April 17, 1992 Vol. 15, No. 7

Ferminews

FERMI NATIONAL ACCELERATOR LABORATORY

New leadership for Technical Support Section

Paul Mantsch leaves helm

Paul Mantsch has resigned his post as Head of the Technical Support Section effective April 1 to accept a new assignment as Project Manager for the SDC Calorimeter. Manstch has led the Technical Support Section for the past seven years. Director John Peoples, in his appointment letter, praised the accomplishments of the section under Mantsch's leadership. The Central Design group 17-m dipole effort started under the guidance of Mantsch and according to Peoples, "The Technical Support Section did a superb job of first designing the cryostat for the 17-m dipole and then for the 15-m SSC full-scale prototype dipole." The development of tooling for the cold masses and the fabrication of the cold masses of these magnets were high points of Technical Support's achievements during Mantsch's tenure. The low beta quadrupoles were also developed during this time. "Here I was pleased not only with the product but also the successful attempt to define formal requirements for the magnets. These magnets will be a major element in our search for the top," said Peoples. Mantsch joined the Fermilab staff in 1973 and has held several technical management positions at the Lab in addition to his participation in experiments. His new position with the SDC group will give Mantsch an opportunity to return to his "physics experimental roots."

Paul Mantsch

Ray Hanft will succeed Mantsch as Head of Technical Support until October when Frank Turkot, who is on a one-year assignment to work on the ZEUS detector at DESY, returns to the Lab. Hanft has held the position of acting Deputy Head of Technical Support since November 1991. The Director praised the contributions Hanft has made in improving the ES&H compliance posture of TS. "We need to do well on our DOE audits and our Tiger Team Assessment, not because these are bureaucratic hoops through which we must jump, but because they provide tangible recognition that we are taking the safety and health of our workers seriously and we are developing the appropriate sensitivity for our environment," said Peoples.

Under the reorganization, **Jim Strait** will serve as the new Deputy Head. As part of his duties, Strait will represent Technical Support as a member of ESHPAC. He will also continue to supervise the activities of the Magnet R&D group. According to John Peoples the group has done excellent work under Strait's direction. "I am confident that it will turn to its new added assignment of calorimetry with enthusiasm and skill," said Peoples.

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Ray Hanft

Jim Strait

Gale Pewitt

inside

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The deadline for the Friday, May 1 issue of *Ferminews* is Wednesday, April 22. Please send your article submissions or ideas to the Publications Office.

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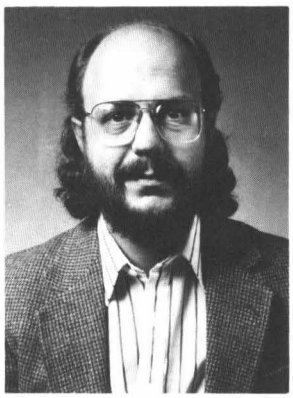
Lab adopts new QA program

Ten criteria provide framework for total management system



The new QA program is more "user friendly," said Mark Bodnarczuk, Manager of Quality Assurance and Conduct of Operations Office

On April 1, 1992 the Directorate signed a new quality assurance (QA) program which officially replaces the NQA-1 program under which the Laboratory has operated since 1985.

"It is the first time that we have had a QA program with guidance from the Department of Energy Office of Energy Research (ER) tailored to a research facility such as Fermilab," said **Mark Bodnarczuk**, Manager of the Quality Assurance and Conduct of Operations Office.

The new program is based upon ten criteria which are divided into three categories: management, performance and assessment. Under the management category are: Criterion 1, program; Criterion 2, personnel training and qualification; Criterion 3, quality improvement and Criterion 4, documents and records. Performance includes: Criterion 5, work processes; Criterion 6, design; Criterion 7, procurement and Criterion 8, inspection and acceptance testing. Assessment includes: Criterion 9, management assessment and Criterion 10, independent assessment. Using the ten criteria to categorize processes, activities and Department of Energy Orders, this new QA program is designed to serve as a total management system for achieving the Laboratory mission in the DOE Management and Operations contract.

Program offers structure for integrating DOE Orders

One of the most important and positive aspects of the new QA program is that the ten criteria give the Laboratory a structure for integrating into the everyday management system the over 140 DOE Orders under which we at Fermilab must operate. "By using the 10 criteria as functional categories, we can create an overview of what kind of requirements are in each Order," said Bodnarczuk. This overview is useful for three reasons: first, it prevents duplication of effort within the management system. Second, it establishes accountability and implementation responsibility for each Order. Lastly, it does not create another layer of paperwork.

The new quality assurance program represents an enormous effort on the part of Bodnarczuk, who has been administering the Fermilab QA Program since 1985. Under the old NQA-1 program, many employees did not see the applicability of the program to the mission and work at Fermilab. Taking that message to the Department of Energy, Bodnarczuk worked to get a new QA guidance approved and was the principal author of the new DOE ER QA guidance. The new program is more "user friendly" according to Bodnarczuk. "It is a program that fits our needs as a basic research laboratory."

