

**APS User Safety Guide:**  
*A reference for work at the APS*

Advanced  
Photon Source

Argonne National  
Laboratory



October 1995

## In Any Emergency – Dial 911

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In any emergency at the APS, dial 911 and stay on the line until instructed to hang up. When asked about your location, look at the 911 sticker on the phone you are using: the building and room number are listed there. To report an emergency from a non-ANL location, dial 252-1911; from a cellular telephone, dial 1-708-252-1911. Call even if you aren't sure it's necessary; you will not be criticized. After calling, notify your CAT Manager and your APS Floor Coordinator.

## Acronyms

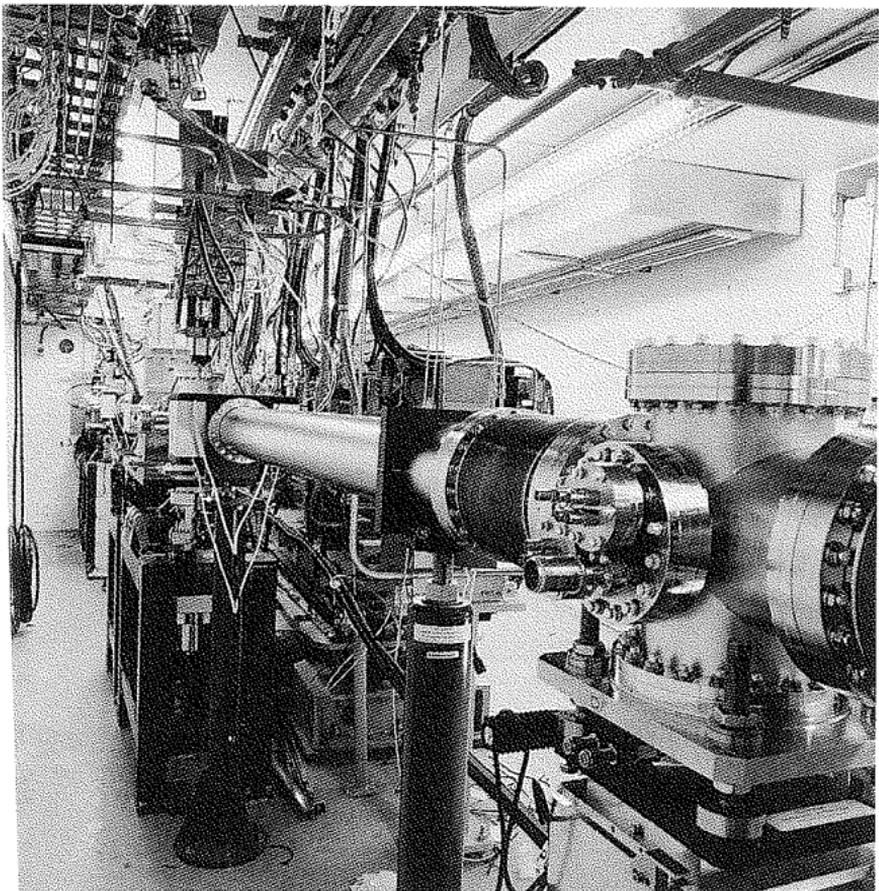
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AMOS	Argonne Materials Ordering System
ANL	Argonne National Laboratory
ANSI	American National Standards Institute
APS	Advanced Photon Source
CAT	Collaborative Access Team
CLO	central laboratory/office (building)
CPR	cardiopulmonary resuscitation
DOT	U.S. Department of Transportation
ES&H	environment, safety, and health
GFCI	ground fault circuit interrupter
LOM	laboratory/office module
MSDS	material safety data sheet
NFPA	National Fire Protection Association
PPE	personal protective equipment
XFD	Experimental Facilities Division

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## Foreword

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It is the goal of the APS to create and maintain a safe and ecologically sound research environment for its users. The APS will take all reasonable measures to protect the health and ensure the safety of APS users and visitors, ANL personnel, and the public, and to prevent accidental damage to property and the environment. Facility operations will never be given a higher priority than the safety of individuals.

