Procedures for Experimenters

As an experimenter at Fermilab, you have come to work at the largest, most active research laboratory for high-energy physics in the United States. Since its founding in 1976, Fermilab's mission has remained unchanged—to provide unequaled resources for talented people from around the world as they seek to understand the fundamental particles and forces of the universe.

PFX

This manual has been prepared to give you information about Fermilab and about your obligations and responsibilities. It is not a contract of employment. Fermilab reserves the right, in its sole discretion, to interpret policies on a case-by-case basis and to change policies and procedures at any time.

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Operated by Universities Research Association, Inc.
under contract with the United States Departmant of Energy.

A Letter from the Director

Physics experimenters at Fermilab have the best opportunities on earth for research at the frontiers of high-energy physics. The Fermilab scientific program is addressing all of the central questions of our time with experiments that are the best, or among the best, in the world. Just as we are dedicated to doing the best science, we are also committed to doing the safest science.

Science and safety are not at odds. The highest standards for building and operating a science laboratory mean building and operating it safely. Our challenge is to take the same intelligence and energy and spirit that we apply to physics experiments at Fermilab and use it to integrate safety into everything we do.

As Fermilab's director, I have no greater responsibility than the safety of all those who work at Fermilab–employees, contractor and users. Every Fermilab user needs to understand clearly that there is no project so important, no schedule so critical, and no task so vital that it is worth risking anyone's safety to accomplish. Perhaps more than any other field, high-energy physics depends on collaboration. We owe it to each other, and we depend upon each other, to make Fermilab a safe place to work together.

FERMILAB

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Introducing Fermilab

CHAPTER 1

Physics at Fermilab

Fermilab's mission is to advance the understanding of the fundamental nature of matter and energy by providing leadership and resources for qualified researchers to conduct basic research at the frontiers of high energy physics and related disciplines. Universities Research Association, Inc., (URA), a consortium of 87 research universities throughout North America, Japan and Europe, operates Fermilab for the U.S. Department of Energy (DOE).

Collaborators working at Fermilab from more than a hundred universities and laboratories across the country and from dozens of foreign institutions carry out experiments at the forefront of high-energy physics. A new experiment begins with a proposal from a group of experimenters to the laboratory director. The director considers experiment proposals with the help and advice of the Physics Advisory Committee, a panel of distinguished physicists mostly from outside institutions. For accepted proposals, the laboratory provides some of the resources. These resources can include particle beams, advanced high-resolution detectors, computation and networking, and engineering and technical support.

An important channel for experimenters' input to Fermilab is the Fermilab Users' Organization. Members of the Fermilab Users' Organization hold yearly elections for the Users' Executive Committee, whose members meet periodically with the director and laboratory staff to maintain close contact with planning, programs and operations, and advise on candidates for membership on advisory committees.

Collaborators from more than a hundred universities and laboratories across the country and around the world carry out experiments at the forefront of high energy physics.

A series of particle accelerators culminates in the Tevatron, the world's most powerful, particle accelerator. The new Main Injector, the replacement for the original Main Ring accelerator, injects protons and antiprotons into the Tevatron. The two accelerators, the Tevatron and the Main Injector, provide beam for experiments in two ways. In the fixed-target mode, protons from the Main Injector are accelerated to 120 GeV, then extracted and transported to the fixed-target experimental areas. In the second mode, the collider mode, the Tevatron accepts and accelerates protons and antiprotons to 1 TeV and brings the counter-rotating beams into collision. To exploit the resulting center-of-mass energy, two large collider detectors, CDF and DZero, operate at two sites around the Tevatron ring. With the Main Injector in operation, it is possible to operate simultaneously with 120 GeV fixed-target beams and collider experiments.

Fermilab Milestones 1965 - 1999

June 21, 1965
Under contract from the U.S. Atomic Energy Commission (AEC), Universities Research Associates (URA) incorporates to build and operate a new national accelerator laboratory.

December 16, 1966
The AEC chooses a site 30 miles west of Chicago.

March 1, 1967
URA appoints Robert Wilson Fermilab's first director.

June 15, 1967
Operations begin at Oak Brook, Illinois.

November 21, 1967
President Lyndon Johnson signs bill authorizing the National Accelerator Laboratory

December 1, 1968
Groundbreaking for Linac.

October 3, 1969
Groundbreaking for Main Ring.

March 1, 1972
First 200 GeV proton beam passes through Main Ring.

December 14, 1972
Main Ring energy doubled to 400 GeV.

May 11, 1974
NAL renamed "Fermi National Accelerator Laboratory."

May-June 1977
Fermilab experiementers announce discovery of bottom quark.

October 19, 1978
Leon Lederman appointed director.

August 16, 1983
Groundbreaking for Antiproton Source.

February 16, 1984
Acceleration of Tevatron beam to 800 GeV.

October 13, 1985
First observation of proton-antiproton collisions by CDF collider detector at 1.6 TeV center-of-mass energy.

October 21, 1986
Acceleration of Tevatron beam to 900 GeV.

November 30, 1986
First proton-antiproton collisions at 1.8 TeV.

April 20, 1989
John Peoples appointed director.

February 14, 1992
DZero collider detector commissioned.

September 25, 1992
Dedication of Lederman Science Education Center.

March 22, 1993
Groundbreaking for Main Injector accelerator.

September 4, 1993
New 400 MeV Linac commissioned.

April 26, 1994
Announcement of first direct evidence for top quark.

February 2, 1995
Tevatron sets new world record for number of high-energy proton-antiproton particle collisions.

March 3, 1995
Fermilab experimenters announce discovery of top quark.

August 5, 1997
Fermilab extracted a record intensity 800 GeV beam for fixed target experiments—2.86E13.

March 1998
Discovery of B_c Meson.

February 24, 1999
Observation of direct CP violation, in neutral Kaons.

The director considers experiment proposals with the help and advice of the Physics Advisory Committee.

The People of Fermilab

Successful particle physics experiments need more than experimenters and fast-moving particles. They take planning, consulting, financing, detection, computing, engineering, construction, bookkeeping, communication, and consideration of safety and effects on the environment. They use the skills and experience of physicists, engineers, technical specialists, administrators and the people who provide the services they need: purchasing, buildings, hiring, transportation, safety, information, meals, housing, child care, and recreation. The employees of Fermilab work in myriad capacities to create an outstanding laboratory for high-energy physics research. Each person who works at Fermilab brings a unique combination of skills and experience and spirit to the job. Every experimenter should recognize the human rights principle of Fermilab as the standard for the way we work together.

The Laboratory and the Environment

Fermilab's 6,800 acres contain the Tevatron, Main Injector, detectors and 350 buildings, including laboratories, shops, assembly bays, administrative offices, a medical office, a cafeteria, warehouses, recreational facilities and housing for experimenters.

Wilson Hall ("The High Rise") reaches into the sky above 6,800 acres of Illinois that hold—besides the country's busiest high-energy physics lab—lakes and ponds, upland forests, fields of corn and soybeans, oak savannas and reconstructed native tallgrass prairie.

At Fermilab, we have a strong commitment to stewardship of the land. From a 10-acre beginning in 1975, in partnership with the Nature Conservancy and hundreds of volunteers, we have reconstructed more than 1000 acres of our site to a native grassland that approximates the pre-settlement condition, creating one of the largest tallgrass prairies in the world. Wild ducks and geese far outnumber physicists at Fermilab; and, the Laboratory maintains a large herd of American bison adjacent to the Industrial Area.

Fermilab experimenters need to recognize and help implement the Environmental Policy of DOE, with its goals for the entire Fermilab community.

Human Rights at Fermilab

"The policy at the Fermi National Accelerator Laboratory is to pursue its scientific goals with an emphasis on equal employment opportunity and a special dedication to human rights and dignity.

"Fermilab attracts scientists, not only from this country, but from many other nations all over the world. Foreign visitors, laypersons, as well as scientists, come to the laboratory to participate in its work. They represent a wide variety of races, nationalities, cultures and beliefs. It is essential that we provide an environment and maintain an atmosphere in which both staff and visitors can live and work with pride and dignity without regard to such differences as race, religion, sex, or national origin.

"In any conflict between technical expediency and human rights we will stand on the side of human rights. This is because of our dedication to science. The support of human rights in our laboratory and its environs is inextricably intertwined with our goal of making the laboratory a center of technical and scientific excellence. The latter is not likely to be achieved without success of the former."

From Robert Wilson's original policy statement on human rights at Fermilab.

Environmental Policy

Fermi National Accelerator Laboratory conducts scientific research with regard for the protection of the community and the environment. We believe that high standards of environmental practice are fully compatible with our search for an understanding of the fundamental properties of nature, and we are committed to the incorporation of environmental protection practices in the daily conduct of experimental physics.

To advance the goals of restoring and enhancing environmental quality, Fermilab's policy is to

- Educate experimenters and employees at all levels to protect the environment by preventing pollution, minimizing waste and by the consistent choice of the least toxic means to achieve experimental goals.
- Encourage initiatives in establishing sound pollution prevention and waste reduction practices.
- Take measures to minimize contaminants and wastes through source reduction and recycling.
- Evaluate the environmental impact of actions and take all necessary measures to mitigate their effects.
- Strengthen self-assessment programs and act swiftly to correct deficiencies.

Fermilab makes its land resources available to qualified investigators to conduct ecological research. These environmental research projects advance our understanding of the dynamic relationship between nature and human activities.

Fermilab's policy of careful land management and stewardship serves as an example of how high-energy physics and a healthy environment can co-exist.

"...I was the lone employee, wondering who, if anyone, would come to help me turn that cornfield into a physics laboratory."

—Robert Wilson, on his first months as Fermilab director, in 1967.

How We're Organized

Operating under a directorate, Fermilab has four divisions and four sections. The Beams Division (BD) designs, constructs and operates the machines that provide high-energy protons and antiprotons as well as the beamlines that transport beam to fixed- target experiments.

The Particle Physics Division (PPD) takes responsibility for mounting high-energy physics experiments and supports Fermilab staff scientists in their physics research.

The Computing Division (CD) operates and maintains most of the laboratory's computers and computer networks and provides much of the hardware and software used for data acquisition, offline analysis and general computing at Fermilab.

The Technical Division (TD) manages the machine shops and much of the laboratory's mechanical engineering support. The TD designs and builds accelerator and analysis magnets, both superconducting and conventional and carries out research on advanced magnet technology.

The Business Services Section (BSS) manages mail, procurement, stockrooms, warehousing, shipping, receiving, payroll, accounting and the Legal Office.

The Facilities Engineering Services Section (FESS) coordinates construction and facility operations and maintenance, as well as civil engineering, architectural design and major construction inspection.

The Laboratory Services Section (LSS) administers Fermilab's personnel function and manages the Library, the Users' Office, the Users' Center, the Benefits Office, the Medical Office, publications, housing, the cafeteria and child care, as well as the Education Office.

The Environment, Safety and Health Section (ES&H) monitors Fermilab's environment, safety and health programs, manages site security, telecommunications, the Fermi Fire Department, conducts independent reviews and serves as the ES&H reporting channel to DOE.

The Fermilab Directorate oversees all these organizational units and directly supervises program planning, the budget, internal audit, technology transfer and the Office of Public Affairs.

Since organizational changes are not unusual at Fermilab, we suggest that if you need more details about these organizations, ask at the Users' Office, the division or section office, or check the Internet; for example, http://www.fnal.gov/faw/fermilab_at_work.html

What Every Experimenter Must Know

People come to work on physics experiments at Fermilab from different institutions all over the world. Each institution has its own way of doing things. Here at Fermilab, we too have found our own ways to work together safely and effectively—with respect for others, for resources and for the environment.

Over the years, Fermilab has developed an integrated set of policies and procedures, compatible with federal and state regulations and laws, that guide the way we do business. While you are an experimenter at Fermilab, you must learn and follow the policies and procedures we've established. We have collected in this chapter the key policies and procedures that every user must know. When you register, you will be asked to sign a statement that you have read this chapter and agree to comply with its provisions.

ES&H Policies

Good environment, safety and health (ES&H) policies have always been fundamental to Fermilab. The Fermilab ES&H Manual (FESHM) describes Fermilab's ES&H program. The Fermilab Radiological Control Manual, part of the FESHM, describes Fermilab's radiation safety program. Reference copies of both these documents are available in the ES&H Section, all division and section offices, and on the Internet, http://www-esh.fnal.gov:8001/FESHM/ or http://www-esh.fnal.gov:8001/FRCM/

Working Safely at Fermilab

All Fermilab employees and users are responsible for protecting themselves and the environment. This fundamental principle is essential for our work today, for our future and for the future of Fermilab. Each user

CHAPTER 2

In an Emergency

In any emergency, dial 3131 from any laboratory telephone. From a non-laboratory telephone, dial 840-3131.

When the operator answers, give your name, your location and the nature of the emergency. Stay on the phone until the operator has all the necessary information and tells you to hang up. The operator will activate the emergency response. The Laboratory has appointed and trained an Emergency Coordinator who has the responsibility and full authority for directing an emergency response.

Emergency Response

Fermilab has staff and equipment to handle a variety of emergencies. Anyone with serious medical problems is taken immediately to a community hospital that has agreed to provide emergency care for people injured at Fermilab. For emergency medical aid, dial 3131.

The inside front cover of this handbook explains the meaning of alarms and warning signals at Fermilab. Please take a few minutes to learn what each one means, and how to respond.

is accountable to the head of the experiment's host division—either the Beams or the Particle Physics Division—for the safe design and operation of experimental apparatus. The division head is responsible for the safety of all activities in the division. The laboratory director is ultimately responsible for safety at Fermilab. If you do not follow Fermilab's ES&H policies, you may be denied use of Fermilab facilities.

Most Fermilab divisions and sections have their own ES&H staff to provide technical support. Those that don't have their own ES&H staff have access to ES&H staff in the ES&H Section. The division staff may include a senior safety officer (SSO), a radiation safety officer (RSO), and an environmental protection officer (EPO). Each division and section also has a liaison within the Fermilab ES&H Section. This liaison provides support to the division or section if it is needed. You should find out who are your host division or section ES&H staff and make sure to ask them about your ES&H concerns.

The laboratory ES&H Section provides labwide support in ES&H. Both the Fire Department and Security are part of the ES&H Section. The head of the laboratory ES&H Section has the authority, delegated by the laboratory director, to stop any unsafe or hazardous activity, including experimental activities. Senior safety officers in the divisions and sections have authority to stop unsafe activities, and the Beams Division Operations crew chiefs have authority to stop unsafe beam-related or enclosure-access activities.

If you know of conditions that may be ES&H violations, you have the responsibility to report the conditions to your spokesperson or to ES&H staff. If you believe an assigned task is a hazard to personnel or the environment, you should not perform the task, but instead notify your supervisor and notify the division ES&H group. You should file complaints about ES&H violations either with the ES&H Section or, if more formal action is needed, with the DOE (see FESHM Chapter 1070).

