FERMINEWS

Fermi National Accelerator Laboratory

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

Vol. 3, No. 4

January 24, 1980

MESON DEPT. INSTALLS NEW SAFETY SYSTEM

The Meson Department has designed and installed a new safety system throughout its research areas and the adjoining sections of the beam lines.

A centralized, modular, solid-state system, it was specifically designed to provide the flexibility necessary for the Meson Area as it upgrades for 1000 GeV physics. Using a fresh approach, the area now has a convenient, efficient, centralized safety system which, as before, ensures that experiments are carried out in a safe environment.

One of the major improvements provided by the system is that conditions anywhere in the experimental areas can be monitored from the Meson Area control room by the operations crew. Several other major features are inherent in the new safety system:

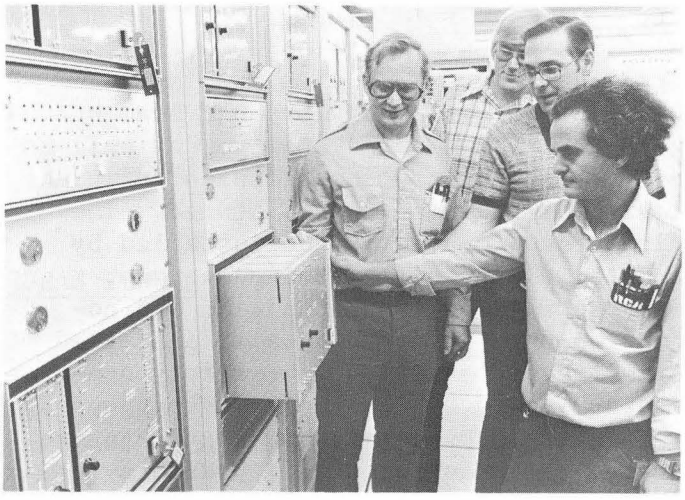
--The system is redundant and self-checking. That is, there are two independent levels of protection provided, and the electronics continually monitors the integrity of the system and interconnecting wiring.

--A network of trunk cables and junction boxes in the experimental areas allows for easy expansion or reconfiguration of any part of the system.

--Much of the electronics is modular and considerably standardized. Repairs and maintenance are simplified as compared to a custom-tailored approach.

--All decision making circuitry is digital in nature for added reliability in electrically noisy environments.

While no precise moment exactly marks the birth of the new system, the original concepts were refined in what Paul Czarapata, head of electrical operations for the Meson Department, calls those "over the coffee types of discussions" during which he and others got a lot of creative planning done. The final design was completed in April of last year and specified a sophisticated, state-of-the-art safety system that has drawn praise from all around, particularly from the Department of Energy.



...In the Meson Area control room, (left to right) Paul Czarapata, Glen Federwitz, Jerry Dyche and Skip McGuire examine the M-4 beam line safety control chassis. The M-1 chassis is at the extreme upper left of the photograph (the one with the key and tag). Just below it is a chassis that services the M-1 chipmunks. At the bottom left of the photograph is the system for the M-2 beam line...

A key element in the new system is an ingenious new optical door sensor using infrared components. The sensors were developed by Czarapata, Skip McGuire, technical specialist and operations manager with the Meson Department, and John Stoffel, now an engineer with Research Services. The photograph on this page shows how the IR sensor works. When the door is closed--such as during a run when access to a protected area is not permitted--the transmitter and receiver are lined up, eye to eye. But when the door is open, they are not aligned and the signal (generated by the transmitter) is interrupted, causing the particular beam line involved to be shut down instantaneously.