The Fermilab Quality Assurance Program has now been transmitted to the DOE Office of Energy Research Director William Happer for approval. After approval, the guidance will be published as a DOE Standard which will be used by all ER sponsored non-reactor, non-weapons research facilities nationwide.

Implementation assistance available

Currently, all Fermilab divisions and sections are preparing their QA implementation plans. During the implementation period, Bodnarczuk has volunteered his services to help each division and section develop a specific quality implementation plan (SQIP). He also offers a two-hour course which defines the ten criteria and how they apply to current policy and procedures. This course has already been completed by all department heads in the Laboratory Services Section, members of the Technical Support Section and those who have recently completed the Fermilab Supervisory Development course. Complete implementation of the Fermilab Quality Assurance Program is scheduled for mid-October 1992.

Technical Support continued

Gale Pewitt was named Associate Head of Technical Support. In his new role, Pewitt will be Project Manager of the Main Injector activities at Technical Support. This will include the acquisition of the magnets and testing activities as well. Pewitt was recently honored by the Department of Energy for his leadership role in the successful design, production and test of 50-mm SSC dipole magnets. This project, which is now complete, was probably the largest technology transfer project in the Lab's history. It brought together the talents of individuals from Fermilab, the SSCL and General Dynamics Corporation.

AØ abort system ready for action

Almost two years ago, the Accelerator Division began a project designed to speed up the process of switching from fixed target mode to colliding beam operation. Part of the ultimate solution was to be found in transforming a portion of the accelerator into a giant "rollerblade."

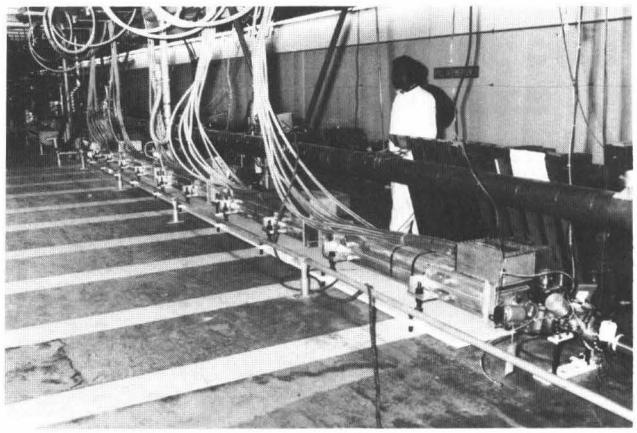
The configuration of the accelerator varies somewhat depending on the mode of operation. In fixed target mode, protons are extracted from the circular Tevatron at AØ through five Lambertson magnets and three skew dipoles, then sent downstream to the experimental areas. In colliding beam mode, two beam abort magnets and ten kickers replace the Lambertsons, providing a way to brake the countercirculating proton and antiproton beams.

Manually moving one system out and replacing it with the other was a time-consuming process. It would remain that way until engineer **Kay Weber** (AD) could devise a way to roll in one set of magnets while rolling out the other. In mid-1990, the AØ abort project began.

The project was broken up into two phases. The design Weber had in mind for installing phase one of the abort system emphasized simplicity. "AØ is a notoriously hot area," Weber said. "Technicians would have to go in, break the vacuum on the Lambertsons, and jack up the magnets." The maximum exposure limit in the tunnel is two hours, and a crew removing the extraction system piecemeal and installing the abort kickers and magnets in the same manner could easily reach this limit, forcing them to leave prematurely.

To complicate matters, the changeover between systems involved delicate excavation. When in place, the bulky Lambertsons sat in carved out troughs three inches below the tunnel's floor in some places. Before the kickers could be installed for the changeover to colliding beam physics in phase one, an epoxy filler had to be poured into the depressions to level the grade of the tunnel floor.

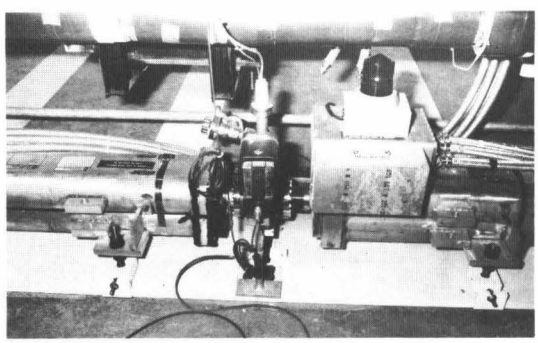
At the end of the fixed target run in January, **Mike Petkus** (AD) and **Frank Schneider** (AD) supervised removal of the fixed target components, and contractors using a hard epoxy filled the depressions these overstuffed magnets left in the tunnel floor. Next, the many abort and kicker components underwent consolidation. Under the direction of drafter **Joe O'Malley** (AD), the ten kickers and two abort dumps were strung together on interlocking steel plates, divided into three large sections and mounted on very large ball bearings. The entire abort system took on the appearance of a giant rollerblade, allowing it to be easily rolled into place. Technicians will later attach large bolts to the plates supporting the abort system, securing them to the floor six feet away. These remote mechanical control arms will enable them to disconnect the kickers and abort magnets from a safe distance by turning the screws and pulling the components toward the outside tunnel wall.