Responsibilities of Experimenters

Experimental installations pose ES&H hazards. As an experimenter you are responsible for:

- Informing your experiment spokesperson of your arrival as soon as you get to Fermilab.
- Obtaining required ES&H training (and/or certification), personal protective equipment and dosimetry. Consult division ES&H staff for assistance.
- Knowing and following the ES&H requirements as outlined in the Fermilab ES&H Manual and the Fermilab Radiological Control Manual.
- Reporting unsafe working conditions to your spokesperson and the appropriate division's ES&H staff.

Environment Safety & Health Requirements for Experiments

As a user, you will work with the ES&H staff of your division and with the ES&H Section staff. The ES&H staff will help you review your procedures and equipment for potential hazards.

The spokesperson for every Fermilab experiment must obtain all the necessary review approvals before operation of the experiment begins. The Particle Physics Division calls this an "Operational Readiness Clearance," the Beams Division calls it an "Operational Permit." Experiments within accelerator enclosures need both Particle Physics Division and Beams Division reviews and approvals.

These experimental aspects require review and approval before an experiment can operate:

- Mechanical and conventional safety
- Flammable gas safety
- Pressure and vacuum vessel safety
- Cryogenic safety
- Hydrogen target safety
- Electrical safety
- Radiation safety/controlled access
- Toxic chemicals
- Compliance with OSHA and other regulations

Environment, Safety and Health Resources for Experimenters

In addition to the resources of the division ES&H staff, the Fermilab ES&H Section staff has areas of particular expertise that you may want to use. Examples are: instruments and techniques for monitoring radiation; distribution and management of radioactive sources; and transporting and disposing of both radioactive and non-radioactive hazardous waste. Also, the ES&H Section's Activation Analysis Laboratory (AAL) provides services to characterize radioactivity and helps calibrate beam current monitors.

Basic Safety

There are some basic rules that you should know for working safely at

References

You can get ES&H reference materials from the ES&H Section, the division ES&H staff or, in some cases, the Internet. For example:

- Fermilab ES&H Manual
- Fermilab Radiological Control Manual
- Fermilab Emergency Plan
- Particle Physics Division Operating Manual
- Beams Division Safety Manual
- Spill Prevention, Control and Countermeasures Plan
- National Electric Code
- National Fire Code (NFPA)
- Material Safety Data Sheets (MSDS)

Fermilab. Keep in mind that this is not a comprehensive list of ES&H requirements. You can obtain more detailed ES&H information from Fermilab ES&H staff and the Fermilab ES&H Manual.

Radiation Safety

Training and badges. Consult your division ES&H staff to find out what radiation safety training you need. You must wear your radiation badge when you enter a radiation area. You must have current radiation training to wear a radiation badge. You can get a temporary badge at the Comm Center (WHGNX). Contact the Dosimetry Program Manager (ext. 3642, dosimetry@fnal.gov) and apply for a permanent badge if you plan to stay at Fermilab for six months or more.

Radioactive sources. Fermilab has an inventory of radioactive sources for loan to experimenters. Strict controls are in place for radioactive source usage. No one is allowed to use a radioactive source without at least Radiation Worker I Training and Radioactive Source Training (contact the ES&H Section source physicist, WH7E). No one may bring radioactive sources onto the Fermilab site or remove them from the site without receiving prior authorization from the Fermilab Senior Radiation Safety Officer, head of the ES&H Section.

Interlocks. While an accelerator is operating, an electronic enclosure interlock system keeps people out of the area where radiation rates rise to harmful levels. Tampering with any part of the enclosure interlock system is forbidden and may lead to dismissal from the laboratory or denial of access to the site for nonemployees.

Controlled access. Controlled access—entry without breaking the interlocks—is possible in most of the beam enclosures. Only authorized people who have had appropriate training may enter areas under controlled access conditions, and they may enter only under specifically prescribed conditions. Users may become qualified to make a controlled access only after authorization by the division ES&H staff.

Generating, Managing and Disposing of Radioactive Waste. Users must manage and dispose of all radioactive waste according to division, Fermilab and DOE regulations. The experimenter who generates the waste has the responsibility to take steps to minimize the radioactive waste produced. Remove any equipment not needed in beam areas before startup. Any material to be removed from a beamline enclosure (including an enclosure in an experimental hall) must be measured for radioactivity. Contact the Beams Division ES&H Group if you need help from a radiation technician. Consult your radiation safety officer or ES&H staff about proper disposal procedures.

Electrical Safety

Do not work on electrical equipment unless it is disconnected or until it has been de-energized by use of "lock and tag" (LOTO) procedures discussed in the Fermilab ES&H Manual.

The laboratory discourages the use of extension cords, cube taps and other forms of "temporary wiring."

All portable electrical equipment and power tools must be adequately grounded or double-insulated when connected to a power source.

Pregnancy and Radiation Safety

Members of the ES&H Section and your division ES&H staff can answer questions regarding prenatal radiation exposure. They will provide assistance in implementing prudent measures to minimize exposures. Female employees of subcontractors or other institutions should contact their respective employers to learn of options available to them. Article 951 in the Fermilab Radiological Control Manual provides more information on Fermilab's prenatal policy and procedures.

Hazardous Materials Safety

Read hazard warning labels on containers to find out how to handle a chemical or other material safely. If the container has no label, do not use the material until you know what it is and how to handle it.

You can find detailed information on the hazards of a product on Material Safety Data Sheets (MSDS). To locate MSDS, contact your division ES&H staff or see the nearest "Right to Know" posting station.

Store flammable solvents such as methanol and acetone in safety cans and flammable-storage cabinets. Specific regulations govern the use of hazardous chemicals in radiation areas—talk to your ES&H staff.

Personnel Protective Equipment

You must wear safety shoes when there is a risk of foot injury. You may charge safety shoes to your experiment budget.

Contact your division ES&H staff to obtain and properly use a respirator to control the inhalation of toxic materials such as dusts, fumes and solvent vapors.

You may obtain prescription safety eyeglasses through the ES&H Section, WH7NE; you may charge them to your experiment's budget. Both the stockroom and division ES&H staff supply non-prescription safety eyewear.

You must wear hearing protection whenever the noise may rise above the standard of 85 dBA. Such areas are posted. You can get various types of hearing protection devices from the Fermilab stockroom, division ES&H staff and the ES&H Section.

Hazards of Experimental Areas

Every experimental area has a "Hazard Identification List." This list is to be read by all experimenters who work in that area. Hazards at experimental areas may include:

- Trips and falls
- Welding, torch cutting, and brazing
- Exposed high-current and/or high-voltage electrical connections
- High magnetic fields
- Oxygen Deficiency Hazard (ODH) (usually resulting from potential release of cryogens)
- Flammable or explosive gases and liquids
- Chemical hazards (typically solvents, heavy metals)
- Pressure and vacuum vessels
- Radiation hazards from the beam, or from radioactive sources (often attached to the experiment apparatus)

Areas are posted to indicate hazards present.

Laboratory ES&H

ES&H Training. The spokesperson is responsible for ensuring that experimenters receive all the required training that applies to their jobs. Experimental conditions dictate course requirements. You must ensure that your own training is both complete and current. You may determine your current training status by running an Individualized Training Plan (ITP)—accessible through the ES&H Section's Home Page on the Internet, ES&H Home Page/Train Database/Reports. Also, the division ES&H staff can help you determine the courses you need to take. Some common courses that experimenters may need are:

- Radiation Worker I or II
- Controlled Access
- Oxygen Deficiency Hazard
- Laser Safety
- Crane Operation
- Forklift Operation
- Confined Space
- Lock Out - Tag Out (LOTO)
- Radioactive Sources
- Chemical Safety/Hazard Communication

Lasers. You must register all lasers brought to the laboratory with the ES&H Section before use. Other laser requirements may include training and eye examinations.

Ladders and Scaffolding. All ladders and scaffolding used at the laboratory must meet the prescribed ANSI and OSHA standards in their construction and use. Never use metal ladders for electrical work or in areas where there is any possible contact with live electrical parts.

Crane or Forklift Operation. Any experimenter who intends to operate a crane or forklift must have the required training and authorization. You can arrange crane or forklift training through your division ES&H staff.

Confined Spaces. You must have training and a written permit from the division safety officer before you enter a confined space. Typical

examples of confined spaces include manholes, tanks, pipes, sump pits, and Cerenkov counters.

Oxygen Deficiency Hazards. You must have current medical approval and authorized oxygen deficiency hazard training before you may enter areas posted as oxygen deficient hazard (ODH) areas. Contact your division ES&H staff for more information.

Traffic. Fermilab traffic regulations conform to those of the State of Illinois as prescribed in Rules of the Road. Violation of traffic regulations may provoke disciplinary action. Vehicle accidents are among the leading causes of injury at the laboratory.

Firearms and Hunting. Fermilab has a general prohibition against bringing firearms or any other weapons on site without the explicit written approval of the Director. Hunting and trapping are strictly prohibited.

Protecting the Environment

At Fermilab, our policy is to conduct research with respect for the environment. High environmental standards are fully compatible with accomplishing critical research. Here, we give a few basic environmental rules. You'll find more information about environmental standards in the Fermilab ES&H Manual, Chapter 8000 (http://www-esh.fnal.gov:8001/FESHM/). If you have questions, contact your division ES&H staff, or call the ES&H Section Environmental Protection Group at extension 2565.

Division ES&H staffs must review all purchases of chemicals or transport of chemicals to the laboratory. To reduce environmental impact: buy only as much of a hazardous material as you actually need, choose less toxic or less hazardous alternatives whenever you can, and use or find a user for what you buy so that it does not become a waste.

If you have waste chemicals that must be disposed of, arrange disposal through your division waste coordinator.

Waste Disposal

Only certain water solutions many be disposed of by using sinks and/or floor drains (see Lab Sewer Discharge Criteria in the Fermilab ES&H Manual). For those waste solutions that are acceptable in the sewer, be certain that the sink or floor drain is connected to the sanitary sewer. Some drains may be connected to storm sewers or directly to the environment, so if you don't know, ask your division ES&H staff. **NEVER introduce flammable material, hazardous waste, solids, poisons or ethylene glycol (antifreeze) into any drain! Disposing of hazardous or radioactive waste inappropriately can have serious legal consequences for Fermilab and the Laboratory will not condone it. Please check with your division ES&H staff if you are uncertain how to dispose of any waste you generate.**

Be aware that the construction, installation, operation or modification of any air pollution source may require a permit. This includes any source of airborne radionuclides.

Tours, Visitors and Minors in Experimental and Operating Areas

Potential health and safety hazards exist throughout the laboratory—high voltages, oxygen deficient atmospheres, explosive gases, toxic chemicals, heavy rigging, complex machinery and radiation. Delicate, carefully aligned apparatus necessary for the operation of the experimental program is vulnerable to damage. For these reasons, experimenters must follow the rules governing the admission of visitors to experimental areas.

Normally only registered experimenters and Fermilab employees have access to experiments. All tours with more than five visitors must be approved by the division head. Tours with me than 10 require prior completion of a Facilities Request Form. Tours into any radiation area or high radiation area are strongly discouraged and must be approved by the appropriate division SSO and the division head. Additional requirements for tours in these areas are given in the Fermilab Radiological Control Manual. Tours of experimental halls and pits for experiments that are in operation or standby mode must have the approval of the spokesperson, physicist in charge, or liaison physicist in addition to the above requirements. Tours of experimental halls in completed or decommission mode may be arranged through the building manager.

Every user and Fermilab employee who has a visitor has the responsibility to know and follow Fermilab ES&H practices and procedures for the visit.

Children at Fermilab

Everyone under 18 years old, including children of employees, visiting scientists and DOE employees, must be continuously

supervised by an adult while visiting Fermilab. Children may be permitted in certain office areas designated by the responsible division or section head, subject to approval by the division or section head.

Children can visit public and office areas. In general, they cannot visit laboratory areas, e.g. beamline enclosures, experimental halls, counting rooms, portakamps (except those used exclusively for offices) and non-office areas of assembly buildings. On a case-by-case basis, the division head may give permission for properly escorted children to visit specific laboratory areas for a specified length of time. You must get permission before allowing children to visit a laboratory area.

Substance Abuse

Fermilab fully supports state and federal laws concerning the drug-free workplace. Registered Fermilab users, (users who obtain a Fermilab ID,) are expected to comply with Fermilab drug and alcohol use policies and are subject to laboratory disciplinary actions for drug or alcohol abuse. Article 30 of the Fermilab Personnel Policy Guide, Fitness for Duty, states that disciplinary action will be taken for unauthorized consumption of alcohol or being under the influence of alcohol at the work site. Any use, sale, purchase, transfer, or possession of illegal drugs is prohibited. Article 28 describes substance abuse assistance programs and Article 20 describes the laboratory disciplinary procedures. The Fermilab Personnel Policy Guide is available at http://fnalpubs.fnal.gov/policyguide/cover.html

Policies and Rules to Protect Fermilab Computers

INTRODUCTION

The communications needs for research and planning require a broad openness in our systems. Our main concerns are protecting data and systems critical to the operations of the laboratory in pursuit of its mission.

Fermilab's continuing policy puts its first line of defense at the individual responsible for the data and the local system manager.

Roles

The Director has delegated overall responsibility for computer security and related matters to the Associate Director for Information and Technology (ADIT). The Computer Protection Program Manager (CPPM) reports to the ADIT in this area, and is the laboratory's principle point of contact with external organizations (DOE, FBI, etc.) on computer security. The Computing Division Head is an important part of computer security management and generally participates in critical decisions and policy formulation.

Scope

Fermilab's Computer Security Policy covers Fermilab systems, whether on-site and connected directly to the Fermilab network, or on- or off-site and connected to the Fermilab network by the telephone system or other means. The policy and rules described here cover these systems no matter who is the owner or the method of connection to the network.

Fermilab employees and registered users (who have been issued an ID number) are responsible for their own actions under the computer security policy, as well as for the actions of any person who they permit to access a Fermilab system.

APPROPRIATE USE

Fermilab's single mission is science and the laboratory's stated policy is to maintain an open scientific environment where the free exchange of ideas is encouraged and protected. We want there to be unhindered freedom to use computers within a wide area, but this area is surrounded by extremely high walls. We cannot always describe exactly where those boundaries lie, because the technology is changing rapidly and because the walls may shift with shifts in the public's tolerance and areas of scrutiny. Those who use Fermilab's computers and networks will have to use judgment and common sense when they operate near the edges of acceptable use.

Examples of activity that may bring an employee or user near or past the walls of acceptable usage and incur serious disciplinary repercussions (or, in certain cases, criminal sanctions) are:

- Legally prohibited activities on the Internet (child pornography);
- Computer usage that reasonably offends other employees, users, or outsiders, or results in public embarrassment to the laboratory;
- Computer usage that is not specifically approved and which consumes significant amounts of computer resources not commensurate with its benefit to the laboratory's mission or which interferes with the performance of an employee's assigned job responsibilities;
- Operation of a private business or social activity unrelated to the laboratory;
- Violation of license and other computer related contract provisions, particularly those that expose the laboratory to significant legal costs or damages.

