

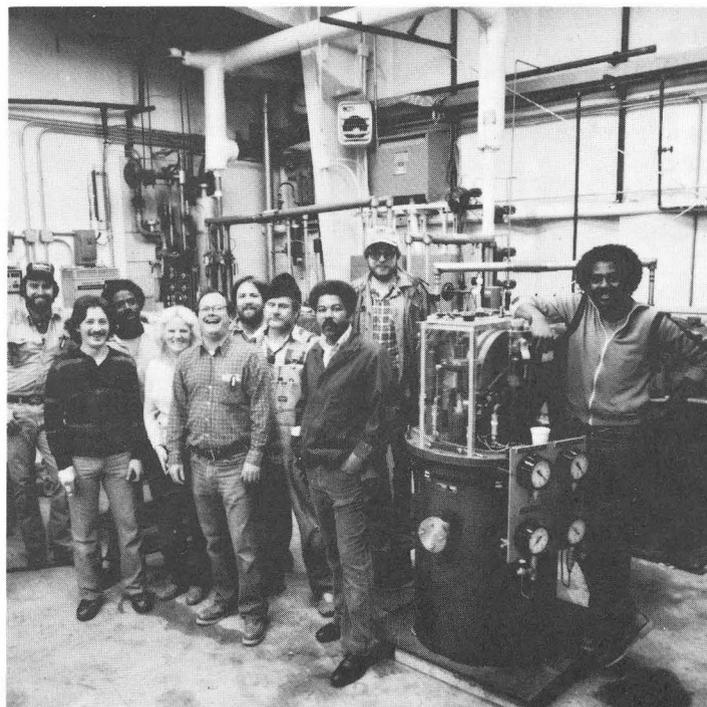
MESON M6 MAGNETS MAKE MILESTONE

by Herman Haggerty

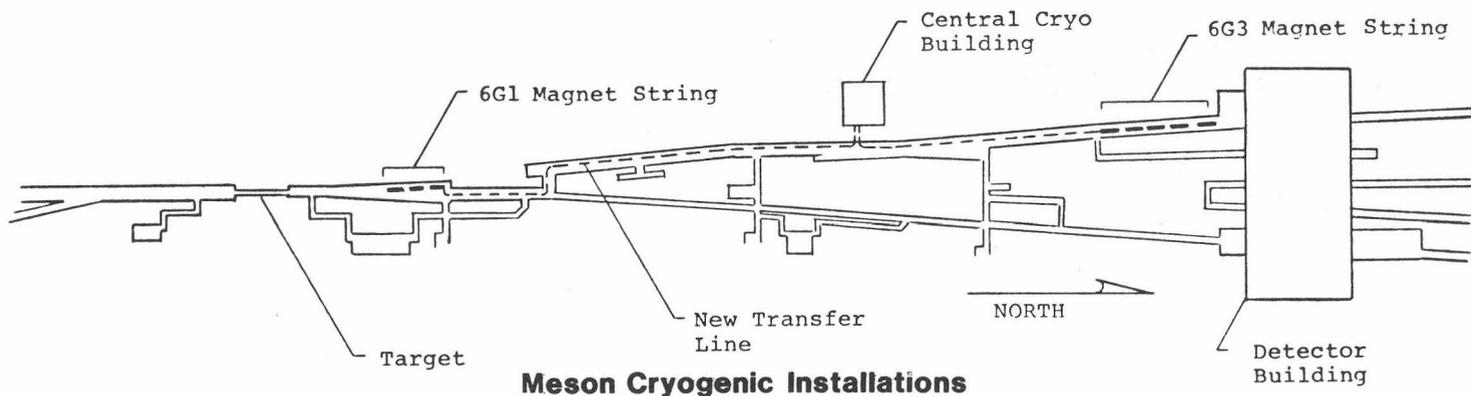
A significant milestone in the Meson Department's program to upgrade beam-line capabilities and save electrical energy in the process occurred on November 19 when five more vintage Energy Doubler/Saver dipole magnets were "cooled down" to superconducting temperature by the Meson "Satellite" refrigeration system. The five magnets are located in the M6 beam line about 400 feet from the refrigeration system. The increased magnetic field strength of these magnets allows 400-GeV operation in the M6 east line and future 800-GeV operation in the M6 west branch.