The powerful advantage of the IR sensor is that it's fail-safe. That is, if one of the sensors does fail, the beamline is

(Continued on Page 2)

(Continued from Page 1)

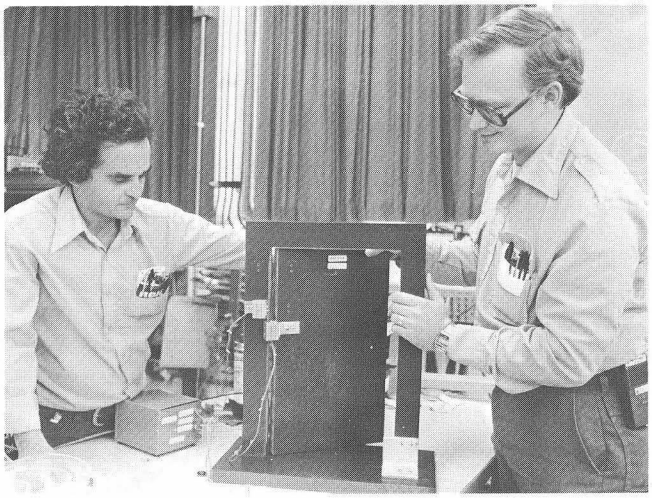
immediately disabled and the operators in the Meson Area control room are alerted. Sophisticated circuitry senses the missing return signal and reports that fact to them. This is considerably different from the old-fashioned, traditional door security system, usually involving mechanical switches, that do not allow continuous verification of switch integrity.

The IR sensors are only part of the overall safety system. There also are radiation monitoring devices and beam status lights that round the system out as well as the main control room electronics to which all signals are sent and monitored. The entire system was built and installed by the Meson electrical operations group. Glen Federwitz is the technician who coordinated the project. He also installed a significant portion of the safety components. Jerry Dyche (really Dychakowsky, but he prefers Dyche) is the draftsman who prepared the printed circuit board layouts and front panel designs. They, along with McGuire, are the principal architects of the new, comprehensive safety system, said Czarapata.

Rich Cantal contributed largely to the construction of the safety system chassis. The Meson Experiment Components Group of Bud Koecher, Cal Grayson and John Williams built and mounted many of the new door sensors. Dan Schoo assisted in the design and construction of the critical device controller module. The Colliding Detector Facility Department did much of the installation in the M5 test beam. Finally, Czarapata credits the Meson Operations Group for doing "a terrific job and putting in many long, hard dedicated hours of work getting the system installed and running."

The popular name throughout the site for a type of radiation monitoring device is "chipmunk." In the Meson Experimental Area, chipmunks are strung together in (what Czarapata calls) a daisy chain system. What he means is that the chipmunks can conveniently be plugged anywhere into centralized trunk lines that extend into the experimental areas and emanate from the main control room. In the past, reconfiguring the pattern of chipmunk monitors involved much cable stringing and wiring.

Also distributed throughout the experimental areas at key locations are beam status lights that resemble traffic lights.



...Paul Czarapata (right) and Skip McGuire demonstrate the model door on which the infrared sensor was developed...

When a red light is on, a researcher knows the beam is enabled and absolutely no access to certain parts of the experimental area is allowed.

A yellow light means limited and carefully controlled access is permitted to an area when the beam is on, but limited in intensity. This mode is used when an experimenter needs to make adjustments to apparatus located adjacent to the beam line.

The green light means the beam is off and cannot be turned on until a full search and secure procedure has been completed.

The new system has been operating successfully since its implementation during the recent Meson pause. It soon will be expanded to include the primary beam areas near the Meson production targets.