Cliff Foster (AD/ Mechanical Support) looks down the enclosure at AØ. The white lines on the floor are actually inlaid steel plates on which the abort system is rolled into place.

"We call it a push me-pull me," Weber explained. The motivation behind creating the mobile system was twofold: first, the push me-pull me increased the distance between worker and accelerator, safely increasing the exposure time; second, the push me-pull me decreased the amount of time necessary to break down components, consequently shortening fixed target to colliding beam changeover time.

Vital to the assembly work were the calculations performed by **Bruce Hanna** (AD) prior to fabricating the abort system. Residual radiation accumulated solely at the AØ abort magnets could impede accelerator performance, and energy accumulated in the abort magnets could damage accelerator components. The AØ abort system's potential effects on groundwater and magnet cooling water also had to be worked out to ensure environmental integrity as well as to maintain the safety of personnel who worked at or above the proposed AØ dump.

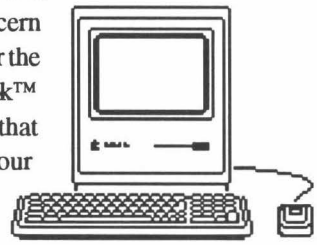


Key to the push me-pull me's are the steel plates which support the abort kickers. Ball bearings allow the assembly to slide.

In an ideal situation, the abort system's physical requirements could have been worked out with a high degree of precision. However, water in the soil and an uncertain concrete depth at AØ posed variables that made shielding requirements and magnet specifications difficult to estimate with

Continued on page 9

Dear Macintosh users:



Apple has discovered a potential safety concern with batteries used for the Macintosh®PowerBook™ 140/170 computers that we want to bring to your immediate attention. Spare (or stand-alone) batteries for these systems may be susceptible to damage because their contacts can potentially be short-circuited by a metal object making contact with both terminals. This situation can damage the battery and cause danger to customers.

To prevent any contacts from short-circuiting, we are adding a protective case to the Finished Goods spare NiCad battery for the PowerBook 140/170. This case, P/N 076-0590, will protect spare batteries from coming into contact with metal objects that might short-circuit the +/- terminals.

It is important that you upgrade your entire inventory of spare NiCad batteries immediately. All NiCad batteries for the PowerBook 140/170 sold under P/N 661-0721 or Finished Goods P/NM5545LLA must include these cases.

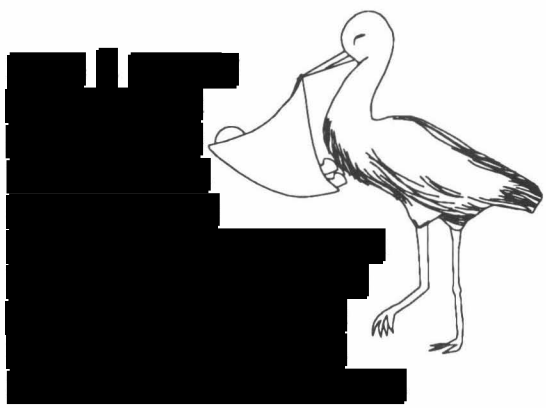
To receive your free battery cases, call 1-800-377-4127; the cases, which are available at no cost for 3 months, will be delivered directly to you. Please do not over-estimate your need, which might impact our ability to meet all of our customers' demands.

Included in this mailing is a temporary page for the *Module Identification Manual* that shows what the case looks like. Please file this page in you *Module Identification Manual*. In June we will update the technical information for the PowerBook 140/170 with this new battery information.

Because of the design of the PowerBook 100 sealed lead-acid battery, the potential for short circuiting this spare battery is more remote. However, to prevent any potential risk to customers, we will soon be providing a case for this battery also. To learn how to obtain a case for the PowerBook 100 battery, please check the Alert on the AppleLink® within the next few weeks.

Thank you for your assistance in resolving this potential safety concern.—*Apple Service, Apple Computer, Inc., 2025 Mariani Avenue, Cupertino, California 95014, 408-996-1010*

Congratulations to:

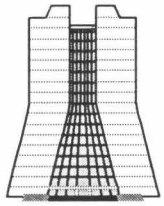


[redacted]

For your convenience

Ellen Simmons, Argonne Credit Union teller, demonstrates the ATM machine recently installed in the Wilson Hall atrium. Anyone who has a cash card from a bank in the CIRRUS network can access their account from the new machine. Ellen and her colleagues will be happy to tell you how to apply for an ACU cash station ATM card for your banking convenience.

Wilson Hall construction update



Construction began last week on a Wilson Hall renovation that will add 6,000 square feet of new office and conference space to the central laboratory facility. The Phase I construction contract was awarded to Oliver Structures of Aurora and a notice to proceed was issued Monday, April 6.