With the addition of these five magnets the total number of Energy Doubler/Saver dipoles in the M6 line is eight. Three other magnets have been operated for about two years with a small local refrigerator. More significant than the total number, however, is the technique of cooling these magnets. A single large transfer line has been installed inside the Meson beam tunnels. This line will provide helium to cool all Meson Tevatron-era superconducting magnet strings. Masterminded by Meson's head cryogenic engineer, Umer Patel, this helium header system promises the capability of immediate utilization of the coming Tevatron beams. Operating in close analogy to a municipal water system, the liquid helium "main" can be tapped in several locations for future magnet installations. Clever valving developed by Kurt Krempetz, Meson cryogenic engineer, will allow simultaneous installation of new strings and operation of old strings.

The long, low-loss transfer-line components were built and installed in record time by a Meson task force of John Caffey, Jerry Sasek, Ed Justice, and Al Schoeberlein with welding artistry provided by Bill Gatfield and John Jones. Thorough in detail and →



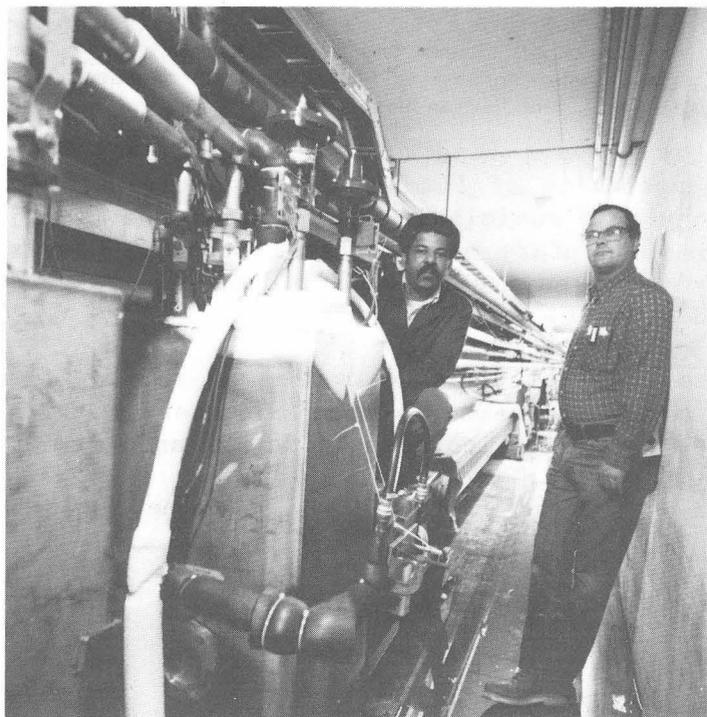
Meson Cryogenics Group in the Meson Central Cryogenic Building next to the satellite refrigerator (left to right) Bill Gatfield, Jim Probst, Reginald Gibbons, Jenny Lazar, Terry O'Brien, Kurt Krempetz, Al Schoeberlein, John Caffey, John Jones, Ed Justice (not pictured are Umer Patel and Herman Haggerty).



(cont'd. from pg. 1)

—→dedicated to perfection, this group's efforts resulted in leak-free, trouble-free cryogenic components. Vacuum systems integration led by Jim Probst likewise was flawlessly implemented. The electronic monitoring and control system developed by Terry O'Brien, Reginald Gibbons, and John Bell (with engineering support of Paul Czarapata and John Stoffel) provides a central command post for operation of the cryogenic system. The "satellite" refrigerator provided by Dick Andrews' group and commissioned by John Caffey, Terry O'Brien, Kurt Krempetz, and Umer Patel, demonstrated once again its high reliability through excellent engineering.

As the systems all came together and worked in harmony on the 19th, it was apparent to those in the Meson Cryogenic Control Room, that a new era in Meson was at hand. The last vestiges of power-hungry conventional electromagnet technology were giving way to the economical and potentially unlimited application of superconductivity. We eagerly await the Tevatron's high-energy beams and their promise of deeper revelations of Nature's rules.



Looking down the M6 superconducting beam line. John Caffey (left) and Terry O'Brien stand next to the magnet feed box which feeds current into the magnets and makes the transition between room temperature and liquid helium temperature.

NEW THEORY LECTURE SERIES

"QCD, QFD, GUTs, and All That,"--not a cereal box list of ingredients or a cryptographic code--but the topic for the present series of theoretical lectures on Mondays and Thursdays, at 1 p.m. in Curia II. The lecturer "for all that" is Fermilab theoretical physicist, Christopher Hill. The series began Monday, November 30.