Questions of proper or improper use of computers are normally management rather than technical issues and should be dealt with in the normal course of supervisory oversight. The Computer Security Plan includes the necessity of rapid

response investigation of incidents involving extreme behavior, as well as preventive monitoring where there is reasonable cause.

RULES

The Computer Security Plan provides a minimal set of rules which will be enforced. They address incident reporting, protection of system and network integrity, prohibitions against unauthorized activities, ethical behavior, etc. They address matters serious enough that the laboratory is willing to enforce disciplinary measures for first offenses, such as suspending employees or barring users from laboratory facilities.

Incident Reporting

All employees and users are required to immediately report any suspicious incidents involving the security of Fermilab computers or networks, including apparent attempts at unauthorized access. Incidents should be reported to the Feynman Computing Center 24x7 Customer Support Help Desk at 630-840-2345, or to the system manager if immediately available. System managers are expected to report incidents immediately which do not have a simple explanation based on normal routine operation of the system. If there is clearly no urgency, incidents may be reported by email to computer_security@fnal.gov.

Incidents which must be reported include computer- or network-related activity, internal or external to Fermilab, that may impact Fermilab's mission through, for example, the possibility of: loss of data; denial of services; compromise of computer security; unauthorized access to data that Fermilab is required to control by law, regulation, or DOE orders; investigative activity by legal, law enforcement, bureaucratic, or political authorities, or a public relations embarrassment.

All reported incidents will be investigated by the Fermilab Computer Incident Response Team (FCIRT), appointed by the ADIT. The Head of FCIRT may assume full administrative control of affected system(s) until the incident is resolved, and may call on other technical experts for priority assistance.

Employees and users must not disclose information resulting from a computer security incident without authorization. The head of the FCIRT and the ADIT, in consultation with the head of the Computing Division and the Public Information Office, will determine specific information to be disclosed to employees, users, other organizations, and the public.

Unauthorized and Malicious Access and Actions

All employees and users are forbidden to attempt unauthorized entry to computer systems or accounts, or to attempt unauthorized damage, alteration, or deletion of data (including software). Individuals are implicitly authorized to access accounts in their own name, and to alter or delete data in those accounts. They may also access files which are enabled for reading for a class of individuals including the person attempting to access them. The burden of proof of authorization rests with the person attempting to access an account; possession of a password is not proof of authorization.

All employees and users are forbidden to attempt to cause denial of computing or network services at Fermilab. Serious negligence that results in service denials will be treated as any other negligence that results in equivalent damage to the laboratory mission.

Ethical Behavior

All employees and users are required to use the same basic standards of ethical behavior (in regard to fraud, forgery, plagiarism, harassment, libel, etc.) when computers are involved as the laboratory requires when computers are not involved. The same disciplinary consequences for violation will be imposed.

Restricted Central Services

Certain central services may only be implemented by authorized Computing Division personnel. These include: news groups; routing, bridging, or tunneling (including multicast); addressing and naming; external access connections (except via telephone modem); and, network time. Future restricted services may include external mail and mail exploders or reflectors and will be publicly announced.

Security and Cracker Tools

A "security tool" is a tool with the capability to systematically probe, or otherwise gather information about, a system or network in order to discover security vulnerabilities. A "cracker tool" is a tool with the capability to systematically exploit security vulnerabilities in order to attempt unauthorized access, destruction or theft of data, denial of service, or other unauthorized activities. The use of any tool as a security or cracker tool or the possession of any tool whose principal capability is as a security or cracker tool by employees and users is limited to the specific tools, time frame, and purpose, in explicit written authorization signed by the ADIT or CPPM.

System Managers

Employees and users who have root/system/administrator password access to three or more systems or to a major clustered system are required to register with the CPPM (via the web form at http://miscomp.fnal.gov/sysadmindb) so they may be reached to provide assistance during a computer security

incident response. They will be asked to maintain a list of all systems for which they have such access. All system managers will be expected to follow sound system security guidelines as developed by the Computing Division.

System managers may access all "system" accounts and files on systems for which they have responsibility. "System" accounts and files are those not specifically assigned to an individual. In the course of normal system maintenance activities they may disable the computer or its network connections and they may work with an individual's account or files with the following restrictions: they may not physically (in the human sense) read or inspect the data or information in them (except for files enabled for reading by a class of individuals, including the person attempting to read them), and they may not change or delete files in a way that precludes recovering the original data. A person has "system manager responsibility" if a) he/she is registered in the System Manager Data Base for that system or b) the system is assigned as an individual computer or workstation to the person (and registered in the sensitive item data base if applicable).

Division/Section Rules

Divisions and sections may establish security rules or guidelines for systems under their management. These may be enforced by disabling access for a user who is in violation.

CRITICAL SYSTEMS

Computer security incidents involving certain systems could seriously impact the laboratory's science programmatic operations. Such systems may be designated "critical systems" and may be subject to additional computer security policies and procedures, beyond those described here.

How to Get Started

Site access controls

How to register as an experimenter

The responsibilities of experiments' spokespersons

Working with the Particle Physics Division and the Beams Division

CHAPTER 3

As an experimenter at Fermilab you need to know how to get on the site, how to register, work with your host division, and obtain a computer account. If you are a spokesperson or the physicist in charge for an experiment, you have additional responsibilities of which you need to be aware.

Site Access Controls

Fermilab has an electronic gate system to control access to the site. You can apply for an access card and tag at the Key and ID Office. The Key and ID Office is located on the ground floor crossover of Wilson Hall - between the east side and west side elevators (WHGNX). Your access card and tag will allow you to enter and exit through either Batavia Road or Pine Street at any time.

Until you obtain your access card and tag, you will have several options on how to enter the site. During normal working hours, ticket dispensers will be working at both entrances, and during rush hours a guard may be present. If no guard is present, enter through the visitor gate and get a ticket. (Both entrances have a visitor and an employee gate.) When you use a ticket to enter, you must leave through the same gate you entered. If you experience any difficulties, you may use the intercom, located by each exit gate. Press the button on the intercom and you will be connected to the Comm Center.

During off hours you will need to contact the Communications Center in order to enter the site if you don't have an access card and tag. The intercom by each ticket dispenser will connect you to the Communications Center. They will ask you some questions in order to determine your business on the site. They will then allow you to enter.

Registration as an Experimenter

To become an experimenter at Fermilab, you must officially register with the laboratory and receive your identification card. You should register on the first working day after you arrive. To register, go to the Users' Office, on the first floor of Wilson Hall, West side, (WH1W), open Monday through Friday from 8:00 a.m. to 5:00 p.m.

When you register, you give basic information about yourself, your home institution and your experiment at Fermilab. You need to certify that your medical insurance is valid while you are at Fermilab. You also need to receive basic training in key Fermilab safety policies and procedures.

Fermilab policy calls for users' home institutions to sign a document called a "User Facility Class Waiver" covering rights in patents developed at Fermilab. If your institution has not yet signed such a waiver, the Director's Office arranges for a responsible officer of your institution to sign one.

After you register, you will receive authorization to get an identification card and the keys you need from the Key and ID Office. Your ID card is valid for two years or for the duration of your medical insurance, whichever is less. When you receive your ID card, we ask you to keep it with you while you're at Fermilab. You'll need it to make stockroom withdrawals, for example.

After you receive your Fermilab ID, you may request an account on the central computers operated by the Computing Division (ext. 8118). You can access account requests forms on the Internet at http://www.fnal.gov/cd/main/forms.html or on the eighth floor crossover of Wilson Hall.

Some large experiments, such as CDF and DZero, also require experimenters to register with the experiment.

Spokespersons

The laboratory needs to maintain clear, direct and consistent communication with each experiment at every stage from proposal to conclusion. The scientific spokesperson serves as the primary link between the laboratory and the experiment. Thus, every group of experimenters at Fermilab must designate a scientific spokesperson; some experiments choose to designate co-spokespersons. Large experiments may also have Fermilab Managers who serve as head of their respective experiment's Fermilab department in the Particle Physics Division (PPD). The responsibilities of the spokesperson and/or the PPD Department Head for the scientific, technical and ES&H aspects of the experiment must be clarified in a Memorandum of Understanding (MOU) or Project Management Plan with the laboratory. Members of the laboratory staff often need to discuss an urgent matter with a responsible member of an experimental group concerning safety, scheduling or operation of an experiment. Each spokesperson of an experiment should identify its management structure along with a clear chain of command regarding who is to be contacted in various situations. This includes identifying a project manager, an operations manager, a department head, a building manager, or a physicist-in-charge, whom the Laboratory can contact quickly.

Working with the Particle Physics Division and the Beams Division

For each experiment, either the Beams Division or the Particle Physics Division serves as the host division for coordinating the needs of the experiment. Experimenters will work closely with one or both Divisions during all stages of their experiment including planning, design, and set-up of experiments. There are technical experts as well as technical facilities available for help. In addition, Building Managers are assigned to every building at

Responsibilities of a Scientific Spokesperson

- Serve as main contact for the laboratory in all matters related to a proposal or experiment.
- Respond to questions and concerns during evaluation of a proposal for an experiment.
- Prepare a memorandum of understanding (MOU) in consultation with the host division, and supervise preparations for an accepted experiment.
- Maintain a current list of experimenters in the group present at the laboratory.
- Agree with the appropriate division head(s) upon the required level of staffing of the experiment during beam operation.
- Ensure that all members of the group have medical insurance valid while at Fermilab.
- Arrange and be responsible for on-site housing used by the group.
- Ensure that all members of the group have registered, have valid ID cards and appropriate stockroom withdrawal authorization.
- Make financial arrangements for the experiment.
- Ensure that all members of an experiment understand and comply with Fermilab ES&H regulations. If any violation of the rules occurs, the spokesperson has the responsibility to take corrective action and prevent recurrence.
- Inform experimenters about specific hazards of the experiment and the training they require. Make sure that every member receives timely and appropriate ES&H training.
- Arrange for work space for the group.
- Establish computer accounts for the experiment and regularly review the experiment's computing needs.
- Obtain an Operational Readiness Clearance (ORC) or Readiness Permit before operating all, or any part of, the experiment's apparatus.
- Identify the deputy spokesperson, the physicist-in-charge, or other scientific leadership for the experiment.
- Report any change in membership of the collaboration in writing to the Program Planning Office.
- Submit copies of publications and Ph.D. theses.

Fermilab. Building managers are responsible for ensuring compliance with all the relevant ES&H rules and codes. To accomplish this, they coordinate ES&H-related work in their buildings. Experimenters should work closely with building managers to make sure their work complies with ES&H standards.

BEAMS DIVISION

The Beams Division operates and upgrades Fermilab accelerators and beamlines, providing particle beams for both fixed-target and colliding-beam experiments. The Beams Division Headquarters are located in the Cross Gallery (ext. 4468).

Associate Beams Division Head for Systems. The Associate Beams Division Head for Systems helps make the proposal impact statements required for all experiments. This person serves as initial point of contact between the Beams Division and the experimenters until the Beams Division appoints a liaison physicist.

Communication on the Beam. Each Monday, the All Experimenters' Meeting presents short-range and long-range schedules of accelerator operations, the intensity distribution of beams, and a weekly summary of accelerator performance. This meeting provides an opportunity for an open discussion of operations, problems and special considerations. Experimenters may contact the Main Control Room or the relevant Beams Division "Run Coordinator" directly for questions concerning accelerator operations or beam operations. TV Channel 13 displays the current accelerator status and beam-intensity distribution.

PARTICLE PHYSICS DIVISION (PPD)

The Particle Physics Division provides management and technical resources for the construction and operation of particle physics experiments. The division head serves as the initial point of contact for new experiments. The division office is located at WH8W (ext. 3200). Within PPD, large experiments have their own PPD Departments, while smaller experiments, or those in the very early stages of development, reside in the Experimental Physics Projects Department.

Safety Inspections. The division conducts regular safety inspections of buildings and experiments.

Office Space. Office space for experimenters is arranged through relevant departments and the Particle Physics Division office.

Engineering. Engineering and other technical specialists within the Particle Physics Division are available for general technical consultation and may participate in the necessary ES&H reviews required for the Operational Readiness Clearance or Operational Permit. Division technical support must be identified and approved in advance.

Detector Construction Facilities. The Particle Physics Division operates facilities to build experimental apparatus. Experimenters must identify and get prior approval for use of the technical resources they need.

Installation. The Particle Physics Division oversees the rigging, electricians and other trades to install experiments. Outside contractors often provide these services, collectively called "T & M" (for "time and materials").

Survey and Alignment. To ensure accuracy in installation, experimenters designing apparatus should consult the Alignment Group during the design phase on the method of alignment, the required accuracy and the need for fiducial marks.

Operational Readiness Clearance. Each PPD experiment, including test beam studies, must obtain an ORC from PPD before operating all, or any part of, the experiment's apparatus. ORCs are also required during the test phase for partially complete systems. ORC is a sign-off checklist showing that various aspects of the experiment have undergone and passed an ES&H review by the division, that the experiment has provided all specified documentation, and that the division and the spokesperson have jointly conducted a final ES&H walkthrough. See Chapter 2 for more details.

Communicating at Fermilab

CHAPTER 4

How to find out what you need to know and convey what you want to say at Fermilab.

How to Learn What You Need to Know

LABORATORY PUBLICATIONS

FermiNews. The Office of Public Affairs produces the Lab's bi–weekly newspaper. *FermiNews,* once Fermilab's internal newsletter, now is distributed outside the Lab to congressional offices, government representatives, the international science press, the local media, universities and to members of the Fox Valley community. The Office of Public Affairs invites employees and users to send newsworthy items or classifieds to the e-mail address: ferminews@fnal.gov, or contact a member of the Public Affairs staff at 630-840-3351. Requests to get on the mailing list, or to obtain single copies and back issues, should be directed to the above address and phone number. FermiNews is also available on the Internet at *http://www.fnal.gov/directorate/public_affairs/ferminews.* Fermilab publishes a weekly (Friday) calendar, nalcal, of times, topics and locations of all meetings of general interest, seminars, and colloquia held on the site, with general announcements at the bottom of the page. Please submit material for the following week's calendar to the Director's Office, WH2E, (ext. 3211) by noon on Wednesday. nalcal is available on the Internet at *http://www.fnal.gov/directorate/nalcal/nalcal.html*

Fermilab Library Online Catalog

http://fnalpubs.fnal.gov/library/welcome.html

The key to finding information in the Fermilab Library is the Library online catalog. The online catalog is easy to use, contains a record of all materials held in the Library, is available via the Internet, and allows for multiple searching techniques. The online catalog serves as the search engine for the Fermilab Technical Publication Fileserver and includes links to full-text documents including Fermilab's and other institutions' preprints.