To achieve this goal, all users, and all individuals conducting activities at the APS under the auspices of users, are expected to comply with the environment, safety, and health (ES&H) policies and practices described in this guide and in the APS-approved ES&H plans of their Collaborative Access Teams (CATs). In cases of noncompliance, the APS may, at its discretion, shut down user facilities or exclude individuals from experimental areas.

Each CAT is responsible for providing orientation and training for those using its facilities. This “sector orientation” will include an explanation of any potential hazards and necessary precautions in the CAT’s work area. It will also include information on what procedures to use and how to obtain appropriate protective items.

The APS welcomes your questions about the safety practices described in this guide and your suggestions for improvement or for new material to be included in future editions. Call or write the Office of the Experimental Facilities Division (XFD) ES&H Coordinator. Contact information for APS safety personnel is given in the directory on page 28.

## Note on Position Titles

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The “CAT Manager” is the person with the primary day-to-day responsibility for maintaining safe conditions in all spaces occupied by your Collaborative Access Team. You should be introduced to this person during the sector orientation provided by your CAT. Your host CAT may use a different title, such as Beamline Manager, Project Manager, or Sector Coordinator.

The “CAT Safety Coordinator” is the person who serves as the CAT’s primary contact with the APS on environment, safety, and health (ES&H) issues. He or she works closely with the CAT Manager to ensure that CAT staff and users complete required training and work in a safe manner. You should be introduced to this person during your sector orientation. Your host CAT may use a different title, such as Safety Officer or Safety Representative.

Your CAT may also have assigned specific safety responsibilities to other individuals designated as Electrical Safety Coordinator, Chemical Safety Coordinator, Machine Custodian, etc. You will be given this information during your sector orientation.

APS Floor Coordinators are assigned to specific laboratory/office modules (LOMs) to provide operational support for the CAT beamlines in the corresponding sectors. This support includes a number of safety-related functions, as described throughout this guide. The Floor Coordinators are members of the User Technical Interface Group within the Experimental Facilities Division (XFD) of the APS.

The XFD ES&H Coordinator provides primary safety oversight of CAT facilities at the APS.

# 1

## Give Safety a High Priority

Working safely at the APS is everyone's responsibility. Do not start any job until you know how to do it safely, and never take a shortcut or modify an operating procedure without proper approval. When in doubt about the safest course of action, **don't guess** – consult this safety guide or ask your CAT Safety Coordinator.

### 1.1

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#### Safe Work Practices

##### **Before You Begin Work**

Become familiar with the work area, including the locations of tornado shelters, emergency exits, and available communications equipment.

Know the “dial 911” emergency procedures (see the inside front cover and Section 1.3).

Determine whether you will need to control access to your work area (see Section 2.3).

Make sure your equipment and tools are in safe working condition (see Section 4).

Wear proper clothing and protective equipment (see Section 2.1).

Know how to reach the APS Floor Coordinator for your sector (see the directory on page 28).

Review applicable procedures.

## After You Finish

Leave the work area clean, orderly, and free of debris.

Remove any signs, barricades, or other warning devices that are no longer needed.

## 1.2

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### Stop-Work Authority

Both your CAT and the APS, as well as other ANL personnel with safety responsibilities, have the authority to stop any CAT-related activity that in their judgment poses a clear and present threat to health and safety. This authority includes the right to require a safety review of any task to assure that all appropriate hazard controls are in place before the task is performed.

If you notice a serious safety problem in your work area, ***stop working immediately***. Secure your equipment and cordon off the work area, and then contact your CAT Safety Coordinator. Similarly, if you see anyone working at the APS under conditions that appear unsafe, warn the individual and report your observations to the appropriate supervisor or Safety Coordinator. If the Safety Coordinator is unavailable or if the situation could affect activities outside your sector, notify an APS Floor Coordinator immediately.

## 1.3

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### Reporting Accidents

If you witness an accident that results in any emergency situation (personal injury or illness, fire, explosion, release of toxic materials, etc.), follow the "dial 911" procedure on the inside front cover of this guide. If you witness a "near miss," immediately report it to your CAT Manager. If your Manager cannot be located, notify an APS Floor Coordinator.