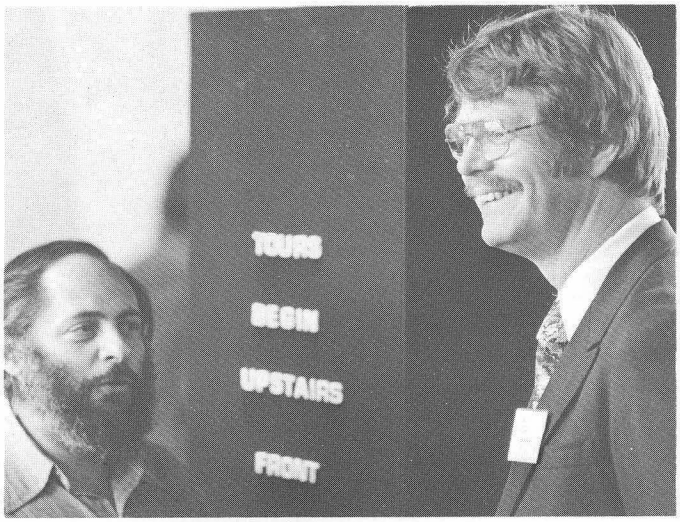
* * * * *

SPORTS ENTHUSIASTS WANTED

Fermilab's Recreation Department is organizing an intramural softball league and a ping pong tournament. Individuals who are interested in participating should contact Helen McCulloch, Ext. 3126, CL1-W.

* * * * *

The Latest issue of HEALTH SAFETY published by the Safety Section, has been included with this issue of Ferminews. Marilyn Kasules of the Safety Section is the editor of Health Safety.



...Norman Gelfand of Fermilab (left) and Tom Kirk...

ELECTROBIOLOGIST TELLS HOW IT'S DONE

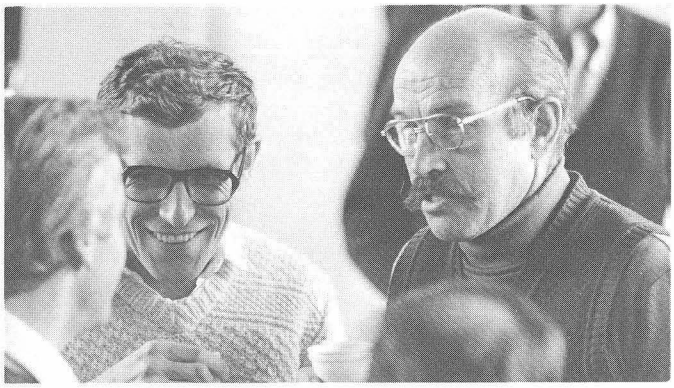
Dr. David H. Gelfand, a senior associate with Cetus Corporation, spent a good portion of his lecture telling his audience how to go about creating new life forms.

Speaking about "Applications of Molecular Genetics to Biological Engineering" at Wednesday's colloquium at Fermilab, he took his audience into the relatively new discipline of molecular genetics and recombinant DNA. He explained the chemistry of splitting complex molecules basic to life and then the techniques for putting the fragments back together into forms scientists were seeking.

Cetus Corporation was formed eight years ago for just this purpose--to develop biological processes for industry and to conduct biological research. Gelfand has been with Cetus for three years. He explained that it takes many years to develop suitable organisms for clients to use in various industrial processes. One project, for example, to develop an organism that can be used for protein in animal feed, is expected to take around 2 to 2½ years.

Gelfand also said the field has changed from the early days of excessive optimism and anticipated dramatic advances. Molecular biologists are finding the going difficult and time consuming, he said. Essentially, what is happening today is about "180 degrees from what people first speculated," he said.

* * * * *



...(L-R) Jim Walker, Fermilab, F. Eisele, Dortmund, Germany, and Lynn Stevenson, Lawrence Berkeley Laboratory...