> ***"An active field of science is like an immense anthill; the individual almost vanishes into the mass of minds tumbling over each other, carrying information from place to place, passing it around at the speed of light."***
>
> Lewis Thomas in The Lives of a Cell

Fermilab Technical Publication Fileserver

http://fnalpubs.fnal.gov/techpubs/pubs_lists.html

Fermilab technical publications are available online. You can obtain full-text copies of preprints, conference papers, technical memos and physics notes from the Fermilab Technical Publication Fileserver. Publications can be retrieved via anonymous ftp, the Internet, or AFS space. The fileserver also serves as the "inbox" for Fermilab authors to submit their technical reports electronically to the Publications Office. If you would like detailed instructions on how to retrieve or submit a technical report, contact the Publications Office or access instructions via the Internet at *http://fnalpubs.fnal.gov/techpubs/guidelines.html.* Paper copies of all technical reports are also available from the Publications Office, WH15SW.

Fermilab Technical Publication Announcement Service

http://fnalpubs.fnal.gov/techpubs/maillist.html

You may subscribe to the Fermilab Technical Publication Announcement Service. As a subscriber, you will be notified via e-mail when new Fermilab technical reports are posted to the Publications Office Internet site. Announcements will be sent once a day and will list all technical reports posted that day. (Please note that there may be days when no reports are posted.) Reports will be listed by title, author, Fermilab report number and URL of the paper. To subscribe to the technical announcement mailing list, read and follow the instructions provided at the above URL.

Resources for Information

The Information Resources Department publishes a bi-monthly newsletter highlighting new materials, resources and services available from the Library and the Publications Office. The newsletter is mailed to all Fermilab mail stations and is available on the Internet at *http://fnalpubs.fnal.gov/resources/welcome.html*

Closed Circuit Television.

The Fermilab closed circuit television system transmits information about the status of laboratory operations throughout Fermilab. Besides displays of information specific to experiments, there is a display on Channel 13 that provides general information about the accelerator including ramp and intensity, and messages of general interest to the user community.

LIBRARY

http://fnalpubs.fnal.gov/library/welcome.html

The Fermilab Library is located in Wilson Hall on the third floor crossover. Its collection is concentrated in the areas of high-energy, particle, and accelerator physics with additional resources in astrophysics, nuclear physics, mathematics, engineering, and computer science. The Library has about 15,000 books, from college-level texts to more advanced research, including published proceedings of conferences. You will also find reference materials, such as technical dictionaries and encyclopedias, handbooks of tables and formulas, standards and specifications, biographical sources, atlases and a "new books" display.

The Library subscribes to some 200 journals and other periodicals on subjects listed above, as well as newspapers and popular magazines. A walk-up photocopier is available for copying articles for individual use.

Each week the Library receives preprints from high-energy physics institutions worldwide. The Library home page on the Internet has links to many full-text preprint servers. The Library has proposals for experiments at Fermilab and their results, along with Fermilab FNs (Physics Notes), TMs (Technical Memos), Fermilab preprints and theses.

The Library in coordination with the ES&H Section maintains the "Work Smart" standards set. This is the set of federal, state and local laws, regulations and standards to which the laboratory must adhere. Many of the materials are available from the web *http://www-lib.fnal.gov/library/protect/worksmart.html* and may be accessed from your desktop computer or you may use the "Work Smart" computer station in the Library.

The Library's audio-visual room has a television and VCR for viewing the collection of videotaped conferences, lecture series, safety training presentations and other technical programs.

Selected Fermilab Publications

Information and procedural guides of interest to users

- Fermilab Research Program Workbook
- Fermilab Emergency Plan
- Fermilab Environment, Safety, and Health Manual
- Guide for Foreign Visitors
- Fermilab Radiation Control Manual
- Fermilab Telephone Directory
- NALWO Guest Guide
- Activity List (Recreation)
- Education Programs at Fermilab
- Personnel Policy Guide

The Users' Office staff can tell you where to find copies of these publications. Many of these publications are on the Internet. See the Users Survival List in this book or start your search at the Fermilab Home Page http://www.fnal.gov

The Library provides access to CD-ROM journal citation indices and a variety of online databases. Staff members will conduct online searches of commercial databases by appointment.

Public-use X-terminals are located in the Library to access the online catalog, technical publications and other Internet resources. Postscript printers are also available.

You may request materials you don't find in the Fermilab Library. Through interlibrary loan, the library staff borrows books and requests copies of articles, reports, patents, etc. from local, national and international sources. The Library is open 24 hours a day to persons with building access. Library staff are available to assist you Monday - Friday, 8:00 a.m. - 5:30 p.m.

Seminars, Colloquia and Meetings

As a courtesy to the laboratory, experimenters traditionally present oral reports of their experimental results at Fermilab before submitting manuscripts for publication or giving talks elsewhere. Regular seminars and colloquia (see *nalcal* for schedule) provide opportunities to present reports. Seminars and colloquia include:

All Experimenters' Meeting. Weekly discussion of experiments in progress, with emphasis on current status, objectives and needs.

Theoretical Physics Seminars. Weekly reports on formal and phenomenological theory by staff members and visitors.

Physics Colloquium. Weekly presentation of important results in particle physics and other fields of general interest. Generally presented by an outside speaker talking about a completed research project.

Beams Division Seminar. Twice-weekly talks on accelerator physics and technology at Fermilab and elsewhere.

Joint Experimental-Theoretical Seminar. Informal weekly seminar on research in progress.

Computing Techniques Seminar. Informal seminars on computing topics.

Research Techniques Seminar. Internal seminars on beamline design and experiment detector R&D. Held irregularly—watch the notice boards.

Theoretical Astrophysics Seminar. Weekly seminars on current topics.

CDF-DZero Lunch Seminars. Held weekly.

How to Convey What You Want to Say

PUBLICATION

Fermilab Publication Policy.

Journal and Conference Submissions

Users choose the time and place to publish results of research conducted at Fermilab. However, the laboratory requires spokespersons and other authors publishing on behalf of their experiments to follow these procedures:

1. When you submit for publication a scientific or technical report developed from work at Fermilab, you must submit an electronic (Postscript) file of the report to the Publications Office. (Instructions for submitting Postscript files can be obtained from the Publications Office (WH15SW, x3887) or at *http://fnalpubs.fnal.gov/techpubs/guidelines.html*

2. The title page of the report should include your experiment number and the name of the journal or conference to which you are submitting the report.

3. A footnote on the title page of the report identifies work done at Fermilab. The footnote should read, "This work was performed at the Fermi National Accelerator Laboratory, which is operated by Universities Research Association, Inc., under contract DE-AC02-76CH03000 with the U.S. Department of Energy."

4. If you make substantial revisions to the submitted report, you must submit a new electronic (Postscript) file to the Publications Office.

5. When a report is published in either a journal or conference proceedings, you must notify the Publications Office by completing the appropriate web form at *http://fnalpubs.fnal.gov/techpubs/reportingform.html*

"Oh that my words were now written! oh that they were printed in a book."

Job 19:23

A note about publications:

Graduate theses. A graduate student must submit two copies of a graduate thesis resulting from research done at Fermilab to the Publications Office. The experiment number should be printed on the cover sheet of the thesis. The student must also submit an electronic (Postscript) file of the thesis to the Publications Office

fileserver, fnalpubs.fnal.gov. Submission instructions are posted on the Internet at *http://fnalpubs.fnal.gov/techpubs/guidelines.html*

The Publications Office manages the flow of all technical publications arising from DOE-supported work at Fermilab. The Publications Office routes all technical publications to the Office of Research and Technology Applications for review of potentially patentable information. Publishing data is provided to the Program Planning Office, the Director's Office and the U.S. Department of Energy. Copies of all technical publications are sent to the Library for inclusion in the Library collection and cataloging in the Fermilab Library online and the SPIRES HEP database. The Publications Office provides archival services and publication distribution services to over 400 HEP libraries and institutions, industrial affiliates and individual requesters. All technical publications are posted on the publications fileserver making them publicly available on the Internet.

The Publications Office provides brochures that outline the steps for submitting and processing a technical paper and explain copyright and acknowledgment obligations. Instructions are also available on the Internet at *http://fnalpubs.fnal.gov/techpubs/guidelines.html* If you have any questions or problems regarding Fermilab's technical publications policies or procedures please call x3887 or visit the Publications Office, WH15SW.

MEDIA RELATIONS

All users are encouraged to work with the Office of Public Affairs regarding any press releases, press materials and information issued to the media about research results and other activities at Fermilab. Fermilab Public Affairs staff can also work with the public information offices of users' home institutions regarding research and activities at Fermilab. Staff members of the Office of Public Affairs also act as spokespersons for laboratory activities and news. If users have potential "news" or information they would like to convey to the media, Fermilab requests that they contact Public Affairs at 630-840-3351, or visit the office at 1East in Wilson Hall.

PUBLIC RELATIONS

The Office of Public Affairs encourages outreach by employees and users to help communicate information about Fermilab, high–energy physics and basic research. The Office of Public Affairs, located at 1East in Wilson Hall, has materials that users and employees may find useful for talks or presentations at Fermilab, in the community or at their home institutions. Public Affairs has a generous selection of photographs, transparencies, and videos that can be incorporated into presentations. Photographs and transparencies are free for users to take and keep.

The Office of Public Affairs also manages the Fermilab Speakers' Bureau. If you would like to volunteer to be a speaker to a community group or visit a school, please contact the office at 630-840-3351.

VISUAL MEDIA SERVICES

Photography. Visual Media Services (ext. 3349) offers several photographic services:

- Full studio for portraits and tabletop photography.
- Large format cameras, field lighting and commercial photography techniques to provide the highest quality photography.
- A computer database on all photos taken by the department.
- Copies of photos, overheads or slides. (Order from Visual Media Services by mail or phone.)
- Consultations on long-range projects.

You can make an appointment for photographs of groups, equipment and apparatus. Experimenters ordering services must have written authorization from their spokesperson.

Videotape Services. Video production staff at Fermilab (ext. 4364) can help you produce videotapes about research or for training. To produce a videotape, production personnel consult with you and prepare a treatment outline and production agreement for each video project. The outline contains the general approach and description of the tape's contents as well as expected expenses and a deadline. For small projects that require little or no editing, you can use easily operated video recording equipment. The video production staff offers consultation on script development and graphics and provides tape duplication services, with copying fees for tape stock charged back.

Duplicating Services. The laboratory provides services (ext. 3323) in the basement of Wilson Hall to duplicate materials related to the scientific mission and business of Fermilab. Full-time personnel operate high-volume, high-quality duplicators and bindery equipment. Mail or bring duplication-ready materials to the areas, along with appropriate duplication requisitions, one for each request. Duplicating Services cannot handle requests for more than 5,000 copies of one original or more than 25,000 copies of two or more originals. A rush request must have Duplicating staff approval and may require overtime budget approval. Self-service machines in the walk-up area handle smaller copier jobs. Services include an engineering drafting copier.

Planning Your Experiment at Fermilab

CHAPTER 5

The Fermilab director, with the advice of the Physics Advisory Committee (PAC), determines the experimental program by selecting the experiments to be done at Fermilab. The PAC normally consists of 12 members appointed by the director for overlapping four-year terms. The director customarily seeks advice from the Users' Executive Committee in selecting new PAC members.

The Program Planning Office coordinates the experimental physics program at the laboratory, developing experimental schedules and establishing priorities among experiments, in consultation with the director.

Proposing an Experiment

Scientists who would like to carry out an experiment at Fermilab first submit a formal research proposal to the laboratory director. Although it's not a requirement, it often helps to discuss the proposal with Fermilab staff before making the formal submission.

Consideration of Proposals

In deciding whether or not to approve an experiment, the director usually relies heavily on the recommendations of the PAC, which meets several times a year to consider proposals. During an open PAC session, the proponents, or scientists proposing an experiment, make an oral presentation to the PAC. After the presentation the PAC has a preliminary discussion of the proposal and the presentation. Afterward, the PAC may have questions or comments for the proponents, which are addressed either orally at the time or in written form for the next meeting.

At subsequent meetings the PAC considers all the material available regarding the proposal, including the responses to questions and impact statements prepared by laboratory staff, before making a recommendation to the director.

Deciding on Proposals

The director makes a decision about the proposal on the basis of the PAC recommendation and other factors. The decision may result in approval, deferral or rejection of the experimental proposal.

Approval. The director may grant Stage I approval if the proposed physics goals are worthwhile, the experiment seems technically feasible, and the costs in laboratory resources and running time of the experiment appear appropriate for the expected physics results. Experimenters need to recognize that Stage I approval does not represent a commitment of laboratory resources, either in support for setting up the experiment or in running time. Rather, it helps laboratory staff and experimenters in planning long-range projects.

After Stage I approval, the experimenters and the laboratory carry out a careful technical design and cost study for the experiment, and prepare a first draft of the Memorandum Of Understanding (MOU), as described later in this chapter. If the PAC finds the results of this procedure acceptable, and the experiment fits into the overall priorities of the experimental program, the PAC recommends Stage II approval. In some cases, the director grants full approval without the Stage I-II process.

Deferral. The director may defer the decision on a proposal for a number of reasons; for example, a technical question may need clarification or the appropriate Fermilab facility may not be available within a reasonable time. In the case of deferral, the director notifies the spokesperson in writing of this decision and the reasons for it, specifying the conditions to be met before reconsideration.

Rejection. The director may reject a proposal. The director notifies the spokesperson in writing of this decision and the reasons for it.

Withdrawal of a Proposal. The proposal may be withdrawn from consideration at the request of the spokesperson.

Withdrawal of Approval. The director may withdraw approval if the conditions of the experiment's approval have changed sufficiently to warrant reconsideration. The director will not withdraw approval without first discussing the situation with the experimenters and with the PAC.

Appeals. Proponents who wish to appeal a decision should send a written appeal to the director. The director may form an ad hoc committee to help in reviewing the proposal. The final decision on the appeal rests with the director.

Test Beam Requests

Detector R&D or calibration of a detector in a beam line requires a less formal consideration process. However, experimenters must submit a written request to the Program Planning Office well in advance of the proposed beam use time.

Letters of Intent

A scientist may submit a Letter of Intent (LOI) describing a particular physics goal or measurement, without the details of a full proposal. However, it may or may not receive formal consideration.

How to Propose an Experiment at Fermilab

Prepare a cover page.

- Title of proposal
- Names and institutions of researchers, with one designated as scientific spokesperson and one as deputy spokesperson
- Telephone number and e-mail address of spokesperson
- Date of submission

Write a one-page summary.

- Major physics objectives
- Experimental techniques

Prepare the text.

- Objectives of the experiment and physics justification
- Description of reactions to be studied, measurements to be made and the analysis that will yield the physics results of interest
- Description of experimental apparatus, including data acquisition system
- The capabilities of detector elements and sensitivity of final results to claimed capability
- Floor plan of proposed experimental setup
- Estimate of time needed for setup, testing and data-taking
- Required beam conditions, including intensity, length of flattop and cycle time
- Estimate of off-line computing needs
- Cost estimate of major detector components
- Estimated requirements for laboratory facilities and manpower for the construction, installation, operation and removal of the apparatus
- Description of hazardous or toxic materials to be used, if any

Submit 40 copies of the proposal to:

Program Planning Office
Fermilab, M.S. 105
P.O. Box 500
Batavia, Illinois 60510

Fermilab sends copies of proposals received to the libraries at Fermilab, SLAC, BNL, LBL, CERN and IHEP/Protvino.