If an accident investigation follows, please cooperate fully; such investigations are an important tool for preventing recurrences.

## 2

# Protecting Yourself and Others

## 2.1

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### Personal Protective Equipment

Wear only personal protective equipment (PPE) that has been approved for your task. Inspect the equipment for defects before each use. Consult your CAT Safety Coordinator if you think that the equipment may not properly protect you. After completing the task, store reusable equipment in the storage facility your CAT has designated.

#### **Eye and Face Protection**

Wear safety eyewear in posted areas and when your activities pose a risk of eye injury. The eyewear you choose must meet the requirements of the ANSI Z87.1 standard. To obtain prescription safety glasses, consult your CAT Safety Coordinator. Plano (noncorrective) safety glasses are available from the APS stockroom.

Wear a face shield for protection from corrosive or cryogenic liquids, small flying particles produced by grinding, drilling, or cutting tools, or any other material that could endanger your face. Always wear safety glasses (or goggles, if working with liquids) beneath the shield. Face shields and goggles are available from the APS stockroom.

#### **Foot Protection**

Wear safety footwear in posted areas and when your activities pose a moderate or greater risk of foot injury. Safety footwear must meet the requirements of the ANSI Z41 standard.

#### **Skin Protection**

Wear gloves and an apron when working with materials that are hazardous to your skin, such as corrosive liquids and organic solvents. Your CAT Safety Coordinator or Chemical

Safety Coordinator can help you identify suitable protective equipment.

### **Electrical Shock Protection**

Consult with your CAT Safety Coordinator or Electrical Safety Coordinator about the kind of protective equipment you may need when working on electrical equipment.

### **Fall Protection**

If you are working 6 feet (2 meters) or more above floor level at a location where there are no guard rails or other installed fall protection, you must use a fall-arrest system (e.g., a body harness and secured lanyard). Discuss needed protection with your CAT Safety Coordinator.

### **Other Personal Protective Equipment**

If you anticipate needing respiratory or hearing protection or other types of protective equipment not covered above, contact the XFD ES&H Coordinator at extension 2-9394.

## 2.2

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### Construction Areas

Certain areas of buildings at the APS may occasionally be posted as construction or installation areas. Enter such areas only with specific authorization and only if wearing proper clothing. In construction areas, you must wear a hard hat, safety glasses with side shields, a shirt with sleeves (short sleeves are acceptable), long pants, and sturdy leather safety shoes that cover the ankle (the APS recommends shoes that also protect against sole penetration). Skirts or shorts are not allowed. Specific requirements for beamline installation areas will be posted. You must comply with all posted instructions, barriers, and signs.

## 2.3

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### Work Area Barricades and Warnings

When your work could put others at risk, you must create an exclusion zone around your work area. This is typically



a one-time exception to this rule for a specialized task, consult your APS Floor Coordinator when planning the work.

## 2.6

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### Configuration Changes

Any planned action that could affect the performance of an existing engineered hazard control must be reviewed, approved in advance, and properly recorded by the CAT and by the APS, as noted below. Similar requirements apply to changes in the distribution of utilities (electricity, fluids, and ventilation), the installation of temporary experimental facilities and equipment, and the startup of previously unreviewed systems and activities that could introduce new hazards.

No shielding or personnel safety system installed by the APS or included in an APS-approved configuration may be modified, removed, or disabled and no equipment, system, or apparatus may be operated outside of its designed safety parameters without a formal review by the applicable XFD safety committees and the written approval of the XFD Associate Division Director for Operations.

## 2.7

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### Housekeeping

#### **Work Areas and Common Areas**

Keep your work area neat and orderly. Promptly dispose of used packing materials and other potential fire hazards. Keep walkways unobstructed and wipe up spills.

If you observe that a piece of equipment has a frayed electrical cord or other damage, take it out of service by removing it or labeling it as damaged or unsafe.

When appropriate, post warning signs to alert others to potential hazards.

## Storage Areas

Keep storage areas clean and organized: store tools and equipment in designated spaces, and segregate incompatible substances.