The second set of lectures, "An Introduction to Non Perturbative Approaches to QCD," by Hank Thacker of Fermilab's Theoretical Physics Department, is tentatively scheduled to begin Monday, January 4 and run through January 14.

The lectures are intended for Fermilab staff, graduate students, and visiting scientists.

EVENING CLASS REGISTRATION

A microprocessor applications course will be offered at Fermilab beginning January 14. The course will be taught by Jim Zagel of Fermilab and is accredited through Waubensee Community College. The meeting time is 5:30 to 9:30 p.m. on Thursday evenings through May 6. For registration information contact Barbara Graves, ext. 4367.

CALLING ALL BLOOD DONORS!

The Aurora Area Blood Bank will hold a blood drive at Fermilab on December 30. Anyone who wishes to donate blood should register in the cafeteria between 11:30 a.m. and 1 p.m. on December 29. Blood donations will be taken the next day from 9 a.m. to 2 p.m. in the WHISE conference room.

Anyone who has questions about his qualifications as a donor, or about the drive itself, should call Dorothy Poll in the medical office, ext. 3232.

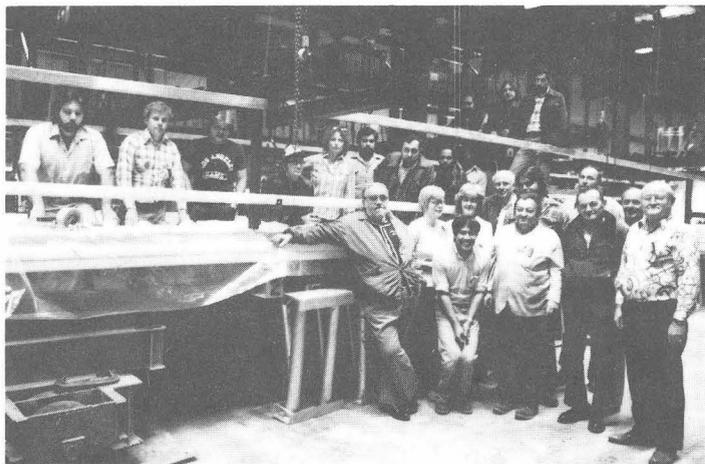
MERGER IN CONTRACTS

Looking for Fabrication Procurements Services and/or Contracts Department? The two departments are now combined under Ed West, and they have a new home, the south end of 5W in Wilson Hall, M.S. 216.

Technical advice, assistance with drawings, tolerances, etc., will be available as usual from the combined Contracts Department.

Coordination, Congeniality, Capability

COLLABORATE TO PRODUCE GIANT COILS



Coordinated dayshift conventional Magnet Facility personnel who deserve credit for completing the E-605 coils are (front row, left to right) Rich Isiminger, Inpeng Samayavong, Geno Olszanowski, Emery Lukitsh, Lester Bradstreet; (second) row Marta Johnson, Mary Brooks, Paul Tomell, Dan Mills, Jim Humbert, Randy Lenz; (third row) John Chyllo, Mark Shoun, Len Davis, Ralph Ovitt, Jan Clark, Jim Rife, Jack MacNerland, Richard Thomas, Larry Griffin; (upper row) Jim Wright, Vic Ecker, Wally Medernach.

All four giant coil assemblies, weighing 95 tons in total, for Fermilab Experiment 605 (see Ferminews, September 17, 1981) have been completed and are being installed on the iron yoke in the Meson Detector Building. Working around-the-clock since June, the conventional Magnet Facility took the preformed layers, sprung the individual turns apart, and applied a total of approximately 5 miles of epoxy glass tape to the 2-1/2 inch square conductor. Completed 3- or 4-layer coils were wrapped with tape and heated electrically to 300°F to cure the epoxy.



Congenial afternoon shift responsible for coil completion (first row) are Bill King, Dominic Carullo, Dorothy Taylor, Isidro Gonzales, Anne Rogers; (second row) Howard Brooks, Jorge Dorado, Tony Barba, Pablo Rodriguez, Jack Jagger, Paul Sanders, Oscar Guerra, Tim Griffin.



Capable midnight shift responsible for working on the coils are Bob Campbell, Charles Stockstill, Pat Schmidt, Roy Mercado, Jr. Jones, Ken Schlindwein, Ken Foster; (top) Mike Reynolds.