How to Request Test Beam

Well in advance of anticipated test beam use, submit to the Program Planning Office a written request with the following information:

- Physicists and institutions involved in the study, and the name of the spokesperson
- Description of the detector to be studied and the purpose of the study
- Physical layout of the detector and associated equipment
- Beam requirements, including an estimate of the beam time needed
- Data Acquisition System and other electronics to be used, and computing needs
- Financial arrangements
- Hazardous materials involved, if any
- Length of time the experimental area will be occupied
- Other special conditions

Appropriate members of the laboratory staff study the document to determine feasibility of such a test. Then the spokesperson or designee prepares an MOU to the laboratory directorate for review and authorization.

Memorandum of Understanding

When the director notifies the spokesperson that a proposal has been approved, the laboratory asks the spokesperson to review the support required for the experiment with the Beams Division, Computing Division and Particle Physics Division. Normally, the spokesperson prepares a draft memorandum of understanding, or MOU, for implementing the experiment, which is then reviewed by the various divisions.

In particular, the staff of the divisions review the draft MOU for feasibility of the experiment in terms of personnel, cost, accelerator impact and time scale. If the request for support in the MOU differs significantly from the proposal, or if the proposal cannot be implemented with the available resources of the divisions in a reasonable time, the proposal goes back to the director for reconsideration. When an acceptable MOU has been drafted, it goes to the director for signature.

The MOU serves two important purposes. First, it lets the laboratory assess the demands posed by approved experiments, including the adequacy of available funds and the scope of the experimental program. Second, after the laboratory and users have negotiated and accepted the document, it serves as an understanding between Fermilab and the users through the planning and data-taking steps of the experiment. The MOU includes computing needs for data analysis and provision for the removal of the apparatus. The more specific the MOU, the fewer the misunderstandings that arise during the course of the experiment.

Drafting an MOU

Personnel. The MOU provides a list of people who work on the experiment and their home institutions. The MOU clearly designates a scientific spokesperson and deputy spokesperson for the experiment. The document shows any additional research commitments for each participating physicist listed. The withdrawal of a senior physicist from an experiment requires a revision of the MOU and may lead to reconsideration of the approval for an experiment.

Any MOU that involves a commitment from a foreign institution requires a letter from a responsible representative of that institution concerning the participation and funding of its members.

Beams. The MOU sets forth details of the beam requirements, such as maximum momentum, incident proton intensity, beam intensity, spill length, or luminosity.

Equipment and Services. The MOU sets forth all major items and services needed for the experiment, clearly identifying which items Fermilab will provide and which will be provided by users. To facilitate review of the MOU, ordinarily the laboratory list is separated into subgroups, one for each division that will make a contribution. As a rule, the laboratory provides general purpose, reusable equipment for approved experiments, while users provide items unique to each experiment, or items that the group will keep after the experiment ends. The cost of each item should be shown in the right margin of the page.

The MOU includes estimates of construction costs of building special facilities for the experiment. It also includes estimates of major operating costs such as rigging, gases, computing and the like. The

laboratory may distinguish between operating and equipment costs in editing the MOU.

Funding. The MOU presents a summary detailing what funds are available and in what fiscal year, including required incremental funds. The document should indicate sources of funding and give a rough breakdown of budgets. In particular, the MOU should specify the experimenters' funding source (DOE, NSF, etc.) and contract number for each institution and budget code at Fermilab.

The laboratory normally adds administrative charges to user direct charges. (See Chapter Six.)

Special Considerations. The MOU tells how much beam time the experiment needs, taking into consideration the time needed for setting up, testing, data-taking and dismantling of the experimental equipment. If the proposal's approval calls for a specific number of particles on target, the MOU should say so. This is called the duration of the run, and it influences planning; it must agree with the conditions of approval. This section describes any special operating conditions that may be required—test beam needs, for example. For experiments performed within accelerator enclosures, a protocol between the Beams Division and the experiment outlines the safe design, installation and operation of the experimental apparatus. It addresses requisite safety responsibilities, reviews and concerns.

Experimental Planning Milestones. The MOU presents experimental milestones in sequence and includes tentative dates for beginning the installation and for beginning data-taking. If the experiment requires construction of major pieces of equipment, the MOU should specify dates for one or more stages of the design, procurement and construction process.

Computing. The MOU sets forth the allocation of computing resources to the experiment according to terms negotiated between the Computing Division and the experiment.

The experiment offline liaison and the Computing Division offline liaison (see Chapter Eight) negotiate the offline portion of the Computing Section of the MOU. To determine the computing resources required for data analysis, the experimenters describe plans for analyzing their data and the number of stages anticipated, from code development through production, stripping, final data analysis and Monte Carlo.

The MOU sets forth the Computing Division's support of experiments' online requirements. The Computing Division MOU coordinator, in collaboration with the departments involved in experiment support, meets with the experimenters during the early stages of experimental planning to define the commitment of the division to the experiment's online and data acquisition needs, among other things. For online needs, they consider:

- Software support needed for the experiment during the online life cycle stages of planning, commissioning, and running.
- The overall architecture of the data acquisition and online system.
- The computer system types, the attached peripherals and networking considerations.
- Front end instrumentation and data acquisition buses to be employed.
- Online and data acquisitions oftware requirements.
- Hardware and software maintenance and support requirements.

The Computing Division then budgets for the above requirements and procures the necessary resources.

Experimenters should make sure to allow enough time for procuring equipment before the expected turn-on dates, because no stock facilities exist for some devices and systems.

Finally. the MOU includes a copy of the current one-page summary of the experiment, as an appendix. MOUs need to be amended from time to time; in some cases, the spokesperson and the laboratory completely rewrite them.

Schedule of Experiments

The Program Planning Office develops the schedule of experiments following the guidelines set by the director.

At the Monday All Experimenters' Meeting (see nalcal for schedule), groups with running experiments or preparing experiments to run describe the status of their experiments and present their requested running conditions for the forthcoming week.

Representatives from various sections of the laboratory meet with members of the director's office at the Tuesday Morning Scheduling Meeting to discuss the details of the schedule and to assign priorities. The resulting running plan is posted on the Accelerator Information Board on the Internet at *http://adwww.fnal.gov/scripts/d11?ch13*

When the accelerators are operating, the Beams Division holds a 9:00 am meeting Mondays, Wednesdays, and Fridays to make necessary short-term adjustments to the planned schedule. All running experiments are encouraged to send representatives to this meeting.

Nuts and Bolts

CHAPTER 6

Financing, Equipping and Staffing Your Experiment

Finances

To help users set up and carry out experiments, Fermilab provides a variety of materials and services to experimenters and bills the cost to the user's home university or laboratory.

To use home institution funds for carrying out an experiment at Fermilab, the user establishes an account: the home institution writes a purchase order to Fermilab, directed to the Chief Accounting Officer, WH4E, indicating the user's level of signature authority; the experiment name and/or number; the dollar limitation; the type or classification of services or materials covered; and the time period for which the order is valid. The dollar amount and the time period should both be adequate to complete the experiment. (When the user exceeds either, the home institution issues a change order.) Then the user receives a budget code to use at Fermilab, much like a department store charge account.

The experiment's spokesperson establishes authorizations—for example, stockroom withdrawal authorization—with the concurrence of the fiscal officers of the users' home institutions so that users' ID cards have appropriate coding.

In some cases, the Program Office of the DOE High Energy Physics program puts university funds directly into Fermilab's "Financial Plan" to be used by and for the institution's experimenters at the laboratory. Although the funds are for the use of the university personnel, because they are in the Fermilab Financial Plan they are subject to the terms and conditions of URA's prime contract with the Department of Energy for operation of Fermilab.

Billing

Fermilab submits monthly bills against the institution's purchase order for such items as purchases, special services rendered and telephone expenses.

To reimburse the laboratory's administrative costs, the bill includes a surcharge added to the total billing. For more information, including current rates, contact the Fermilab Accounting Department.

Invoices must be paid promptly; payment terms per DOE Directive are "net 30 days." It is the institution's responsibility to have a payment system in place to assure prompt payment of Fermilab invoices.

Institutions with accounts more than 90 days past due may be suspended from doing research at Fermilab or using any of Fermilab's facilities, including computing. The suspension lasts until the accounts are brought current. Habitually delinquent accounts may mean permanent denial of access to the Fermilab site or the use of its facilities.

Invoices with disputed charges should be processed less the disputed charges, with the deductions and the reasons noted. If the Fermilab Accounts Receivable Group cannot resolve the question, then the Chief Accounting Officer resolves the dispute. Fermilab will not consider disputed charges delinquent.

Institutions must pay charges by their users which are not incurred in accordance with their institution's policies—personal phone calls, travel not preapproved, for example—because Fermilab considers the

user an agent of the institution. The institution must recover the unauthorized cost from the individual user.

Although most of the policies and procedures are the same as those under a "cash reimbursement policy," as outlined above, there are some differences. When the Department of Energy puts funds into Fermilab's contract for a particular institution, the head of the Business Services Section sends the institution a detailed policy and procedure statement concerning the use of these funds. This memo is also available from the laboratory's Accounting Department.

Procurement

Fermilab's Procurement Department (ext. 3521) acquires goods and services. Procurement specialists will help you plan your procurement requirements for computer equipment, construction services, fabrication, electronics, repair and operation. Fermilab has a ProCard system that Procurement can explain.

We encourage users to ask Procurement for information about the availability of products, and to arrange for sales representatives to come in and discuss technical matters. Users may purchase items for cash (up to $50) from vendors. For reimbursement, a petty cash form, with receipts, a budget code and necessary approval are required.

Fermilab has a standard purchase requisition form that should be completed and sent to the host division office after the appropriate signatures for the experiment or account have been obtained. The staff processes the order and maintains accounting records. (Note that you must get ES&H Section approval for the purchase of radioactive sources; see Chapter 2.) Items purchased are normally delivered to Receiving and then delivered to the user by Fermilab personnel. However, if circumstances warrant, you may pick up materials directly from Receiving; to do so, make arrangements in advance with the Receiving Department (ext. 3575).

Fermilab's contract with the U.S. Department of Energy obliges the laboratory to conform to DOE and federal procurement regulations. For procurements of more than $2500, the laboratory must obtain competition. However, procurement regulations recognize that situations sometimes make competition impractical or impossible. In these circumstances, Fermilab may exercise judgment waiving the bidding procedure, documenting why bids were not solicited and how the laboratory determined that the price was fair and reasonable. If you feel you need to make a sole-source procurement for more than $2500, consult the Purchasing Group manager (ext. 4168) or the Contracts Group manager (ext. 3767) for guidance.

Fermilab Stores

The Fermilab Stores Catalogue lists all supplies available in the Fermilab storerooms. Users may borrow copies from division or section offices or storerooms. The stores catalogue is available on the Internet at *http://www-stock.fnal.gov/stock/*

The Fermilab Stockroom (ext 3825) at Site 38 is open on workdays from 7:00 a.m. - 11:45 a.m., and from 12:30 p.m. - 4:30 p.m. (You can get emergency access to stockrooms at other hours by calling Security at the Communications Center, WH1NE, (ext. 3000).

How to Withdraw Stock

Only authorized personnel with valid Fermilab identification cards may withdraw stock. Authorization levels are entered electronically into the name and address system of the laboratory and coded on your ID card. These codes indicate the total permitted dollar value per withdrawal:

- "X" Not authorized to withdraw stock
- "1" Not to exceed $500.00
- "2" Not to exceed $2500.00
- "3" Unlimited

Make withdrawals in person or by submitting a list of your requirements including stock numbers, quantities, descriptions, your ID number and a valid budget code. Possession of a Fermilab ID with an authorization code of 1, 2 or 3 does not mean automatic stockroom authority; certain stock items—alcohol, for example—require special authorization. The stockroom handles requests for these items on an individual basis.

To order stock compressed gas, call ext. 3808 and tell the type of gas, how much you need, your budget code, group, delivery instructions, name, badge number and telephone extension. Orders placed by 2:00 p.m. will normally be filled the next day.

Property Management

To distinguish Fermilab-owned equipment from user-owned equipment, users should clearly identify all equipment they bring to the laboratory.

The Property Management staff help users arrange for long- or short-term loans of Fermilab equipment for use off site. After approval of the request by the Fermilab division directly responsible for the equipment, the Property Management Group handles the administration of the loan.

Fermilab has very limited warehouse storage space. However, because we recognize that sometimes experimenters need to store

experimental apparatus, rather than returning them to the home institution, experimenters can arrange for short term storage by calling the Warehouse Group (ext. 3577). Note: Fermilab does not permit storage of hazardous materials such as flammable liquids, corrosives or radioactive materials. The laboratory provides storage on a space-available basis. Charges for materials in warehouse storage are billed semi-annually to the requestor's budget code. There is no charge for material stored outdoors—for example, at the railhead.

Fermilab is prohibited by DOE regulations from assigning sensitive items or Accountable Property, i.e. Capital/Controlled equipment, to non-employees. All such property must be assigned to a Fermilab employee.

Shipping Experimental Materials or Equipment to Fermilab

Before making a shipment to Fermilab, consult the Traffic Department (ext. 3470) for specific shipping information and instructions. The shipping address is:

Fermi National
Accelerator Laboratory
Wilson Road & Kirk Road
Batavia, Illinois 605l0

Attention: Shipping and Receiving Department c/o User's Name and Experiment Number

For all shipments, provide the Traffic Department with the experiment number, agency or shipper, the name of a user at Fermilab familiar with the shipment, delivery destination at Fermilab, the size, weight, and number of pieces, an itemized list of equipment, and storage requirements, if necessary. After the equipment arrives at Fermilab, make all subsequent arrangements through your experiment's management.

Technical Support Services

Machine Shops. Experimenters who need the services of a machine shop can call on two large shops, the Village Machine Shop and the Wilson Hall Shop, and 10 smaller satellite shops located throughout the site, all operated by the Technical Division. The satellite shops, each staffed by a machinist, contain some equipment that qualified nonmachinists can use. (The machinist in charge at the site decides if you're qualified.) Any work that must be done by the TD Machine Shop personnel should be coordinated through your experiment management; you will need a purchase requisition and suitable drawings. You can also obtain ready access to any of about 60 commercial Chicago-area machine shops through the Task Order operation at TD.

Product Testing and Measurement. Do you need to evaluate conformity of manufactured products to dimensional and material specifications? The Quality Control Group of the Technical Division has an array of test and measurement systems for this purpose, including computer-controlled 3-D coordinate measurement machines, capable of making almost any conceivable mechanical or optical measurement. The group has hardness testers and inspection systems using ultrasonic, eddy current and magnetic induction techniques. The Quality Control Group also has a blanket order with an outside firm to do quick-turnaround chemical analysis and physical testing of samples.