Properly label flammable and other hazardous materials and store them only in the locations specified during your sector orientation.

## Emergency Equipment

Keep safety equipment (e.g., fire extinguishers) readily accessible at all times.

Never allow fire lanes, emergency doors, or corridors to be blocked by equipment or materials.

Make sure warning signs and labels are legible and unobstructed at all times.

## 2.8

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### Ladders

Keep ladders free from dirt or grease that might conceal defects.

Examine ladders before each use; don't use them if they have any defects.

When using a stepladder, be sure it is fully open before starting to climb.

Don't leave a ladder unattended while it is set up, unless it is tied off at both top and bottom.

Never use a metal ladder where it could come into contact with electrical circuits or energy sources. Use wood or fiberglass ladders instead.

Use fall-arrest equipment (e.g., a safety harness) if you will be working from a ladder rung that is 6 feet (2 meters) or more above floor level.

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## Lockout/Tagout Procedures

The lockout/tagout guidance given below outlines the process for disengaging a piece of equipment from its source of energy and preventing reactivation while work on the equipment is under way. Your CAT should have a more detailed procedure in place for each specific energy source you may need to lock out (e.g., electricity).

Never attempt to start, energize, or use equipment that is locked out of service, and never attempt to defeat a lock or remove a tag without authorization.

### To Initiate Lockout/Tagout

1. Identify all energy sources involved and all switches or other energy-isolating devices that control the energy sources.
2. Notify your CAT Safety Coordinator, your APS Floor Coordinator, and affected personnel about the lockout. This notification can be verbal.
3. Verify that the controls on the equipment itself have been placed in the "off" position.
4. Disengage all energy sources and verify with an appropriate test instrument that power has been turned off.
5. Place locks on the energy-isolating devices controlling the energy sources. (Each person working on the equipment places his/her own lock on each device.) Use only approved locks obtained from one of the lockout/tagout stations located throughout the APS. Register each lock and tag removed from the station in the station logbook and fill out the information required by the lockout tag. Each worker then keeps the keys to his/her locks until the locks are removed.
6. Dissipate all stored energy where possible. Use an appropriate test instrument to verify that the energy has been dissipated.
7. Prior to starting work on equipment that has been locked out, all workers should verify collectively that the equipment is isolated from all energy sources and is de-energized.

## To End Lockout/Tagout

1. Remove all locks and tags. (Each individual removes the lock and tag he/she applied. If a person who participated in the lockout/tagout is unavailable, contact his/her supervisor, your Safety Coordinator, or your APS Floor Coordinator.)
2. Notify all affected individuals, including your Safety Coordinator and your Floor Coordinator, that the equipment is back in service.
3. Return the locks to the lockout station and complete the logbook entry.

## 2.10

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### Cords and Cables

Do not use single-to-multiple outlet converters (“cube taps”). If necessary, use power distribution strips with integral power cords and built-in overcurrent protection. These strips are available through the Argonne Materials Ordering System (AMOS).

Suspend electrical cords over the work area if possible, to avoid damaging them or creating a tripping hazard. If this is not feasible, mark the location as a work area by using appropriate signs or barricades and place “cord ducts” or other protective runways over the cords.

Properly identify electrical cables at their ends and at all spliced junctions, to facilitate eventual cable removal. Use cable tables and interwiring diagrams to document any electrical wiring that you install. Immediately remove all cables that are no longer in use and update the tables and diagrams accordingly.

Use only CAT-issued or CAT-approved extension cords. To prevent overheating or possible electrical shock, choose cords rated for current levels that exceed your needs by a safe margin.

Never run extension cords through walls, windows, or doorways or behind walls, ceilings, or floors. Never connect extension cords in series or splice them together.

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## Compressed Gases

Do not rely on color codes for identifying the gas in a cylinder.

Transport gas cylinders by securing them to four-wheeled carts. Do not attempt to roll large cylinders into place.

Secure gas cylinders across the upper half, but below the shoulder, in an upright position.

Use a pressure-relief-type regulator that is appropriate for the cylinder you are using.