During the first phase of the project, Oliver Structures will pour a concrete deck over the west half of the project area. This work will necessitate the following changes effective Monday, April 13 until further notice:

- **Elevator service**: The west bank elevator will not serve the ground floor during this initial construction phase estimated to last approximately 10-12 weeks. The east bank elevators will continue to serve the ground floor.
- **Parking**: Parking along the west side of Wilson Hall is reduced. Additional parking is available at the Pine Street overflow parking lot located west of Wilson Hall and south of Pine street. A bark path through the woods provides easy access to Wilson Hall and the Linear Accelerator building.
- **Building access**: The west ground floor entrance will gain you entrance to the Mailroom, Stockroom and Visual Media Services only. It will not give you access to the elevators, west stairway or other areas of Wilson Hall. For entrance to Wilson Hall, you must enter through the north main entrance; the south auditorium doors or the east ground level entrance.
- **Mail**: All mail chutes in the Wilson Hall west tower will be sealed during phase I.

The handicapped parking area and entrance on the east side of Wilson Hall is not affected by these changes. As the project proceeds to the east side during phase II of the project, handicapped parking will be moved to the west side of Wilson Hall. The building will remain fully handicapped accessible throughout the project. Facility Engineering Services Section (FESS) is making it a top priority to insure that the safety and health of those visiting or working in Wilson Hall are protected and that special needs employees are accommodated throughout this project. FESS will hold weekly, open meetings every Tuesday in the Snakepit to provide status updates on changes in building access and planned utility interruptions.

Benefit notes

New group insurance program

During the week of April 6 you should have received a letter describing a new employee benefit which can provide coverage to you, your spouse, your parents and your spouse's parents. The new benefit is called Long Term Care Insurance.

Long Term Care Insurance pays for nursing home care, adult day care and home care. The type of care covered by Long Term Care Insurance is often referred to as custodial (personal) care, which is not covered by your medical insurance plan or Medicare.

If you are interested in Long Term Care Insurance, please sign the letter and return it to the Benefits Office, MS 124 by April 30, 1992. This does not obligate you in any way. If there is enough interest from employees, the Benefits Office will pursue further.

If you did not receive the letter, please call the Benefits Office at x3395, 4362 or 4362 for a copy.

Long term disability plan

The long term disability plan's monthly maximum benefit increased from $5,500 to $10,000 effective February 1, 1992. Your share of the premium continues to be 1/3 of 1% of your basic monthly salary. However, the monthly payroll deduction increased for those employees who were at the maximum deduction of $30.53. This change impacts only a few employees who were notified of the change.

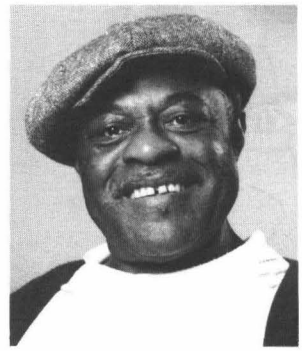
Final reminder

Stockrooms to close for inventory

Wilson Hall Stockroom: Closed today, Friday, April 17, at noon. Open Monday, April 20, at 12:30 p.m.

Site 38 Stockroom: Closed Monday, April 20, and Tuesday, April 21, all day both days.

A special thanks



I would like to thank everyone for their kind wishes and prayers in my behalf during the time I was on sick leave from mid-November through the end of March. I have now returned to work full time. Thank you—*Mack Hankerson*

Blood Drive

The Heartland Blood Center blood drive will be held on Thursday, April 23rd, from 9:00 a.m. to 2:00 p.m. in the Wilson Hall 1 West conference room.

Blood pressure monitoring

The Medical Department will offer a blood pressure monitoring on Tuesday, April 21 from 11:30 a.m. until 1:00 pm. in the Wilson Hall Cafeteria in front of the public speech bulletin board. All employees are welcome to participate. For further information, you may contact Mae Strobel, Medical Department, x3232.

Carpal tunnel syndrome

Preventing repetitive motion problems

Your wrist aches, your fingers feel numb, you have difficulty doing even the the most simple tasks like opening a juice jar. What's going on? It may be that you suffer from carpal tunnel syndrome—a hand disorder resulting from repetitious, forceful motion of the hands and wrists. Carpal tunnel syndrome is common and affects those of us who use the same hand motions over and over again at work or at home—painters, textile workers, word processors, cashiers, electronics assemblers and many others. Fortunately, you don't need to "grin and bear it." Carpal tunnel syndrome is often preventable through proper hand positioning and hand exercises.

Why your hand hurts

The carpal tunnel is the bony cavity in your wrist through which your nerves and tendons extend to the hand. When you repeat the same hand and wrist movements day in and day out, the excess strain causes tendons to swell and press on the main nerve of the hand. This persistent irritation of the nerve can result in pain, numbness and dysfunction not only in the hands and wrists, but may also extend up to the forearm and elbow as well.

