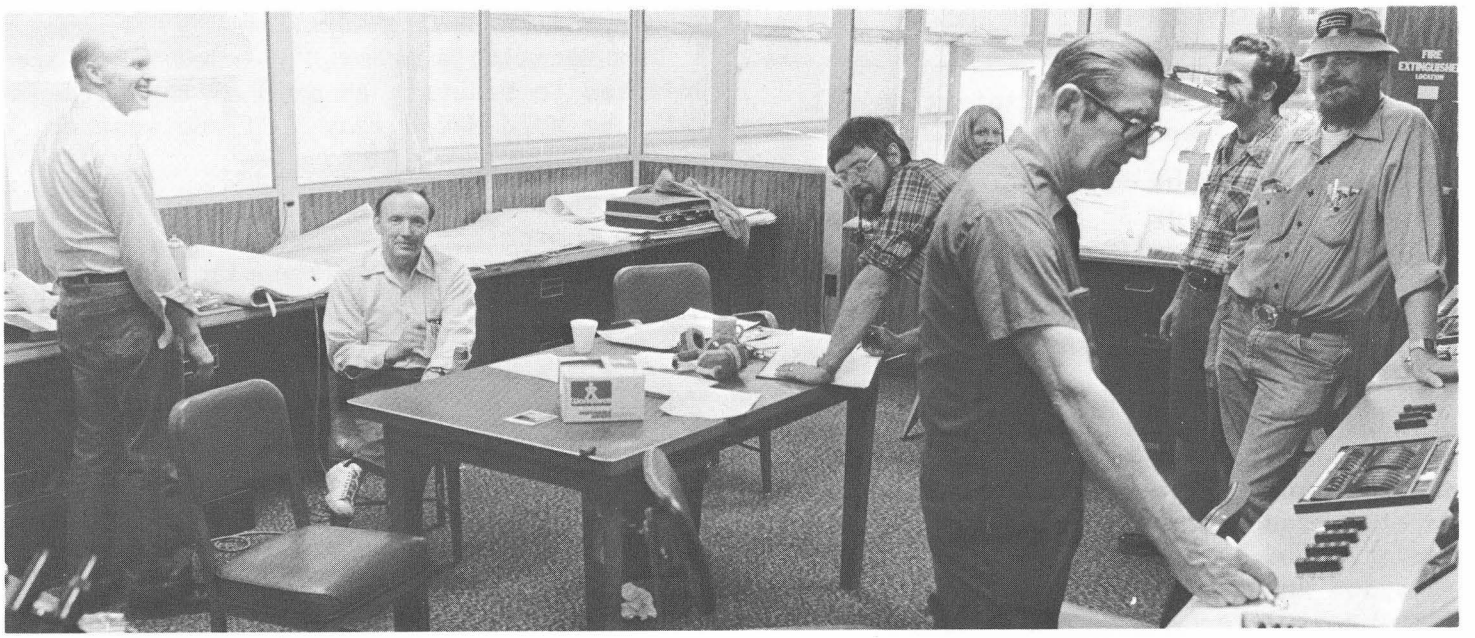

Jubilant at their success, CHLF staff members celebrate the historic occasion. Left to right are Reid Rihel, Ron Walker, Jim Hoover, Cathleen Edgecombe, Warren Robertson, Gary Hodge and Del Wilslef.

THE PEOPLE WHO MADE IT HAPPEN

The Central Helium Liquefying Facility is part of the Cryogenic Systems Department headed by William Fowler in the Energy Saver Division. Associated with the development of the CHLF have been:

Richard Ahlman, senior tech, who worked on the cold box installation and operation and compressor installation and operation.

Henry Barton, physicist, produced the sequencer programs for the TI 5000 programmable sequencer and cold box wiring and leak tests, and proposals for computer installation.

Rick Bossert, tech, drafting of as-built systems; electro-mechanical technician; operating crew member.

Georgia Brown, mechanical technician, operating crew member.

Jim Harder, senior tech, operating crew chief; compressor maintenance expert, leak test expert.

Jim Hoover, senior tech, controls wiring, design and calibration; operating crew chief.

Gary Hodge, senior electro-mechanical technician, controls wiring and design, data panel design, operating crew chief. Worked on purifier, motor control center, screw compressor, and gas purity monitor expert.