Do not tamper with any safety device on a cylinder and do not lubricate, modify, or tamper with any cylinder valve.

Store gas cylinders only in the areas your CAT has designated.

If you believe that a leaking cylinder may contain a toxic, corrosive, or poisonous gas, immediately evacuate the area and dial 911.

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## Visitor Safety

Visitors who have not had the APS user orientation must be escorted whenever they are in hazardous areas, such as chemical laboratories or radiologically controlled areas. Dosimeters for visitors are available through the APS User Office (extension 2-9090).

Persons under the age of 18 are not permitted to visit any buildings in the 400 area except the offices and public areas of the CLO and LOMs and the visitors' gallery of the experiment hall.

# 3

## Safe Work Permits

Safe work permits are used to ensure that hazards remain under control while a task is performed. If you think you may need one of the following permits, discuss your plans with your CAT Safety Coordinator, who will work with your APS Floor Coordinator to obtain the permit.

### 3.1

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#### Hot Work Permit (Electrical)

This permit allows work on circuits that cannot be disconnected from an electrical energy source of 50 volts or more above ground. See Section 5.4, "Electrical Safety," for more information.

### 3.2

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#### Open-Flame and Spark-Producing Operations Permit

This permit is required when work will involve open-flame or spark-producing activities.

### 3.3

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#### Radiation Work Permit

This permit specifies the hazard controls that must be in place before you perform any radiological work that meets one or both of the following criteria:

- The task is not done frequently, or has never been done before.
- The radiological conditions are unknown and are likely to pose a significant hazard.

Chapter 5-4 of the *ANL ES&H Manual*, "Radiation Work Permits and Safety Reviews," provides more detailed information.

## Safe Use of Portable Tools

For guidance in the use of common portable tools, watch the video “Hand and Power Tool Safety,” which is available from the Office of the XFD ES&H Coordinator, or complete ANL ES&H Course #141, “Portable Hand and Power Tool Safety.”

Before using any portable power tool, check it for defects, such as the following:

- chafing, cracking, wear, or other signs of faulty cord insulation
- evidence of a faulty ground connection
- a cracked plug or receptacle housing
- bent or missing connector prongs
- a damaged switch
- a switch that has a malfunctioning trigger lock
- signs of overheating or excessive sparking
- malfunctioning guards.

If a tool is defective, immediately remove it from service.

Use appropriate personal protective equipment and footwear with soles that provide secure footing. Never wear jewelry or loose clothing that could get caught in the moving parts of a tool. Fasten long hair out of the way.

Always plug cord-connected, hand-held electric tools into GFCI-protected power sources.

Exclude all nonparticipants from the work area.

For more information, consult Chapter 7-12 of the *ANL ES&H Manual*, “Safe Use of Tools.”

# 5

## Electrical Safety

Both ANL and the APS strongly emphasize electrical safety awareness. When working at the APS, you must comply with the electrical safety practices required by ANL, which are summarized in this section. The *ANL ES&H Manual* provides more detailed information.

### 5.1

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#### General Precautions

Do not undertake any electrical work unless you have had the appropriate training and are familiar with the relevant procedures.

Always use safety glasses with plastic frames as the minimum eye protection when servicing electrical equipment.

Always remove metallic personal articles (e.g., watches, bracelets, rings, earrings, necklaces, or key chains) before working on electrical or electronic equipment.

When entering or working in any highly hazardous area (i.e., an area containing high-voltage power supplies, dischargeable capacitors, step-down transformers, complexes of electrical cabling, etc.), always have at least one person present who is trained in emergency-response procedures and who is certified to perform CPR.

Most important, if you observe a hazardous condition, immediately report it to appropriate CAT personnel and your APS Floor Coordinator.

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## Utility Distribution

The distribution of electrical power along the beamlines and in experimental stations, as well as tie-ins to utility disconnects, must be performed by ANL-supplied electricians. To obtain such services, contact your APS Floor Coordinator.

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## De-energizing Electrical Equipment

Whenever possible, de-energize electrical equipment before working on it.