ARMS CONTROL EXPERT TO SPEAK HERE TONIGHT

Dr. William Perry, former Under Secretary of Defense for Research and Engineering, will speak tonight, December 10, on the topic of "Strategic Modernization and Arms Control." The talk by the former Carter Administration member and expert on defense systems dealing with high technology will be given in Ramsey Auditorium at 8:30 p.m.

The lecture is the third in the Arms Control and International Security Seminar Series which is free and open to the public. The talks are sponsored by the League of Women Voters and coordinated by Fermilab and Argonne National Laboratory scientists. They are designed to acquaint the scientific and lay community with the technical and political issues involving arms control. Dr. Perry has been active in arms control discussions and his lecture should be particularly relevant now that active arms control talks are taking place in Geneva, Switzerland.

NALREC SPONSORS CHRISTMAS FESTIVITIES

The Polka Dots Polka Band, Brother Love and Boogie Masters, Inc. will be featured this year at the Fermilab Employee's Christmas Party on December 22 in the Village Barn. The boogying will go from 5:15 to 11 p.m.

For more information contact chairman Walter Coleman or Rose Muth and Sharon Koteles, co-chairwomen.

Children ages 2 to 7 will host Santa and Mrs. Claus at the annual Fermilab Children's Christmas Party. The festivities will begin December 13 with cartoons in Ramsey Auditorium at 2 p.m. The featured guests will arrive about 2:30 p.m., providing the reindeer are synchronized, with a special little something for all. Punch and cookies will be served in the Cafeteria.

REMINDERS . . .

Laboratory Observes Holidays

The Laboratory will be closed for the holiday season on the following days:

Thursday, Dec. 24, 1981 (half day)
Friday, Dec. 25, 1981 (all day)
Thursday, Dec. 31, 1981 (half day)
Friday, Jan. 1, 1982 (all day)

Holiday Hours For Cafeteria

The Fermilab Cafeteria will observe the following schedule during the holidays:

Thursday, Dec. 24, 1981 - Breakfast only
Friday, Dec. 25, 1981 - Closed all day
Saturday, Dec. 26, 1981 - Grill only
Sunday, Dec. 27, 1981 - Grill only

Thursday, Dec. 31, 1981 - Breakfast only
Friday, Jan. 1, 1982 - Closed all day
Saturday, Jan. 2, 1982 - Grill only
Sunday, Jan. 3, 1982 - Grill only

New Hours For Eola Entrance

In order to reduce the amount of cut-through traffic, the Laboratory entrance on Eola Road will be opened only between the hours of 6 a.m. and 9 a.m. and 4 p.m. and 6 p.m. This change will become effective December 14.

Runners Plan 1982 Activities

The Fermilab Running Club needs your ideas for the new year. On Wednesday, December 16, at noon, all interested runners are invited to meet in Curia II to begin planning future club activities.

Election of new officers, scheduling of new events, and increasing club participation will highlight the agenda. All input is welcomed.

In Emergency Dial 3131

It is not always easy to determine when a situation is an emergency, but it is better to be safe than sorry. Everyone is reminded to give his name, location, and the nature of the situation when reporting an emergency.

The Fermilab Safety Manual gives steps for responding to minor accidents and injuries. In these circumstances one may transport the injured person in his own car, Fermilab cab, or government vehicle. If one is uncertain of the extent of an injury, dial ext. 3131 for assistance.

Keep Personnel Files Current

All employees are requested to keep the emergency notification data in their personnel files current. In the extreme case, it is possible that outdated information could result in either erroneous notification or cause a delay in obtaining approval for necessary medical treatment. To update, correct, or change file information, contact Jane Rubel, ext. 3417, or stop at the Personnel Office, WH15E.

Alcoholic Beverage Restriction

As the holiday season approaches, it is appropriate to remind Fermilab employees, users, and visitors that the Laboratory does not permit the serving of alcoholic beverages on the site except at official functions, in residential quarters, or at the Users Center.

FERMILAB BUDGETS

Leon Lederman

December 10, 1981

I am pleased to report that, on Friday, December 4, President Reagan signed the 1982 Appropriation Bill which covers the budget allocation for high-energy physics, including Fermilab.

In order to clarify what may appear to be a very confusing situation, I would like to review the budget situation as we now understand it.