What you can do about it

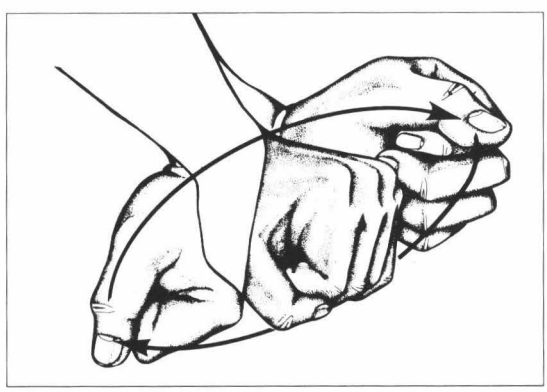
If you are at risk for developing carpal tunnel syndrome, why not prevent the condition before it occurs? By learning how to position your hands properly and by exercising your hands regularly, you can relieve excess pressure on your tendons and nerves and prevent unnecessary pain and disability.

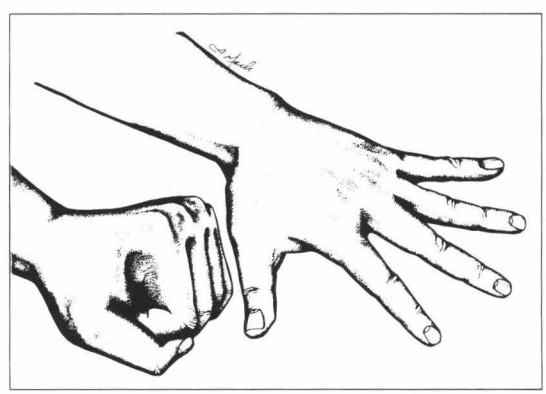
Hand positioning

When you keep your wrists and elbow straight, you place less pressure on the tendons and nerves in your hands. Try adjusting your work so that you can keep your forearm and hand straight. Use hand tools with the appropriate width, size and shape—that is, make sure that you can grip the tool comfortably, that the tool can absorb vibration and that handles are positioned to keep your wrists and hands in alignment.

Hand exercises

The following exercises, when done daily, can help strengthen wrist and hand muscles and can help relieve strain caused by tasks requiring repetitive motions. —*Parlay International*





Wrist rotation

Make a fist and rotate your entire hand (from the wrist) in one direction. Repeat 15 times. Switch directions and repeat 15 times. Then, release your hands, and with fingers extended, do the same rotations.

Hand stretch

Make a fist, then extend your fingers as far apart as possible. Hold for about 10 seconds. Relax. Repeat the entire sequence 5-10 times until hands and fingers feel relaxed.

tiger team REPORT

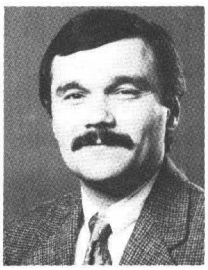
April 17, 1992 Vol. 1, No. 4

Tiger Team leaders visit Lab

The leaders of the Department of Energy (DOE) Tiger Team were at Fermilab last week to conduct a Tiger Team coordination meeting and pre-assessment briefing. Such visits are normally held a few weeks prior to the actual arrival of the Tiger Team and assist the Tigers in gathering the information necessary to prepare their assessment plan and make the final selection of the team members.

During the April 7-9 visit the the Tiger Team leaders, members of Fermilab management and DOE Area/Operations Office staff had an opportunity to get acquainted and discuss logistics for the upcoming assessment. Site tours, briefings with Fermilab and DOE personnel and the presentation of requested documents helped the Tigers become familiar with the Laboratory.

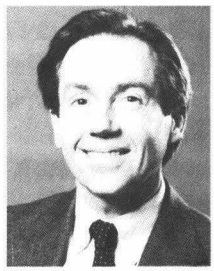
Meet the Tigers



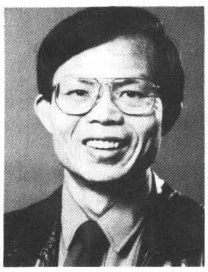
Harry Season

Tim Pflaum

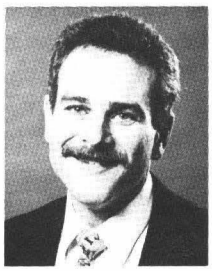
Bal Mahajan



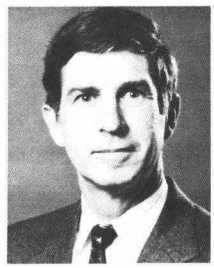
Tom Kevern



Sam Huang



Richard Green

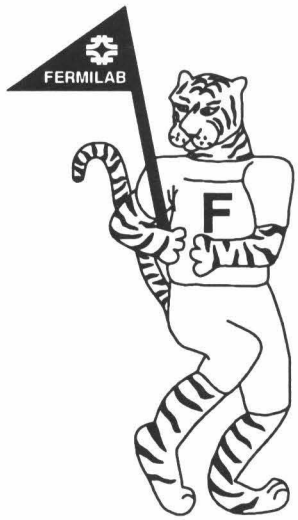


Gary Palmer

Justine Alchowiak

For the last several months we have been hearing that the Tigers are coming! Well last week a few of them arrived for a brief visit and *Ferminew* had the opportunity to interview them and learn a little about their backgrounds, past Tiger Team experience and thoughts about the assessment process.