Materials Testing. When it comes to special materials—polymer composites and adhesives, for example—and their properties, you may want to consult with the Materials Development Laboratory (MDL) in the Technical Division. This group has expertise in formulating special epoxy resins for everything from optical adhesives to cryogenic materials and the insulation of high power and superconducting coils. They can advise you in almost any area of plastic materials. They

Shipments From Foreign Countries

Through the services of the U.S. Department of Energy and the U.S. Department of State, Fermilab will arrange for a U.S. Customs waiver, post a Temporary Importation Bond (T.I.B.), or pay import duties on materials shipped to the laboratory from foreign countries. Getting a waiver takes a minimum of three weeks.

Besides following the general instructions, users shipping materials from foreign countries need to provide additional information, in advance, to the Traffic Department (ext. 3470), either by telephone or letter: foreign consignor; foreign freight forwarder; waybill/airbill number and package identification number; date of shipment, port of entry, vessel name or aircraft flight number; arrival date; value of shipment for customs purposes; a brief description of the equipment; and the experiment number. Receipt of this information will enable the laboratory to effect delivery of the equipment with least delay. The experimental group must pay any storage charges incurred while the shipment is being cleared through Customs. In order to avoid laboratory overhead costs, route inbound shipments on a "freight prepaid" basis and outbound shipments on a "freight collect" basis.

have a testing lab for tensile, compressive, impact, creep, cryogenic, optical and some electrical properties with environmental chambers and high- and low-temperature facilities. They have several TV-equipped microscopes, and metallographic sample preparation equipment.

Magnet Testing. The Magnet Test Facility at the Technical Division offers a unique facility for precision measurement of magnetic fields. This facility can test beam-line type magnets that can be transported to the testing area located in the IB1 building at the Industrial Area.

Facilities Engineering

Engineering. The Engineering Group (ext. 8640) of the Facilities Engineering Services Section (FESS) offers the services traditionally found in an architectural/engineering firm: architecture, civil and environmental engineering, structural engineering, mechanical and controls engineering, fire protection, electrical engineering, estimating and construction management. The Group sometimes uses task order contracts with commercial architectural/engineering firms to augment its own manpower. Project management for an experiment should arrange for services, such as preliminary engineering studies and reviews, from the Engineering Group. The Associate Director for Operations Support sets the priorities for conceptual and final design work, building modifications and new facilities.

Time and Material (T&M) Coordination. Installing experiments may require the services of construction tradesmen—riggers, iron workers, millwrights, carpenters, electricians, pipe fitters, HVAC workers, sheet metal workers, insulation and general construction laborers and heavy equipment operators. Project management for each experiment oversees T&M in the installation of experiments. The Engineering and Technical Teams coordinate and supervise T&M activity in the Particle Physics Division. FESS's Services Group coordinates the activity lab-wide.

Operations Requests. Operations, maintenance and repair of all electrical, mechanical and refrigeration equipment that supports experimental equipment, as well as all general site utilities, fall within the responsibilities of the FESS Operations Group. This does not include equipment used directly in experiments. The Operations Group is responsible for the 345 KV through 480 volt distribution system, industrial cooling water, deionized/low conductivity water, domestic water, natural gas, sanitary water, fire protection systems, master substation and the Central Utility Building operation and maintenance. FESS Operations also coordinates crane inspections. Requests for services normally go through the building manager to Work Central (ext. 3434) where the craft shops coordinate the people, parts and custody requirements for work completion.

Building Maintenance - Outside. Exterior maintenance and repair of all Fermilab buildings, including carpentry, siding and windows fall within the responsibilities of the FESS Operations Group (ext. 3789). Leaking roofs and overhead door service are the responsibility of the Services Group within FESS (ext. 3824). Project management requests these services through the building manager.

Building Maintenance - Inside. Cleaning and custodial services of all Fermilab buildings and some limited painting of Fermilab buildings come from the Services Group (ext. 3824) of FESS. The group also handles operations and interior modification and repair of Wilson Hall.

Care of Roads and Grounds. Roads, parking lots and hardstand maintenance and repair fall within the responsibilities of the Services Group (ext. 3303) whose staff also manage snow removal, traffic barricades, road signs, landscape care, wildlife care and nuisance animal control. This group also handles trash removal and propane gas distribution. Make requests for service through your building manager.

Staffing Your Experiment

On-Call Personnel. Experimenters may requisition on-call personnel through the Fermilab Employment Office (ext. 5810). On-call employees fill short-term, temporary openings either full- or part-time and receive the following benefits: shift premium, overtime, social security and workers compensation. Complete a purchase requisition with experiment number, university, name of the Fermilab group to which assigned or where located, budget code, description of duties, skill requirements and expected length of assignment. The requisition requires approval by the division head responsible for the experiment and the laboratory director. A personnel administrator from the Employment Office will coordinate the employment process with the experimenter. The personnel administrator will arrange for the employment physical exam of a selected candidate and enroll the person as an on-call employee. Time sheets go to the Employment Office, which also distributes paychecks.

Temporary Help and Contract Labor. An experimenter may requisition temporary help or contract labor through the Business Services Contracts Department (ext. 3387). The purchase requisition

must include a description of the work to be done, skill requirements or special qualifications, dollar limits, period of employment and budget code and university information. The Contracts Department provides the experimenter with resumes and arranges for interviews and background checks. After evaluation of resumes and interviews, the experimenter notifies the Contracts Department of the selected candidate, along with a written summary of the evaluation criteria and rationale used in the selection or rejection of the individuals interviewed, and the date and time the individual will start work, the duty location, the name of the immediate supervisor, and any special reporting instructions.

A contract employee must complete an Agency Employee Registration form within three working days of assignment at Fermilab. The form should be sent to Fermilab Communication Center at Mail Station 101. For more information about temporary help or contract labor, call the Procurement Department (ext 3521).

University Student Help. If university students are brought to Fermilab to help with or participate in an experiment, please remember the restrictions on persons under 18 years old (see Chapter 2).

Computing for Your Experiment

CHAPTER 7

Advanced computing at Fermilab has developed in a unique environment, physically and intellectually close to the needs of experiments. As a result, the Computing Division can offer experimenters outstanding computing resources for acquiring and analyzing data:

- On-line computing via hardware and software support.
- Fast turnaround computing to support experiments during data taking.
- Batch processing computing for analysis of data acquired at Fermilab and for Monte Carlo calculations.
- General-purpose batch and interactive computing for program development and analysis, project management and tracking, and document preparation.
- Extensive local and wide-area networks to facilitate communication.
- Support of many local workgroup computing activities.

The Memorandum of Understanding

After a proposed experiment receives Fermilab approval, the experiment and the Computing Division reach an understanding about how much and what kind of computing resources the experiment will use. The memorandum of understanding spells out this understanding, and the Computing Division allocates resources according to their availability and in line with laboratory priorities. Formal meetings or consultations are used to schedule major production activities; frequent consultation between the experiment and the division deals with major development projects. The division also provides some general computing resources for smaller efforts on a fair share basis—that is, the division doesn't favor an experiment in the use of computing, except at the level of experiments running versus experiments not running.

The division and the experiment periodically review the MOU. The spokesperson should schedule a review of the experiment's computing status and needs at least every three months.

The Computing Division aims to provide the level of reliable computing your collaboration needs. If problems or shortfalls arise, you can assume that the division will help to resolve them within the capabilities of its human and financial resources.

A note for experimenters:

At any given time, the Computing Division supports a group of different computing architectures. We don't insist on adherence to any particular coding standard, but we do encourage experimenters to write code and arrange their analysis and production environments so that they can run on a variety of platforms. Experiments that position themselves to take advantage of as many of the supported architectures as possible have the best chance of efficiently meeting their offline computing requirements.

Liaisons

The offline area of the Computing Division, the online area, and the experiment all provide liaisons. The liaisons facilitate communication between the division and the experiment, identifying needs and allocating resources.

Online Liaison. During development of the MOU, the Computing Division assigns one or more online liaisons to the experiment. This liaison provides the primary day-to-day contact between the experiment and the online support arm of the Computing Division. Online liaisons actively connect an experiment to the large body of expertise in online and data acquisition hardware and software in the Computing Division.

Offline Liaison. Many experiments, including all running experiments, have an offline liaison assigned from the pool of physicists and computer scientists in the Division. The liaison keeps the experiment informed about Computing Division activities, policies, resources, limitations and plans; and communicates to the Computing Division the experiment's needs, plans, problems and concerns. The liaison keeps the experiment and the division working together to accomplish the experiment's offline computing tasks. The liaison reviews and advises on all major requests for resources, passes them for implementation to the relevant departments, and follows up to ensure that they have been satisfied promptly and to good effect.

Experiment Liaisons. For its part, the experiment designates an online contact person to serve as a coordinator for the experiment in matters relating to online computing and data acquisition. In addition, each experiment appoints a person generally available at Fermilab and familiar with the offline computing of the experiment to serve as a liaison from the experiment to the division. The experiment's offline liaison provides information about computing to the experiment and channels feedback from the experimenters to the division. The experiment's major requests for resources must come through this person.

Liaisons make possible clear and consistent communication. The experiment offline liaison helps the experiment—which may have more than 100 people actively engaged in data analysis—speak to the division with one voice. By the same token, the Computing Division has almost 200 people; and, while experimenters can certainly address their requests to people other than the Computing Division offline liaison, we do ask that experiments review any major commitment of resources with the Computing Division offline liaison in advance.

Allocating Resources

The experiment offline liaison and the Computing Division offline liaison negotiate major requests for offline resources. If the request doesn't conform to the general groundwork in the experiment's MOU, it may be necessary to write an addendum to the MOU or otherwise come to written agreement. Small requests can go through normal channels, such as request forms; the Computing Division will address any questions about the request to your experiment's offline liaison.

Computing at Fermilab

The Fermilab Central Computing Facility, located in the Feynman Computing Center, comprises UNIX clusters for batch and interactive computing (FNALU), UNIX and PC farms, hierarchical mass storage systems, dedicated clusters for specific experiments, central mail (FNAL) and print servers, the ACPMAPS Lattice Gauge supercomputer, and media translation equipment such as tape copy facilities. The central UNIX systems are made up of hardware from several popular vendors. The farms run the UNIX operating system and are primarily used for long production analysis tasks, for example track reconstruction. All systems communicate with the Internet for both internal and external data transfers.

Experiment systems typically consist of a UNIX host, with one or more UNIX and PC workstations, called workgroup clusters.

Data acquisition systems supported by the Computing Division include a UNIX/VME based high rate data acquisition system (DART) used by a wide variety of fixed target experiments. Data Acquisition interfaces from these systems are supported to CAMAC, FASTBUS and VME.

The Computing Division also provides planning, systems, application software and consulting support for workgroup computing. The division provides support and trouble shooting for Fermilab-purchased computers and promulgates standards for computer configuration, computer backplane configuration, and I/O devices for PC and UNIX computers and x-terminals.

The division provides electronics and data acquisition interface support for a variety of modules in NIM, CAMAC, FASTBUS and VME, as well as test software and hardware for such modules.

The Computing Division maintains a central pool of electronics (PREP) and computing equipment for use in experiments. All equipment purchased by the Computing Division as part of an experiment's MOU comes from this pool.

Experimenters receive equipment either by over-the-counter issue or on-site installation. The Computing Division issues instruments and small equipment items directly to the experiment's representatives. Note that the division issues over-the-counter equipment only if the MOU calls for it; thus, experimenters should make sure they request enough equipment to prevent shortfalls. Computer systems are usually pre-configured and delivered in place by the various hardware groups. The MOU process specifies details of such installations.

Where to Find the Services You Need

Most Computing Division staff offices are on the sixth and eighth floors of Wilson Hall, and the second and third floors of the Feynman Computing Center.

Computer Accounts. To get an account on the central mail server (FNAL), the central UNIX Cluster (FNALU), the CDF central UNIX or VAX Cluster (CDFSGA and FNALD), and the DZero UNIX and VAX Clusters (D0CHA and FNALD0), fill out a form from the office on the eighth floor crossover of Wilson Hall. Account request and other forms are also available on the Internet at *http://www.fnal.gov/cd/main/forms.html*

This form requires your Fermilab ID number, your signature, and the signature of your supervisor or experiment spokesperson. Return the form to the eighth floor crossover, and you will receive your account on the same working day, or, at the latest, the next working day.

Other forms allow you to make changes in resource allocation (such as FNALU disk quota changes), networking requests, and PREP equipment requests. If you or your experiment needs to vault magnetic tapes, you can obtain a code for external labeling. Some request forms are available online in INFO (see below) on the FNALU cluster.

Help When You Need It. During business hours, the Customer Support Help Desk, (ext. 2345) serves as the primary point of contact for general and offline computing issues. Computer and Communications Repair Services can be reached at ext. 4373. After hours, the operations supervisor (ext. 2746) deals with Central Facility operational or emergency issues. The operations supervisor can page on-call support personnel during off hours. Potential computer security incidents should also be reported immediately to the Help Desk (discussed more fully in Chapter 2 of this publication).

Send non-urgent questions, suggestions, or problems by electronic mail to *helpdesk@fnal.gov* *HELPDESK* is read regularly on weekdays.

Call your experiment's online liaison (the Computing Division office at ext. 3690 can tell you who it is) when you have questions and concerns about online and data acquisition systems. Departments within the Computing Division provide help on detailed technical questions as the need arises.

Computing Division Library. The Computing Division library, WH8NE, has limited local documentation in self-service cabinets. The primary source for documentation is the web, starting either from the Computing Division home page *(http://www.fnal.gov/cd/)* or from the documentation page to do detailed searches *(http://cddocs.fnal.gov/cfdocs/productsDB/docs.html)*. The stockroom carries some UNIX manuals and other commercial books. You must order other manuals, including manuals for most proprietary products, from the vendor. In many cases the librarian can provide ordering information.

News and Information. The Computing Division publishes a regular newsletter on the World Wide Web to announce new features, programs, changes, ES&H issues and other timely information, as well as general or educational material. Current and back issues can be viewed at *http://www.fnal.gov/cd/CDN/*

Each central computer system has a news service, updated frequently, with much of the same information. New announcements are presented at system login. Some information is also posted to Usenet news groups, but virtually all information is posted on the appropriate Web pages

Software and Documentation. The Physics Analysis Tools and Online Systems Departments and the UNIX Applications Support Group support a large selection of general-purpose and physics-related software, and many of the products are supported on all of the major platforms. Users' guides to the various central computers describe how to access the software on that computer. The Computing Division library has a list of the available software and local documentation.

The Computing Division library also distributes online and data acquisition documentation, again all available on the Web.

A system named UPS, for "Unix Product Support," supports versions of programs that run on UNIX platforms; you may obtain them by running UPD (Unix Product

Distribute). The document "UNIX at Fermilab" has information about this system.

Connections to Networks. The Computing Division provides and operates an extensive Fermilab local and wide-area network, and regulates its access and use. The Computing Division must approve and coordinate any attachment to the network. Because of the importance of networks to the laboratory's operations, Fermilab reserves the right to protect the integrity of the network.

If an experiment plans to use the network for intensive local data transfer, such as workgroup computing using local area clusters or YP protocols, or other intensive client/server transactions, the Computing Division will provide and manage an appropriate filtering device (bridge or router). Early consultation allows the division enough time to procure and install appropriate equipment.