Facts

We begin by reviewing our tasks. Since 1979, Fermilab has been building a new accelerator, the Energy Saver, which is scheduled for completion in the fall of 1982. In order to capitalize on the scientific potential of this new superconducting machine, there are two follow-up projects: Tevatron I, authorized in 1981 and Tevatron II, authorized in the recently signed 1982 Appropriation Act. Tevatron I involves beams of protons and antiprotons making collisions in the new Saver ring. It is scheduled for completion early in 1985. Tevatron II is designed to upgrade all the existing experimental areas from their present 400-billion volt (GeV) capability to the new Tevatron energy of 1000 GeV. Upgrading will begin in 1982 and will be complete sometime in 1985. A crucial additional task is to utilize the 400-GeV accelerator to carry out research for the U. S. high-energy physics research community. U. S. funding comes in three distinct categories: Operating funds (including R&D), Capital Equipment funds, and Construction funds.

Now for a brief budget history. In 1981, we had \$78.5M in Operating, \$17M in Equipment, and \$24.1M in Construction funds for a total Laboratory budget of \$119.6M. President Reagan's March budget proposal to Congress for 1982 as detailed by the U. S. Department of Energy (DOE) contained \$89.5M for Operating, \$19M for Equipment.

In June of 1981, we realized that the funding levels in the President's Budget as allocated to Fermilab by the DOE were insufficient to carry out the tasks we had in 1982. The drain on operating and R&D budgets of inflation, large increases in power costs, the three construction projects, and the need to operate the 400-GeV program would, we found, require \$8M more in Operating and Equipment. An appeal was made to the DOE for some relief and this stimulated a detailed DOE review of our cost analysis. In September 1981 the DOE added \$1M to our 1981 budget, which had the effect of decreasing our 1982 needs to \$7M. There were indications of an appreciation of our problems by the DOE, and we had some reason for optimism until the September national budget crises and the "12% cut" mandated across the board for all non-defense spending. Fermilab's tentative total Laboratory budget under this edict went down to \$133.5M. However, since no appropriation bill had been passed, we were operating under a "Continuing Resolution" which held us to 1981 expenditures with the deletion of most of the construction items, i.e., a total budget of about \$107M.

The contrast of this last sum and our original \$141 President's Budget allocation was made in a November letter from Secretary of Energy Edwards to Congressman John Erlenborn and gave rise to the widely spread news story of a 24% cut in Fermilab's budget. On November 24, both houses of Congress passed an "Energy and Water Resources" 1982 Appropriation Bill carrying the 1982 funding for Fermilab. It was this bill that was signed by the President Friday. The bill does not specify how the DOE will allocate operating monies to the various laboratories so we must use **informal** and **provisional** numbers suggested to us of \$87M Operating, \$18.2 for Equipment, and \$32.5M for Construction. Thus the Laboratory total is \$137.2M, a "cut" of about 3% from the President's Budget.

Comment

From one point of view, Fermilab management is gratified that, in these times of great economic crises, the Laboratory budget reflects an **increase** from 1981 of about 10% in Operating funds and 15% if we include construction items. This certainly expresses the spirit of the present Administration and the Congress to protect basic research as a long-term investment. It especially reflects an appreciation of the potentialities of Fermilab since the overall budget for high-energy physics in 1982 is up only 4% in a year when the inflation factor is 12%. The problem arises for Fermilab in the contrast of available funding vs. tasks to be accomplished. Here we see a shortage, in Operating and Equipment funds of about \$10M from the sum for which we made our July appeal. We should remember that Construction funds are in general spent outside of the Laboratory, for civil engineering, materials and supplies. The crunch comes in the Operating and Equipment budget which does not cover inflation and which must, in 1982, provide for the tasks as outlined above. In normal times, if there were not enough money, the Laboratory always had the choice of running less or doing less. The 1982 year is unique: we are only scheduled for 21 weeks of operating the 400-GeV program--a bare minimum when we consider that over 500 physicists have worked two to five years constructing equipment and preparing for this research. We cannot slow down the Energy Saver without risking large cost penalties in 1983. Also, the Saver will actually save over \$15M in power bills in a run (~1983-4) of 30 weeks; i.e., we soon will not be able to afford a 400-GeV run. Finally, TeV I and II have already been stretched out by a year or more and are scheduled to spend minimal R&D monies (Operating) consistent with responsibly proceeding to construct their respective projects. **These projects are absolutely crucial to the future of Fermilab.** In our biased view, they are crucial to the future of high-energy physics in the United States.

In summary, 1982 promises to be a very difficult year, if we are to come out without any irreversible damages. I would like to emphasize that the 1982 Operating budget is provisional. We hope to work hard with DOE to improve our position. I hope this presents a balanced view of our funding situation.