Harry Season is the leader of the Tiger Team which will assess Fermilab. He is the Director of DOE Weapon Programs Division, Albuquerque, New Mexico Field Office. He has worked in this area of DOE for over 14 years. Season has a BS in electrical engineering and an MBA. This is his first time to serve on a DOE Tiger Team and he has a very positive attitude toward the program. "This process provides an opportunity for the Department to assess a facility's status of compliance and degree of commitment toward environment, health and safety regulations. Through these evaluations the Department and labs can



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team schedule

- May 11: Tiger Team Assessment begins
- June 8: Tiger Team Assessment Final Closeout

Can this be returned?

In preparation for the upcoming Tiger Team Assessment, many people are doing a "spring clean-up" of their respective areas. A question that has frequently come up concerns the return of items to the Fermilab Stockrooms.

Stockroom management has issued the following guidelines to help in the disposition of stock items that may be in your areas. If, during your cleanup, you find an item that fits **all** of the following criteria, it can be sent to the Site 38 Stockroom.

- It is a stock item.
- It is brand new.
- It is not hazardous.
- It has no shelf life.
- It is not radioactive.

If the returned material cannot be used, the Stockroom will dispose of it in accordance with applicable regulations. No credit will be issued for returned stock items, but the material will be used if possible. —*Frank Cesarano*

establish a baseline and find out the cause of any problems, if any problems exist...," said Seasons. "It is a valuable, procedural process.

Tim Pflaum is the deputy leader of the Tiger Team. He has an MS in systems management and works for the Department of Energy Defense Department in Washington, D.C. Pflaum has coordinated the corrective action plans for the Defense Programs' Tiger Team Assessments. He is currently working on the corrective action plan for Los Alamos National Laboratory. Having worked on 12 corrective action plans, he has had an opportunity to closely view the process. "A Tiger Team Assessment is an interactive process. It helps line management reach conclusions about what is important and what needs to do done," said Pflaum. "It works in conjunction with the self-assessment. The purpose is to helps facilities focus on where the problems are. It establishes a baseline and helps a facility formulate a corrective action plan."

Bal Mahajan is the Safety and Health subteam leader. He has a Ph.D. in mechanical engineering and has worked for three years as the Technical Safety Team leader for the DOE Environment and Health Office in Germantown, Maryland. Prior to his current position with the Department, he worked for the National Bureau of Standards. Mahajan has conducted eight DOE Technical Safety Assessments (TSA). This is the fifth time he has served as a member of a Tiger Team.

Tom Kevern was the only team member present at the pre-assessment. He will serve on the Safety and Health subteam. "There is a lot of advance work that must be done by the Safety subteam," said Kevern. A nuclear engineer, Kevern is employed by Program Management, Inc. located in Germantown, Maryland. This is the second time he has participated in a DOE Tiger Team Assessment.

Andrea Heintzelman is the Environmental subteam leader. She made a previous visit to the Lab and was not present during the pre-assessment visit. Heintzelman works for the Department of Energy Office of Environmental Audit in Washington, D.C.

Sam Huang and **Richard Green** are both serving as deputy environmental subteam leaders and are also associated with the DOE Office of Environmental Audit. Green has been on staff with the Department for 18 years and has a BS in entomology. Huang joined the DOE two months ago and has a Ph.D in environmental engineering. This is the first time Huang has served on a Tiger Team.

Gary Palmer is the Management subteam leader. For the last eight years he has been the DOE Director of Policy and Planning for Defense Programs in Washington, D.C. He has an MS in management and nuclear engineering. According to Palmer his group is responsible for bringing the results of the other two assessments together. "It is like the Grand Unifying Theory," said Palmer. "We find individual particles (problems) and then find causal factors (root causes)." Palmer also commented on the makeup of the Tiger Team leadership, "Tiger Teams bring together people from different disciplines."

Justine Alchowiak is with the DOE Office of Special Projects in the ES&H Office, Washington, D.C. She will coordinate the activities between the Tiger Team members, the Department of Energy and the Field/Area Offices during the assessment and the formulation of the action plan. She has 20 years experience in the environmental field and has a BS in chemistry and an MBA.

It's arrived!

Copies of *Tiger Teams at Fermilab*, an ES&H resource book, have arrived and are being distributed to all employees by the division and section offices.

The booklet explains the purpose and scope of the Tiger Team Assessment; defines key concepts, terms and processes; provides preparatory checklists and directories of responsibility for ES&H and management related issues.

When you receive the book, **please read it carefully** and discuss any questions that you may have with your supervisor or division/section safety officer. If you have not received a copy of *Tiger Teams at Fermilab*, please notify your supervisor.