### **Plug- and Cord-Connected Equipment**

First, unplug the power cord. Tag the cord and lock out the plug if the work location is far enough from the outlet to warrant these precautions. Use an appropriate test instrument (e.g., a voltmeter) to check any circuits that may contain stored electrical energy. Drain any stored energy and verify that the energy has been completely discharged. Keep the main discharge point grounded while you work on the equipment.

### **Hard-Wired Equipment**

Equipment that is hard-wired to breaker or disconnect boxes must be electrically isolated after it is de-energized, so that it cannot be inadvertently reactivated during work. Follow the ANL-required lockout/tagout procedures described in Section 2.9 of this guide.

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## Working on Electrically Energized Circuits

If you anticipate that you will need to “work hot” while at the APS, discuss your activities with your CAT Safety

Coordinator, or another individual designated by the CAT, well in advance.

For routine developmental or testing work on energized electrical circuits, follow written procedures and posted "house rules" of electrical safety.

For tasks that are not routine developmental or testing tasks and that require work on or near electrically energized components at a potential of 50 volts or greater above ground, the additional procedures outlined below must be followed.

- Obtain an approved Hot Work Permit (Electrical) for the work (see Section 3).
- Appoint a qualified person as a Safety Watch. This person will be responsible for ensuring that all appropriate protective devices and procedures are used and that all safety requirements are met. The Safety Watch must have
  - current CPR certification
  - immediate access to a telephone or radio to call 911 in case of an emergency
  - the ability to immediately cut off all sources of electrical power.
- Become thoroughly familiar with the circuitry involved.
- Locate and note all de-energizing points and energizing sources.
- Use only power sources that have adequate fault protection.
- Insulate yourself from contact with ground potential and energized parts by using such devices as insulated tools; linemen's gloves, mats, and sleeves (all inspected and tested); phenolic sheets; dry boards; rubber-soled shoes (no nails); and/or insulated mechanical barriers. Keep in mind that the insulation on energized wires may have unseen cracks or other defects.
- Avoid water and dampness.
- Ground all non-current-carrying parts that may become accidentally energized, to prevent shocks to grounded persons.
- To protect yourself against splatter caused by accidental arcing, wear plastic-framed safety glasses, a face shield, long sleeves, and a hard hat.
- Cordon off the work area to exclude all nonparticipants.

# Material Handling Guidelines

## 6.1

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### Cranes and Forklifts

Several types of hoisting and material handling/transport devices will be available to you in the experiment hall. To operate cranes and other hoisting devices, you must first receive authorization from your CAT Safety Coordinator or someone your CAT designates. If you wish to bring hoisting equipment to the APS, you must first obtain your CAT's approval.

Wear steel-toe safety shoes when performing material-handling tasks, and make use of carts, hand trucks, and pneumatic lift tables whenever possible. You may not operate a rider-type motorized forklift at the APS; your Floor Coordinator can arrange for someone to operate one on your behalf.

## 6.2

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### Obtaining Hoisting and Rigging Authorization

To obtain approval to use hoisting and rigging equipment in your sector at the APS, you must

- submit a completed Crane Operator Questionnaire (available from your CAT Safety Coordinator)
- complete any training your Safety Coordinator specifies.

# 7

## Safe Management of Hazardous Materials

### 7.1

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#### Transporting Hazardous Materials

The procedures given below apply to all materials that are considered hazardous by the U.S. Department of Transportation (DOT). Consult your CAT Safety Coordinator or the XFD ES&H Coordinator if you aren't sure whether the material in question is in this category. Shipments of small quantities of some materials may qualify for an exemption from DOT requirements. Your home institution or CAT can help you determine whether your shipment qualifies.

#### **Incoming Shipments**

When possible, obtain hazardous chemicals from the APS stockroom. If you can't get what you need from the stockroom, keep the amount being shipped to the APS as small as possible.

***Under no circumstances*** may you transport a nonexempt hazardous material to the APS in your own car or other personal vehicle.