The Computing Division maintains network name and routing tables for the laboratory. The division assigns network addresses, to guarantee uniqueness; and node names must be registered with the Computing Division to make them available to other users. You can request a form for this purpose by sending an electronic mail message to *netmanager@fnal.gov* or filling out the form on the Internet.

Completing a connection request form, available on the Web and at the Wilson Hall eighth floor crossover, starts the process of attachment of systems to the network. The Computing Division online or offline liaison must review major requests. Again, we encourage early consultation with the Computing Division, so that we can procure and install appropriate equipment and cabling.

Magnetic Tape Management. A tape retention policy aims to maximize the accessibility of tape data actively being used on systems in the Feynman Center and to provide archival storage for data that may be needed later. To do this, we must get rid of redundant and obsolete tapes. The policy gives a vault quota to each experiment; the number of unique raw data tapes and the number of physicists on the experiment determine the quota, run by run. This quota is halved three years after a given run and and goes to zero after five years. For the details, refer to the document MR0002 available from the Computing Division library.

Acquiring PCs and Workstations. If your experiment decides to acquire personal computers and workstations through the Fermilab Purchasing Department, there is an additional form that must be filed together with the purchase requisition. The eighth floor crossover of Wilson Hall has the guide you need, "Fermilab Guide for Acquiring Personal Computers and Workstations," along with the format for the required Abbreviated Implementation Plan.

Workgroup Computing

Members of a workgroup and the Computing Division negotiate support for the workgroup cluster. Support varies from occasional consultation, to system support for upgrades, to very intensive involvement. In all cases, however, the workgroup must provide a local system manager to carry out routine functions such as backups and account management. To take full advantage of the capabilities of the Computing Division, members of workgroups should work closely with Computing Division personnel on hardware, networking and software issues as they develop their systems.

Local systems are bound by the same rules for computer use and security as the central system. The local system manager has the responsibility to implement Fermilab rules on the local system. Fermilab may monitor the local system to ensure compliance.

General Consulting. The Computing Division provides general consulting to all Fermilab experimenters. However, if you need help with system or hardware issues on a distributed platform, the consultant will probably refer you to an appropriate support person.

System Support. Distributed workgroup systems have local system managers as well as backup system managers assigned from the Computing Division. If you have a problem that appears to be system- or hardware-related, call your local system manager first.

Software Support. The Computing Division provides support for hundreds of software packages. Many come from vendors, many come from other laboratories, and many are in-house developed. Some are general-purpose; many are specific to the HEP community. If the division supports the product you need, and if licensing allows for distribution to your computer, you can arrange to have it installed.

Hardware Support. The Distributed Computing Hardware Group in the Distributed Computing Department provides hardware support for distributed workgroup computing.

Online and Data Acquisition Support

Online and data acquisition support for experiments covers maintenance and repair of electronics, computer hardware and software installation and support, and development and support of specific hardware and software components, as set forth in the MOU.

The division also serves as a resource of knowledge and expertise for experimenters as they commission their data acquisition and online systems. Many groups in the Computing Division offer outstanding services; you can reach all of them through your experiment's online liaison.

Equipment Maintenance. If the MOU provides for it, Fermilab maintains both instruments and computer systems. Users usually carry malfunctioning instruments into the PREP issue window for exchange and repair by the Online Equipment Support Group.

Computer maintenance usually comes from the Computing Division, via the Distributed Computing Department's Distributed Hardware Group, an outside contractor, the Online Data Acquisition Hardware group or the Online In-house Computer Maintenance group. You can call a centralized 24-hour computer trouble line at ext. 4373. During accelerator running times, you can get after-hours support as well.

You can get hardware consultation services in support of CAMAC, NIM and FASTBUS devices via the Online Data Acquisition Hardware Group.

Software Installation. Experimenters should make sure to request appropriate software tools and licenses in the MOU. The experiment has the responsibility to ensure that all necessary software licenses are registered with the Computing Division's license coordinator, to meet all legal obligations. Backing up the online liaison, software consultants can help with software and systems areas that the division supports.

Software and System Support. The MOU spells out agreements for software support. The experiment liaison then serves as a channel for this support. The division provides consultation on most software and systems-level products. Experiment representatives usually handle systems management. The extensive networking throughout the laboratory makes most services available via mail utilities or direct contact with the responsible groups.

Passwords

Common sense in choosing and protecting passwords can prevent many hacker penetrations to Fermilab computers. For example:

- Don't make your password easy to guess—not the same as the username; not personal information, even backwards; not dictionary words; and especially not no password.
- Use at least six alphanumeric characters. Passphrases are fine, especially if deliberatly misspeled, but remember most UNIX systems only use the first eight characters.
- Don't put passwords in files.
- Change your password frequently—at least twice annually—and don't change it back to a previously used password.
- Don't give your password to someone else. If you find that someone knows it, change it immediately.

Responsibilities of Those Using Fermilab Computers

Proper Computer Usage. Lab policy on appropriate computer use and a summary of guidelines is given in Chapter 2 of this publication. The up-to-date lab policy is available on the Internet at *http://www.fnal.gov/cd/main/policies.html*

Data Integrity. All files containing data or programs that affect the success of the high-energy physics program must have protection against loss or improper manipulation. All users should take precautions to enhance the probability of data recovery in case of unanticipated loss or alteration of their data. Central systems are backed up by the Computing Division; users of PCs or local systems should make sure they understand the backup strategy for their systems.

Care should be taken not to introduce viruses and other such malicious software onto Fermilab computers. Software should only be downloaded from reliable sites. The PC Support Department in the Computing Division can suggest appropriate virus protection tools.

Certain types of data, including some personnel data, proprietary data, financial, procurement and inventory data, may have special confidentiality requirements and require special treatment. Before assembling or accessing such data, consult the CPPM to determine if such special treatment is necessary.

Licensed Software. Computer users at Fermilab often make use of licensed or proprietary software. Most of this software carries with it explicit—sometimes implicit—legal restrictions for its use. In general, if the software is on the system in libraries supported by the Computing Division and you

use it in the advertised way, its use on that local system is unrestricted. You should assume that you may not make or take a copy away with you unless you have permission from the maintainer of the program, who should understand any restrictions. Most software now has legal protection under patent or copyright law. Employees and users are expected to honor the terms of all licenses (see Chapter 2).

Users' Responsibilities. Fermilab employees, visitors, and guest users may use the computer systems in support of the high energy physics program. We ask users to refrain from actions that may interfere with use of computers by others. Don't share your computer accounts—you are responsible for any use that others make of them. Application for and assignment of a Fermilab computer account carries with it acceptance of the responsibilities and rules described in Chapter 2 of this publication.

Non-Fermilab-Owned Machines. You may connect computers not owned by Fermilab to the Fermilab network only with explicit permission from the Computing Division. Once you connect such a computer to any Fermilab-owned machine or local network, it is bound by all rules and policies that apply to Fermilab-owned computers described in Chapter 2. This applies to any computer connecting to Fermilab computing over a wide-area network or over phone lines for the duration of the connection. Fermilab has the right to monitor the use of the computer. Special restrictions concerning the use of licensed or proprietary software may apply to these computers. If such machines are removed from the Fermilab site, any Fermilab - provided licensed or proprietary software should be removed from the computer.

Life at Fermilab

CHAPTER 8

Experimenters come to Fermilab for a few days—or a few years. While they're here, Fermilab provides services—from help in finding a place to live to making travel arrangements.

The Users' Office, Resource for Experimenters

When an experimenter comes to Fermilab, the Users' Office WH1W, (ext. 3111) performs the introductions between user and laboratory, handles registration and ID cards, and gives new users information about laboratory policies, procedures and facilities. Throughout the experimenter's stay, the Users' Office provides information and responds to questions and concerns. The staff takes telephone messages and accepts mail for users who don't have another point of contact in the laboratory, maintains a copy machine for users and provides secretarial and administrative support to the Users' Executive Committee.

Personal Help for You and Your Family

Newcomers to Fermilab can get general information, school information, maps and other materials from the Users' Office WH1W (ext. 3111). The Users' Office will be glad to send you the Certificate of Child Health Examination form, required by the state of Illinois for all children entering local schools. Your child's doctor should complete this form just before your departure for Fermilab. The West Chicago school district provides free bus transportation for children who live on the Fermilab site.

> ***The first users: "In the Woodland period, from 2,500 B.C. - 500 A.D., visits to the Fermilab site were brief; hunting and gathering nuts and berries were main activities. Afterwards the Indians would return to their more permanent settlements along the banks of the larger rivers."***
>
> From a history of the Fermilab site by Adrienne Kolb

Fermilab has an electronic gate system to control access to the site. Access procedures are explained in Chapter 3. You may contact the Key and ID Office (WHGNX) at extension 4506 to find out the most convenient access method for family members living on site and for social visitors.

We encourage foreign visitors to request Fermilab's *Guide for Foreign Visitors*. It informs you about health insurance, social security cards, drivers' licenses and other things you need to know before you arrive. The Users' Office will be glad to send it.

NALWO (an organization open to all women affiliated with Fermilab) sponsors English classes when possible. The classes are free of charge and may be joined at any time. Information about the times and place is available from the Users' Office.

Once a week, morning coffee hours sponsored by NALWO provide an opportunity for spouses of experimenters to meet and get acquainted.

A Place to Live

Fermilab's Housing Office (ext. 3777) in the lobby of Aspen East at the corner of Sauk Boulevard and Batavia Road in the Fermilab Village helps experimenters and their families find housing while they are at the laboratory. The Housing Office compiles an annual brochure, *Apartment and Townhouse Information*; most of the apartment complexes it lists offer one-year leases. The staff also maintains a book of privately owned properties for rent or lease. The Housing Office staff is glad to help you find off-site housing, but you make contractual arrangements directly with the landlord.

Living On Site

Facilities. Fermilab has furnished houses, apartments and dormitory rooms on site for users to rent. You can purchase weekly maid service (required in houses and apartments with more than one experimenter) at an additional charge. Dormitories have lounges and kitchens; the dormitory room charge includes weekly maid service.

Reservations. The Laboratory makes housing assignments based on individual needs and the best interests of the laboratory program. The Housing Office maintains a current reservation list. You may sign up for housing at any time.

The Housing Office needs to know the names of all tenants in each unit at all times. When an experiment group rents a house, apartment or dormitory rooms, the Housing Office needs to know as each new guest arrives or departs. Please update the name card on the door to show the current occupants and report the changes to the Housing Office.

For on-site repairs, services and housing complaints, call ext. 3777, the Housing Office. For emergency repairs after working hours, call the switchboard operator, who will make arrangements for service.

Cancellations. The Housing Office must receive cancellations two weeks before the scheduled arrival date or a fee equal to two weeks' rent will be charged.

Rental Payment. You can pay your rent by budget code, cash, personal or travelers check, Visa or MasterCard.

Registering and Check-Out. You may pick up keys in the Housing Office, Monday through Friday, 8:00 a.m.- 4:30 p.m. At other times, please pick up your keys from the Communications Center, WHGNX.

Check-out time is 10:00 a.m. in houses and apartments, 1:00 p.m. in dormitory rooms. Please turn in keys to the Housing Office at Aspen East or to the Communications Center, WHGNX. Late check-out means an extra charge of one day's rent.

Pets. We allow pets in houses and apartments, but not in dormitory rooms. Before you bring a pet into a housing unit, you must sign a statement in the Housing Office that the pet's owner will take responsibility for keeping the animal "under control." If the pet is a dog, the owner must produce a valid license and a recent rabies vaccination certificate. Pet owners are liable for any damage or injury their pets cause. Failing to notify the Housing Office about the presence of a pet may result in the denial of housing accommodations.

Telephone calls. All units have private telephones. You must charge long-distance and toll calls to a credit card, or make them collect. Place overseas calls through the Fermilab operator. The operator will require a budget code and other information for chargeback. The Fermilab operator will obtain time and charges for personal calls, for which callers pay the laboratory cashier, WH4E. There is a pay telephone located at 18 Sauk Blvd.

Laundry and linen. Laundry facilities are located at 18 Sauk Blvd., the basement of Aspen East and 10 Sauk Circle basement. All house and apartment residents receive clean rental linen once a week.

Mail

Support Services staff pick up and deliver mail twice daily in Wilson Hall, Cross Gallery and Neutron Therapy. Other buildings have morning delivery and pickup only. Village resident mailboxes are located at 18 Sauk in the Village. In extreme cases of inclement weather, Village mail may not be delivered.

You can arrange for overnight business mail (Express Mail) through the mailroom at Site 38 WHSE II.

Tornado Shelters

In case of a tornado, take shelter. Shelter areas are located in the Village at the following addresses: Aspen East (Batavia and Sauk Blvd.), Dorm 3 (1 Shabbona), Proto-Booster (Neuqua and Potawatomi), Shelter 20 (next to the Day Care Center) and 14 Sauk Circle. Find out exactly where you should go in case of a tornado the day that you arrive in the Village—don't wait until an emergency happens.

Express Mail leaves Fermilab at 2:15 daily to guarantee delivery the next morning. The mailroom delivers incoming Express Mail directly to the mail station. The mailroom is open weekdays from 7:00 a.m. - 3:50 p.m. No personal packages will be accepted. Stamps may be purchased from a stamp machine located near the Credit Union on the ground floor of Wilson Hall.

Phone

The laboratory's main telephone number is (630) 840-3000. For incoming FTS calls, the laboratory's FTS number is also (630) 840-3000. Callers can reach users and employees directly by dialing (630) 840- and the four digit extension number. Within the laboratory, the four digit extension number suffices to place calls.

To avoid expensive calls from pay phones, callers can reach Fermilab from Chicago, including O'Hare airport, by dialing 326-5533 and asking the Fermilab operator for the desired extension.

Place all outgoing international calls through the Fermilab operator. For business calls, the operator will require a budget code and other pertinent information for chargeback. The Fermilab operator will obtain time and charges for personal calls, for which callers pay the laboratory cashier, WH4E.

The laboratory's main facsimile number is 4343. Other facsimile numbers are listed in the Fermilab telephone directory.

To request telephone installations, including voice mail, submit a Telephone Service Request Form (available from most secretaries) to Telecommunications, MS 228. These forms require signature approval from the appropriate department head. Phone installations require three weeks advance notice and a user account code.

Users may borrow pagers from the Telecommunications Office, WH5W, (ext. 3788).

Medical Care

Emergencies. In an emergency, dial 3131. Fermilab has staff and equipment to provide emergency medical service 24 hours a day, 365 days a year. Anyone seriously injured is taken immediately to a community hospital for emergency care.

Urgent care. The Medical Office, WHGNW (ext. 3232) is staffed by registered nurses on weekdays from 7:00 a.m. to 5:00 p.m. A physician is on the site weekdays between 8:00 a.m. to 12:00 noon and 1:00 p.m to 5:00 pm. Should you need immediate medical care when the Medical Office is closed, go directly to the Emergency Room (phone 859-2222) at Mercy Center Hospital, 1325 Highland, Aurora, just south of the E-W Tollway on Route 31.