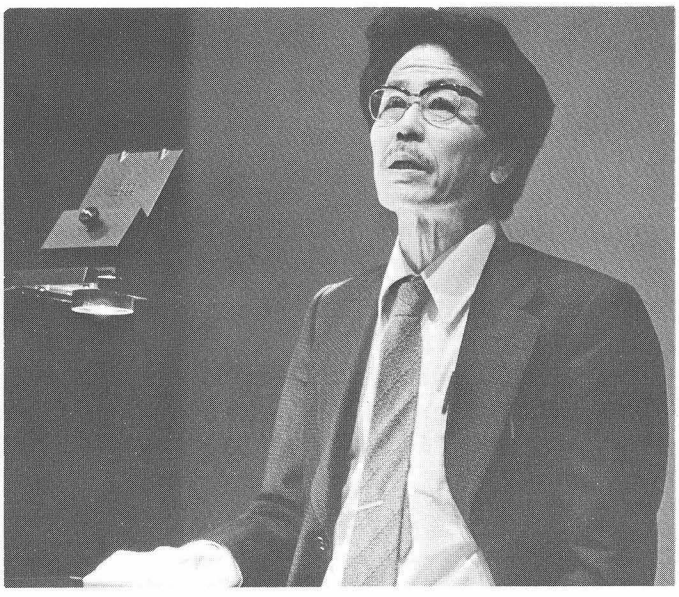
IDEAS FLOW IN MUON-NEUTRINO WORKSHOP

"It was a very successful workshop," said Tom Kirk, organizer of the four-day Muon-Neutrino Workshop. Currently he is on leave from his position as head of the Fermilab Neutrino Department.

Many ideas were exchanged, and that, after all, was the main purpose of the workshop, said Kirk. Held in the Central Laboratory auditorium, the workshop became the first public discussion of plans Fermilab scientific users and staff members have for the physics and facilities that will accompany the coming of 1,000 GeV energy levels.

More than 200 scientists attended, many journeying from Europe, Russia and Japan to discuss this coming era in physics.

* * * * *



...T. Kitagaki, Tohoku University, Japan, addresses workshop...

BONNE ANNEE 1980
from CHEZ LEON

Reservations now available.
Call Ext.3524

MENUS

TUESDAY, JANUARY 29 - 7 p.m.

Cheese Fondue
Fresh Green Salad
Chocolate Crepe Cake *$6.50*

WEDNESDAY, JANUARY 30 - 12:30 p.m.

Tomato Soup
Frito mixto de pesci
Salad
Almond Custard *$4.50*

THURSDAY, JANUARY 31 - 7 p.m.

Monk fish
w/whiskey sauce
Roast Duck citrus
w/grande manier sauce
Brussel Sprouts and
chestnuts
Wild rice
Fresh salad
Cream puffs
w/chocolate and
praline sauce *$8.00*

AEROBIC DANCING BEING OFFERED

Fermilab's Recreation Department is organizing a seven-week session in aerobic dancing.

It will be taught by an instructor with the Aurora Young Men's Christian Association. Scheduled to start the week of Feb. 4, the classes will be held at 16 Potawatomi in the Village.

Two options are available. The course can be given three times each week on Monday, Tuesday and Thursday for a cost of $25 an individual. Or it can be offered twice each week on Monday and Thursday for $20.

If a sufficient number of people show an interest, a demonstration class can be arranged to explain this form of exercise. Individuals should contact Helen McCulloch, Ext. 3126, CL1-W.

* * * * *

...Pearl Primus and Company...

PEARL PRIMUS AND COMPANY COMING TO FERMILAB

Pearl E. Primus, who has been hailed as one of this country's "most spectacular dancers," and her company will perform at Fermilab Feb. 9.

The performance, open to the public, will begin at 8:30 p.m. in the Central Laboratory auditorium. The group's appearance is part of the Fermilab art series. Each ticket costs $5. Seats are reserved. Reservations may be made by calling Ext. 3124.

A person who feels her art and becomes a part of it, Primus has said, "I dance not to entertain but to help people better understand each other... because through dance I have experienced the wordless joy of freedom, I seek it more fully now for my people and for all people everywhere." One writer said, "The research and dance of Pearl Primus have aided the American black person in developing a pride and a feeling of dignity in his ancestral roots."

Primus holds a Ph.D. degree in anthropology. Her educational background and research have given her performances an authenticity and depth that is unbelievable, said another writer. And Primus herself has said, "I didn't leap just for leaping's sake. I had something to say in movement at all times."

* * * * *

FERMINEWS is published weekly by the Public Information Office of the Fermi National Accelerator Laboratory — P.O. Box 500 — Batavia, Illinois 60510 — Phone: 312-840-3351. ☆ U.S. GOVERNMENT PRINTING OFFICE: 1980—651-139/32