To have a hazardous material shipped to your CAT's facilities at the APS, follow these steps:

1. Arrange to have all shipping duties handled by persons with appropriate hazardous materials training.
2. Provide the above individuals with all the information they need to prepare the shipment.
3. Inform your CAT Safety Coordinator of the planned shipment and arrange for any special handling the shipment may require upon arrival.

4. Advise the shipper to address the package to

Recipient's name

APS/ANL

Sector No. \_\_\_\_\_

Argonne National Laboratory

c/o Building 5, Hazardous Materials Receiving

9700 South Cass Avenue

Argonne, IL 60439

Also inform the shipper of any supplementary labeling information recommended by the Safety Coordinator to help ensure proper handling of the shipment upon arrival.

### **Outgoing Shipments**

To ship a hazardous material from the APS to an off-site location, follow these steps:

1. Give the following information to your CAT Safety Coordinator:
  - identity of the material
  - amount of the material
  - all associated hazards.

The Safety Coordinator will then work with ANL to prepare an ANL shipping order and obtain appropriate packaging.

2. Complete the process by working with the person designated by your CAT to be responsible for shipping arrangements.

### **Internal Shipments**

Do not use your personal vehicle to move a hazardous material from building to building within ANL. Your APS Floor Coordinator will help you arrange all on-site moves.

7.2

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## **Handling Hazardous Materials**

Provide your CAT Safety Coordinator or Chemical Safety Coordinator with timely advance notice of the chemicals you will need to use at the APS. Include appropriate hazard information when you give this notice.

Make sure that the names on container labels match the substance names on the corresponding material safety data sheets (MSDSs). If a label is missing or the MSDS is unavailable, notify your Safety Coordinator; do not use the chemical until the correct MSDS is obtained. Never remove a manufacturer-affixed label from any container.

Become familiar with the hazards associated with the chemicals you intend to use, and ensure that all required hazard controls are in place.

When transferring a hazardous chemical to a secondary container, you must

- select a container composed of a compatible material
- label the container with the chemical name that appears on the original container and the MSDS, and record any hazard warnings, including known health effects, and any special handling requirements.

Handle and store hazardous materials only in the areas designated by your CAT.

Use an appropriate fume hood or other containment device for procedures that could generate aerosols, gases, or vapors containing hazardous substances.

When working with highly toxic materials or materials of unknown toxicity, remain in visual and auditory contact with a second person who understands the work being performed and all pertinent emergency procedures.

Avoid skin contact by wearing gloves, long sleeves, and other protective apparel as appropriate. Upon leaving the work area, remove any protective apparel, place it in an appropriate labeled container, and thoroughly wash your hands, forearms, face, and neck.

Be prepared for accidents and spills. If a major spill occurs, evacuate the area and dial 911.

Keep your CAT Safety Coordinator (or designee) and your home institution informed about any actual or potential exposures to toxic materials, and satisfy all medical

monitoring requirements specified by your home institution in its chemical hygiene plan.

You can obtain information on the chemicals being used in neighboring CAT sectors through the Office of the XFD ES&H Coordinator or from an APS Floor Coordinator.

## 7.3

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### Managing Hazardous Waste

Notify your CAT of the hazardous waste likely to be generated during your stay at the APS, and consult with your Safety Coordinator about ways to minimize the amount and toxicity of the waste and provide for its safe handling, storage, and disposal.

Establish controls that will enable you to

- ensure that nonradioactive waste materials do not become activated or contaminated with radioactive materials
- certify the presence or absence of radioactive contamination in the waste you generate.

Place hazardous wastes in containers provided by your CAT and label the containers as your CAT instructs. Each time you add waste to a container, inspect the container and document the addition and your observations in the waste logbook as your CAT instructs. Add waste only to the container designated for that waste. ***If you deliberately add hazardous waste to an improper container, you could personally be subject to legal sanctions!***

When containers are filled to 75% or more of capacity, or when the waste-generating activities are completed, fill out a Chemical Waste Disposal Requisition Form (Form EWM-197), which is available from the CAT. Also, properly label each hazardous waste container with the name of the waste generator, the container's contents, and the percentages by volume of each hazardous material.