> *"The labor we delight in physics pain."*
>
> Shakespeare, in Macbeth

Routine care. Users should consult health care providers in the community for non-emergency medical care. Users must show they have medical insurance coverage while they are at Fermilab. Users will be billed by the provider for any medical services not covered under their regular health insurance plan.

Pharmacies in the United States require prescriptions for the purchase of most drugs. Eyeglasses require prescriptions as well.

Food Service

The cafeteria on the first floor of Wilson Hall serves breakfast, lunch, and afternoon snacks Monday through Friday, and breakfast and lunch on Saturday. There is usually no service Sundays and holidays. Hours are posted near the cashier. Call Food Services (ext. 3646) to make arrangements for special events.

You'll find vending machines in the southwest corner of the first floor in Wilson Hall, in the Cross Gallery of the Accelerator, the Meson laboratory, and at 18 Sauk Blvd. in the Village. Report problems with vending machines to Food Services (ext. 3646).

Day Care

Fermilab operates an infant and day care facility, the Children's Center, at 34 Shabbona in the Village. The infant care section for children six weeks to three years has infant, pre-toddler and toddler sections. The day care section cares for children three to six years of age. Hours are 6:45 a.m. to 5:30 p.m. with full-day and half-day programs. Enrollment is based on availability and a waiting list is maintained. For information regarding costs, etc., call the Accommodations Office (ext. 3082) or the Children's Center (ext. 3762).

Fermilab has three, three-week sessions (full or half days) of summer day camp for experimenters' and employees' children from seven to 12 years old. Reservations are required. If there are more applicants than space available, selection is made by lottery. Call ext. 3126 for information.

Travel and Transportation

Reservations. The Fermilab Travel Office, WH1W, (ext. 3397) makes reservations for air travel, car rental, hotels and limousine service. You can

pay for travel by personal check, cash or charging to a budget code. Limousine companies in the Fermilab area will not accept reservations charged against a Fermilab budget code without prior approval from the Travel Office.

On-Site Transportation. The Fermilab taxi provides transportation on site from 8:00 a.m. to 4:30 p.m. on weekdays. To call the taxi, dial ext. 4225 (HACK).

Off-Site Transportation. No public transportation serves the laboratory site, but the Travel Office has information about the quickest and least expensive transportation in the area. The Travel Office will help you make arrangements for transportation to O'Hare International Airport.

Rental & Lease Cars. Commercial rental and lease cars at special rates are available to users on site. Call the Users' Office (ext. 3111) for information and reservations.

Government Vehicles. Government vehicles are available from the General Services Administration, Chicago Fleet Management Center, 4100 West 76th Street, Chicago, Illinois 60652. Users supported under a federal contract may be authorized to use them. Cars must be picked up and returned to the Chicago street address. Requests for these vehicles must be made prior to pickup, via the user's home institution.

Personal Vehicle Insurance Requirement. The State of Illinois has a mandatory insurance law that requires drivers to have insurance on their personal vehicles. Users have the responsibility to make sure their vehicles are insured.

Are We Having Fun Yet?

Recreational Facilities. The Users' Center, at 10 Che Che Pinqua in the Fermilab Village, is open Monday through Friday from 5:00 p.m. until midnight. The Center has a bar, ping pong and pool tables, shuffleboard, cards, chess and checkers. You'll also find a color television set and VCR, a grand piano and a small library. Children must have responsible adult supervision.

Chez Leon, a gourmet restaurant in the Users' Center, serves two meals each week: lunch on Wednesdays between 11:30 a.m.. and 1:00 P.M. and dinners on Thursdays at 7:00 p.m. (for between 30 and 55 guests). You'll find the upcoming menu in the FermiNews or at *http://www.fnal.gov/faw/events/menus.html* Make reservations (they're required) by calling ext. 4512.

The Recreation Facility, at 16 Potowatomi, includes a multipurpose gymnasium, an exercise room, a fully-equipped weight room and locker rooms, with 24-hour access for members. Memberships can be purchased in the Recreation Office, WH15W, (ext. 2548).

The swimming pool, open Memorial Day through Labor Day, is available through the purchase of a season pass or by paying a daily fee. Children's swim lessons are also available. Membership to the pool and registration for swim lessons can be arranged through the Recreation Office, WH15W.

Three tennis courts, a basketball court, soccer field, softball diamond and two sand volleyball courts are available adjacent to the Village Barn. Located in the upper level of Anderson Barn, just off Sauk Circle, is a combination squash and racquetball court.

You can also rent a canoe for a nominal cost for use on or off-site.

The Recreation Office brochure has information about all these recreation facilities and programs, clubs and leagues. For more information regarding Recreation, contact the Recreation Office, WH15W at ext. 2548, or at *http://fnalpubs.fnal.gov/benedept/welcome.html*

Cultural Activities. Fermilab sponsors many cultural activities in the 830-seat Norman F. Ramsey Auditorium at the south end of Wilson Hall.

The Fermilab Arts Series features monthly Saturday evening performances of internationally acclaimed dance, theater, comedy, chamber music, jazz and folk music ensembles. In the Lecture Series, Fermilab hosts distinguished guests from many disciplines. You can obtain information and tickets at the reception desk in the atrium of Wilson Hall, or look at the web page at *www.fnal.gov/culture*

Fermilab's International Film Society offers international, feature and documentary films, usually on the second and fourth Fridays of each month. You don't need to make reservations or buy tickets in advance, but there is a nominal charge at the door.

The Art Gallery on the second floor of Wilson Hall offers bimonthly exhibits of paintings, photographs and sculpture, ranging from high-tech to ethnic. Fermilab invites the public to view these lively and varied exhibits seven days a week, during daytime hours.

FAX (Fermilab Acronyms for Experimenters)

AAL
Activation Analysis Laboratory of the ES&H Section

ADIT
Associate Director for Information and Technology

ANSI
American National Standards Institute

BD
Beams Division

BSS
Business Services Section

CD
Computing Division

CDF
Collider Detector at Fermilab

CH
DOE Field Office, Chicago

CMS
Compact Muon Solenoid

CPPM
Computer Protection Program Manager

D0
Collider Detector at DZero interaction region

DOE
U.S. Department of Energy

EPO
Environmental Protection Officer

ES&H
Environment, Safety and Health

FCIRT
Fermilab Computer Incident Response Team

FESS
Facilities Engineering Services Section

FN
Physics Notes, Fermilab physics papers for limited distribution

FNAL
Fermi National Accelerator Laboratory

FTS
Federal Telephone System

G&A
General and Administrative costs

GeV
Giga Electron Volt

HEP
High Energy Physics

HVAC
Heating, Ventilating and Air Conditioning

ID
Fermilab Identification Card

LSS
Laboratory Services Section

MDL
Material Development Laboratory

MOU
Memorandum of Understanding

MS
Mail Station

MSDS
Material Safety Data Sheet

NALWO
National Accelerator Laboratory Women's Organization

NFPA
National Fire Protection Association

ODH
Oxygen Deficiency Hazard

ORC
Operational Readiness Clearance from Particle Physics Division

OSHA
Occupational Safety and Health Administration

PAC
Program Advisory Committee

PPD
Particle Physics Division

PPE
Personal Protective Equipment

RSO
Radiation Safety Officer

SAD
Safety Assessment Document

SSO
Senior Safety Officer

T&M
Time and Materials contracts

TD
Technical Division

TeV
Trillion Electron Volts

TM
Technical Memo, internal Fermilab technical document

UEC
Users' Executive Committee

URA
Universities Research Association, Inc.

WH7NE
Northeast corner of seventh floor of Wilson Hall. Other floors correspondingly indicated, as WH6W, Wilson Hall sixth floor west.

WH8NX
Wilson Hall eighth floor north crossover. Other crossovers correspondingly indicated, as WH2SX Wilson Hall second floor south crossover.

WHGNW
Wilson Hall Ground Floor Northwest. The ground floor is beneath the first floor and is sometimes called the basement.

WHSE II
Warehouse #2 at Site 38

User's Survival List

Airline Tickets	Travel Office, WH1W, ext. 3397, e-mail: *travel@FNAL.gov*
Cafeteria	WH1SX. The cafeteria on the first floor of Wilson Hall serves breakfast, lunch and snacks, Monday through Friday, and breakfast and lunch on Saturday. There is usually no service on Sundays and holidays. Hours are posted near the cashier.
Car Rental	Users Office, WH1W, ext. 3111.
Cashier	WH4E (just outside East elevator), ext. 5808, Mon.-Fri., 12:30-4:15 p.m. Personal checks to $200 with Fermilab ID.
CERN Courier	Sign up for mailing list in Users' Office or Public Affairs Office.
Chez Leon Dining	Users' Center, Wednesday lunch 11:30 - 1:00, Thursday dinner 7:00 p.m. By reservation only (ext. 4512). Menus listed: *http://www.fnal.gov/faw/events/menus.html*
Computer Accounts	WH8NX, ext. 8118, e-mail: *compdiv@fnal.gov*, *http://www.fnal.gov/cd/main/forms.html*
Copying	Duplicating WHGN, Users' Office WH1W, or Library, WH3SX.
Cultural Activities	Program announcements and tickets, Atrium Reception Desk, WH1NX, ext. 3353, *http://www.fnal.gov*
Day Care	28 Shabbona, for information - ext. 3762 or 3082.
E-Mail Accounts	WH8NX, ext. 8118, e-mail: *compdiv@fnal.gov*
E-Mail Addresses	To find telephone numbers or email addresses, *http://www-tele.fnal.gov/telephone/*
EMERGENCY	**Call 3131. Fire, Ambulance, Security. Stay on line to answer questions.**
Environment, Safety and Health Manual	ES&H Section, WH7E, *http://www-esh.fnal.gov:8001/FESHM*
Fax	Communications Center, WHGNX, (630) 840-4343. Check Fermilab Phone Book for other Fax numbers.
Ferminews	Public Affairs Office, WH1E, ext. 3351, *ferminews@fnal.gov* Newsletter published every other week.
FIRE	**Call 3131. Stay on line to answer questions.**
Gate Passes	Obtain passes through Keys and ID Office, WHGNX.
Gym Membership	Includes pool and gym memberships, leagues, clubs, etc. Recreation Office, WH15W, ext. 2548 or 5427, *http://fnalpubs.fnal.gov/benedept/welcome.html*
Housing Information	Aspen East in Village, ext. 3777, e-mail: *housing@fnal.gov*

ID Cards	Required for all experimenters, obtained through Users' Office, WH1W.
Key Requests	Key requests must go through the appropriate divison or section office. Keys and ID Office, WHGNX, ext. 4506.
Library	WH3SX, ext. 3401, e-mail: *library@fnal.gov, http://www-lib.fnal.gov/library/welcome.html*
Lost and Found	Communications Center, WHGNX, ext. 3000.
Mailing Lists	Users' Office, WH1W, ext. 3111.
Mailroom	Warehouse #2, Site 38, by Shipping and Receiving, ext. 3210. Open for Lab business Mon.-Fri., 7:30 a.m.-4:00 p.m. No personal packages. Also see "Stamps."
Maps	Users' Office, WH1W, ext. 3111.
Medical Clinic	WHGNW, ext. 3232.
MEDICAL EMERGENCY	**Call 3131. Stay on line to answer questions.**
Notary Public	Argonne Credit Union, WH1W, ext. 3293.
Pager	Dial 72, wait for tone, dial pager number, wait for 3 beeps, give message.
Pay Phones	WH1E, WH1W, WHGSW. Other pay phones in Fermilab Phone Book.
Post Cards	Fermilab post cards, books and posters for sale. Public Affairs Office, WH1E, ext. 3351.
Personnel Policy Guide	*http://fnalpubs.fnal.gov/policyguide/cover.html*
Publications	Publications Office, WH15SW, ext. 3278, e-mail: *techpubs@fnal.gov, http://www-pubs.fnal.gov/*
Radiological Control Manual	ES&H Section, WH7E, *http://www-esh.fnal.gov:8001/FRCM/*
Recreation Membership	Recreation includes pool and gym memberships, leagues, clubs, etc. Recreation Office, WH15W, ext. 2548 or 5427, *http://fnalpubs.fnal.gov/benedept/welcome.html*
Residence ID	For identification of users' family members. Housing Office, Aspen East, ext. 3777.
Social Security	Applications and maps in Users' Office, WH1W, ext. 3111; Call 1-800-234-5772 for information.
Stamps	Stamp machine, WHGW, near the Credit Union.
Stockrooms	Site 38, Warehouse #1, ext. 3825, Mon.-Fri., 8:00 a.m.-11:45 a.m., and 12:30-4:30 p.m.
Taxi	Call HACK (ext. 4225), 7:30 a.m.-4:30 p.m. weekdays, on-site transportation only.
Telephone Numbers	Telephone numbers or email addresses, *http://www-tele.fnal.gov/telephone/*

Telex	Communications Center, WHGNX, Telex number 373-6609.
Tickets, Events	Atrium reception desk, WH1NX, ext. 3353, 8:30 a.m. - 12:00, and 1:00 - 4:00 p.m.
T-shirts	Atrium reception desk, WH1NX, ext. 3353.
Tours	Atrium desk (WH1NX) has information for self-guided tours. The Education Office, ext. 5588, makes reservations for and conducts guided tours.
Travel	Travel Office, WH1W, ext. 3397, e-mail: *travel@fnal.gov*
Users' Center	10 Che Che Pinqua, Village; Mon. - Fri. —5:00 p.m. - midnight. Bar, snacks, recreation are available.
Users' Office	The Users' Office is the best reource for experimenters for Fermilab information. WH1W, ext. 3111, e-mail: *usersoffice@fnal.gov*
Vehicle Stickers	Keys and ID Office, WHGNX, ext. 4506.
Weekend Services	Communications Center, WHGNX, ext. 3000. Dispenses pre-arranged housing contracts, airline tickets; dispatches Security to handle *emergency* stockroom withdrawals, PREP exchange/withdrawal, housing lockouts, library keys, and *emergency* on-site transportation.
Yellow Pages	Fermilab Telephone Directory, or *http://www-tele.fnal.gov/telephone/yellow/yellow.html*

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Fermilab Warning Signals

IN ANY EMERGENCY, CALL 3131.

If you are indoors and you hear:

Steady Alarm
Fire
Evacuate according to plan.
Assemble at designated assembly point.

Intermittent Alarm
Tornado
Go to shelter, according to plan.

Whooper Horn.
Radiation or hazardous atmosphere
Evacuate immediately, according to plan.

If you are outdoors and you hear:

Steady Siren*
Tornado
Go to shelter, according to plan.

If you don't have time to reach a designated shelter, seek shelter from a tornado in the nearest ditch or natural depression in the ground.

*Fermilab tests the Tornado siren at 10:00 a.m. on the first Tuesday of every month.

"According to Plan"
Wherever you work—in whatever part of Fermilab—you need to learn the plan for evacuation in case of fire or other hazards, and the plan for seeking shelter from a tornado. Ask your division's Environment, Safety and Health staff for this important information.