Any division/section requiring additional copies of the publication should contact the Publications Office, x3278, WH6NW, MS 107, FNAL::TECHPUBS. Due to the demand for this publication, all extra copies recieved by division/section offices should be returned to the Publications Office for redistribution.

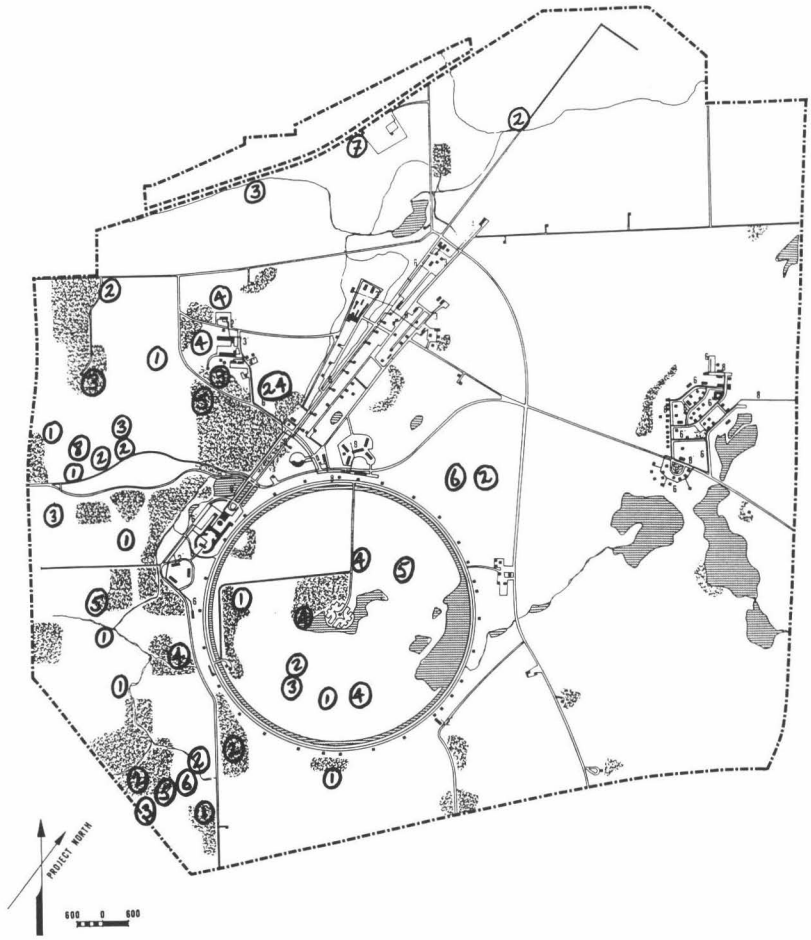
Oh, deer!

The March 22 snow fall was not received well by most of us who were already longing for spring, but it did provided an opportunity the following day for **Rod Walton**, head of the Parknet Environmental Research Program at Fermilab, to conduct a site-wide deer survey. According to **Rudy Dorner**, BS/Emergency Services, the snow was important because "you have to have a ground cover of snow to be able to see the deer."

The aerial survey began around 1:15 p.m. and it took approximately one hour and 45 minutes to cover all areas of the site. Walton was accompanied on the count by Marty Jone who runs the Urban Deer Project for the Illinois Department of Conservation.

"We counted 144 deer, all of which appeared very healthy," said Walton. The ideal range for deer density is about 15-25 deer per square mile. Although the overall mean density of deer at Fermilab is within this range, Walton pointed out that of the 144 animals, 130 were concentrated within an area of the site bounded by Wilson Rd., Eola Rd., and the southwestern boundaries of the Lab. This area is roughly four square miles, so the density in this area is between 30 and 35 deer per square mile. "The damage to the vegetation in that vicinity confirms that deer are very dense in that area," said Walton.

The other important factor in the deer survey is the reported number of deer represents a lower limit. "Although there was some snow remaining on the ground, it was melting fast by the time we began the survey, and the cover was probably only around 50% by the end of the survey," said Walton. "The deer are extremely difficult to see against bare ground, so undoubtedly, some animals were missed."



The aerial map above shows the areas on the Fermilab site in which deer were seen and the number counted in each area. The area of greatest density shows 24 deer.

AØ continued

any precision. To get a feel for what to expect in an abort situation, Hanna decidedly overestimated the load the abort system would have to bear when in use and aproached the design in a worst-case frame of mind. "We always try to be conservative,' Hanna said.

By the time he had finished, Hanna's drawings and equations filled two folders. They determined that the safest way to abort beam was to use a combination of the existing abort at CØ along with a new and improved abort at AØ. The abort at CØ would regularly handle protons from the Main Ring while the AØ abort would handle protons and antiprotons in the Tevatron on a less frequent basis.

This combination of two abort dumps can disperse stored energy most evenly, ensuring that no one area becomes too hot. Hanna's calculations led to the design of the water-cooled, graphite/aluminum/steel abort dumps now riding the push me-pull me's.