For more information, consult the *ANL Waste Handling Procedures Manual*.

# 8

## Radiation Safety

### 8.1

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#### Shielding and Personnel Safety Systems

No shielding or personnel safety system installed by the APS or included in an APS-approved configuration may be modified, removed, or disabled without a formal review by the applicable XFD safety committees and the written approval of the XFD Associate Division Director for Operations.

### 8.2

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#### Personal Dosimetry

Wear a dosimeter at all times while in the experiment hall and all other radiologically controlled facilities at the APS. Authorized analytical x-ray generator users (see Section 8.4) will also be issued ring dosimeters that must be worn on a finger when working on an x-ray instrument.

### 8.3

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#### Radioactive Materials

Use of dispersible radionuclides must be discussed in advance with your CAT and approved by the APS.

Sealed radioactive sources are managed by your CAT's Sealed Source Custodian. Contact this individual for authorization to use a sealed source.

Your Floor Coordinator can assist you in arranging for transport of radioactive materials to or from the APS.

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## Analytical X-ray Generator Operations

Only individuals who are on the list of authorized users for a specific analytical x-ray generator or associated piece of equipment may use that equipment without supervision. To become an authorized user, contact the appropriate CAT-designated Machine Custodian.

Users who are not authorized to work independently on a particular piece of equipment may work under the guidance of an authorized user of that equipment.

If an analytical x-ray generator is operated in an unsafe manner, the APS may shut down the unit or revoke the operator's authorization to use the machine.

X-ray generators may be operated in the "open-beam access mode" only when the standard access mode is impractical. During open-beam operations, a suitable barrier, guard, or interlock system must be in place to prevent any part of the operator's body from entering the primary beam path.

Immediately report malfunctions, deficiencies, unsafe conditions, and unsafe practices to the Machine Custodian.

# Directory

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	Telephone	Pager
<b>Safety Personnel</b>		
XFD ES&H Coordinator Bruce Stockmeier E-mail: bcs@aps.anl.gov	2-9394	4-9394
XFD ES&H Specialist Bill Wesolowski	2-0169	4-1826
XFD ES&H Administrative Assistant Meg Noreuil	2-2787	4-2787
XFD ES&H Secretary Clareen Krolik	2-6746	
APS Floor Coordinators (as of August 21, 1995)		
Frank Bellinger	2-0200	4-0200
Bob Ferry	2-0500	4-0500
Rod Salazar	2-0400	4-0400
Tim Smith	2-0100	4-0100
<b>Health Physics Personnel</b>		
Health Physicist V. Rao Veluri E-mail: rveluri@anl.gov	2-4252	4-1993
Chief Technician, Health Physics John Vacca	2-6180	4-1978
<b>APS User Office</b>	2-9090	

## Disclaimer

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## Important Phone Numbers

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Emergency	911
User Office	2-9090
Visitor Reception Center	2-5755

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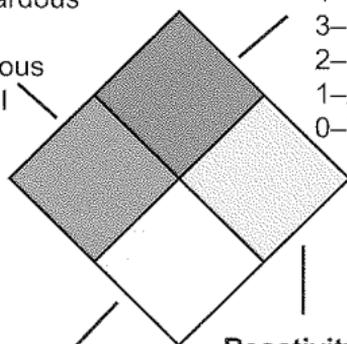
### NFPA 704 Labeling System for Chemicals

#### Health Hazard

- 4—Deadly
- 3—Extremely Hazardous
- 2—Hazardous
- 1—Slightly Hazardous
- 0—Normal Material

#### Fire Hazard

- Flash Points
- 4—Below 73°F
  - 3—Below 100°F
  - 2—Below 200°F
  - 1—Above 200°F
  - 0—Will Not Burn



#### Specific Hazard

- Oxidizer
- Acid
- Alkali
- Corrosive
- Use NO WATER
- Radiation Hazard

- OX
- ACID
- ALK
- COR
- W
- ☢

#### Reactivity

- 4—May Detonate
- 3—Shock and Heat  
May Detonate
- 2—Violent Chemical Change
- 1—Unstable If Heated
- 0—Stable



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