Peggy Price, engineering physicist, engineering support, heater design, controls wiring and design; operations chief on shifts; sequencer programming and documentation.

Reid Rihel, project engineer; compressor rework and installation. Plant piping assembly, shift schedules. Operations chief on shifts. Heater design.

James Sabin, mechanical tech, welding, compressor maintenance; operating crew member, cold box maintenance.

Vance Sauter, senior mechanical tech, piping installation, compressor installation, leak tests, components testing.

Ron Walker, physicist, CHLF group leader. Controls design, gas detector R & D, design of plant where needed.

Delbert Wilslef, senior electrical tech, plant wiring, transducer installation and calibration; operating crew chief; cold box wiring expert.

Greg Wilslef, electro-mechanical tech, electronic circuits, plant maintenance, operating crew member.

Consultants from industry have included Peter VanderAhrend who originally conceived and designed the plant; Mike Morgan, plant engineering and design; Warren Robertson, field engineer, plant turn-on; Frank Kadurka, cold box design.

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PHYSICS WORKSHOP AND USERS ANNUAL MEETING TO BE HELD MAY 1 AND 2

The Fermilab Users Organization will hold its annual meeting Friday, May 2.

In conjunction with the users meeting, Fermilab is planning an all-day workshop on Thursday, May 1, dealing with hadron and photon physics at 1 TeV. Both the meeting and the workshop will be conducted in the Central Laboratory auditorium.

The morning agenda for the workshop includes invited talks on physics opportunities at 1 TeV. After lunch, the workshop will continue with submitted presentations concerning additional physics opportunities, practical and impractical beams and instrumentation and techniques. Charles N. Brown, associate head of the Research Division, is coordinating the workshop.

"This year is a critical period in planning for a program of fixed target hadron and photon physics at 1 TeV," said Brown. "The Laboratory feels it is appropriate to commence this activity with a workshop on the physics issues and techniques appropriate to a 1 TeV program."

The next day, the users annual meeting will begin at 9:30 a.m. with a report from the Users Executive Committee given by John Rutherfoord, chairman of the committee. Then Norman F. Ramsey, president of Universities Research Association, will give his report about the URA.

Other program speakers include Leon Lederman, Fermilab director; J. D. Bjorken, Fermilab physicist; Rich Orr, head of the Energy Saver Division; Don Young, head of the Colliding Beams Group; and Alvin Tollestrup, head of the Colliding Detector Facility.

The users meeting will continue the theme of the workshop with John Peoples, head of the Research Division, describing the upgrade of the experimental areas. Brown will then outline the early Tevatron program and Lederman will close out the program with his talk on Tevatron physics and the future.

Forms for nominating scientists to the Users Executive Committee may be obtained in the Users Office, CL1-E. Six of the committee's 13 members are to be elected.

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ARBOR DAY TO BE HELD MAY 8

Fermilab's Arbor Day--when trees are planted to beautify an area of the site--will be held May 8 (May 9 if the weather is inclement).

This time the Meson Area will be given the personal attention of many employees and users. Tree planting will begin at 11 a.m. Taxis will be available at that time in front of the Central Laboratory to take employees to the planting area. Refreshments will be served.

Of the 88 trees that will be planted, 10 are greenspire linden, 10 royal red maples, 10 Norway maples, 10 shade master locusts, 15 van Eseltine crabs, 8 red maples and 25 Colorado spruce.

Bob Lootens and Tony Glowacki are responsible for the landscape plan; Jose Poces and Ruth Ganchiff, publicity; Betty Brown and Margaret Meister, refreshments and promotional inducements; and Bob Hall, transportation.

Last year, trees were planted in the area next to the Central Helium Liquefier Facility.

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CHEZ LEON MENUS

Tuesday, April 29 - 7:00 p.m. - $8.00

Cream of tomato soup
Seafood kebabs
Saffron rice
Mushroom, spinach and pepper salad
Italian rice pudding

Wednesday, April 30 - 12:30 p.m. - $4.50

Cucumber soup
Selection of stuffed vegetables
Viennese custard

Thursday, May 1 - 7:00 p.m. - $8.00

Shrimp filled avocado shells
Stuffed flank steak
Asparagus with lemon butter
Yam puree
Strawberry cream puffs w/grand marnier sauce

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