Following the collider run, AØ's abort system is ready to roll — out, that is. Phase two of the project will involve putting the extraction system onto skates attached to push me-pull me's. Upon completion, the tunnel setup at AØ will resemble a railroad switchyard. When the aborts are pulled out of place toward the outside of the tunnel wall, the Lambertsons will be pushed into place from the inside. And when the aborts need to be rolled into place for colliding beam physics, the Lambertsons will be pulled out.

Minimization continues to be the operative word on this project; minimization of effects on people and machinery. Electrical engineer **John Dinkel** (AD), who maintains the kickers, sees a parallel between the abort dump and the downhill ramps used by runaway trucks on mountain roads. "When you're going downhill and you've lost your brakes, you don't want to see a sign that says 'Road Closed.'"—*Brian Charles*

How they got hurt

The leading causes of on the job injuries

Machine Accidents

In previous issues of *Ferminews*, we presented the first two leading causes of on the job injuries—impact accidents and falls. The last of the major causes of on the job injury is machine-related accidents—getting caught by moving machine parts.

When working around any machine that rotates, slides, or presses, use extreme caution—never wear jewelry or loose-fitting clothing that could get caught in your machine. Always use safety guards, shields, and appropriate lock-out procedures. And, never work on a machine unless you are specifically trained to do so.

Be Safe, Not Sorry

The nature of accidents is that they can happen anywhere at any time. But, by using safety sense, you can eliminate the overwhelming majority of worksite injuries. Be alert to the hazards you face each day and learn what you can do to protect yourself against accidental injury and disability. —*Parlay International*

NALREC News

Upcoming events.

Cookout Social Hour: Spring is coming and we'll be outdoors to enjoy it on May 1. A DJ will be there for your entertainment. Watch *Ferminews* for details and plan to attend.

White water rafting: There are two trips now! June 13-14 and July 18-19 are the dates set for the 2 two-day rafting trips at Wolf River, Wisconsin. Check your calendar and plan to go on one of these exciting trips. Just $90 for one night Motel/Lounge, bus ride, plus snacks to and from, total of 10/12 hours rafting and $10 for Indian Reservation gambling. See Dominick x3187 with a $50 deposit to secure a seat. The trips are booking fast.

Attention all baseball fans: We will be going to see the Kane County Cougars in 1992. Fermilab Day will be Saturday, June 13 at 7 p.m. Cost is only $3.50 and of course there will be door prizes. It's a Saturday night; mark your calendars.

NALREC noon-hour cafeteria sale coming at the end of April.

Coming soon: a horseback riding trip and White Sox games in Milwaukee and Detroit. More information later. . . —*Charlotte Smith*

Harper's index

Average combined SAT score for children in families whose annual income is more than $70,000: 997.

Average combined SAT score for children in families whose annual income is less than $10,000: 768.

Quality corner

The Quality Assurance and Conduct of Operations Office would like to receive suggestions from employees or users on how to improve the quality, efficiency, reliability or effectiveness of Laboratory services or operations. Please send your suggestions to Mark Bodnarczuk, MS 200 or FNAL::Bodnarczuk.

Classifieds ads

Automobiles

1986 Mercury Grand Marquis LS. 2 door, loaded, clean, good condition. $4,500 o.b.o. Call E. Hall at x3276 or 365-6663 evenings and weekends.

1984 Nissan Sentra XE wagon. Auto., AC, 95K, red 4 door. New battery, runs well. $1,450 o.b.o. Call Junye at x4511 or ALMOND::JWANG or 708 406-8408 after 5 p.m.

Miscellaneous

Nintendo Gameboy with battery pack and carrying case. Includes 12 games. $185 o.b.o. Call John Juneau at x3366 or 815 286-7244 after 5 p.m.

ShopSmith Mark V Power Tool Unit. Comes with lathe, table saw, drill press, sanding disk and grinding wheel. Manuals included. $700 o.b.o. Call Jack at x4060 or FNDCD::SCHMIDT.

Queen size waterbed, wave control mattress. Used for 1 year (like new). Wooden frame with four drawers under bed (two on each side of bed) padded rails and heater pad. Two sets of water bed sheets and mattress pads included. Asking price $350 o.b.o. Call Suzanne at x2401.

Fujica STX-IN 35mm camera, with two lenses. 1:1.9 FSO, 1:2.8 F28, flash, bag. Total $100. Call Junye at x4511 or ALMOND::JWANG or 708 406-8408 after 5 p.m.

Full-size bed complete. $100 o.b.o. Call Bill at x3981 or Pat at x3521.

0.45 carat Marquis cut diamond ring with accompanying gold ring. Appraised at $1,600. Will sell for $850 or reasonable offer. Call Mike at x 4860.

Horses, 18-year-old Appaloosa mare, 8-year-old Pony-of-America. Both western or English. Can be seen on site. $600 each. Call Roy at x3144 or 708-665-8246 evenings.

Mailing label

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