

XOR Sector 1 Environment, Safety and Health Plan

May 2005

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Section 1

XOR Sector 1 Safety Policies

1.0 Purpose

XOR Sector 1 is committed to ensuring that all sector activities are conducted in a safe and environmentally sound manner. This plan describes the XOR Sector 1 safety program which is implemented to fulfill this commitment.

1.1 Scope

To ensure that all sector activities are conducted in a safe and environmentally sound manner, this plan defines:

- 1) the standards to be followed by the sector, and
- 2) the responsibilities within the XOR Sector 1 organization.

1.2 References

All activities at Argonne National Laboratory - East (ANL-E) will conform to the requirements of the documents listed below, except as provided for by variances or APS procedures. All of the following are available through the XFD ES&H Coordinator:

1. ANL-E Environment, Safety and Health Manual
2. APS User Policies and Procedures relating to environment, safety and health issues
3. ANL-E Hoisting and Rigging Manual
4. ANL-E Transportation Safety Manual
5. ANL-E Waste Handling Procedures Manual

1.3 General Safety Policies

- 1) Failing to conform to this plan may result in sanctions and/or the loss of access to the APS and XOR Sector 1 facilities.
- 2) Responsibility for safety rests with line management. As such, all personnel who observe an accident are expected to ensure that line management and the XFD ES&H Coordinator are informed of the incident immediately after dialing 911 to request emergency response.
- 3) Any person has the authority to stop activities that are perceived to be unsafe or environmentally unsound.
- 4) Sector 1 will comply with the current version of the APS Configuration Control Work Policy for shielding systems. No safety system under configuration control is to be modified without beamline and APS approval in accordance with the APS Configuration Control Work Policy (Refer to the APS User Policies and

Procedures for the complete policy and procedure).

- 5) XOR Sector 1 will implement an experiment safety review program. The program will be kept current with the relevant APS policies and procedures, including those set forth in Technical Updates, User Policies and Procedures, and AOD Division Director memoranda covering the subject.
- 6) XOR Sector 1 will cooperate with the APS to facilitate the oversight responsibilities of the APS, ANL and the DOE.
- 7) Experimenters shall identify any potential hazards associated with their activities and hazardous materials to be used in experiments at the APS. No experiment shall proceed without posting of an Experiment Hazard Control Plan (EHCP) and Experiment Authorization Form (EA) generated from a properly approved APS Experiment Safety Assessment Form (ESAF).
- 8) An APS Beamline Safety Review is required for all major beamline construction projects in compliance with the APS Design Review Procedure.
- 9) All other unreviewed activities in XOR Sector 1 must be approved by the XOR Director or designees prior to the start of work. Before any change in operations that might reasonably be thought to increase the risk of significant adverse impact on the APS facilities, the environment or any person is begun, the sector will obtain the written approval of both the XOR Director and AOD Director or designees.
- 10) XOR Sector 1 will maintain a list of current safety assignments (Appendix A) and will update this plan to keep it consistent with the scope of its activities. The assignment list will be reviewed at least annually and the plan biannually with updates provided to the APS User Safety Officer.

1.4 XOR Sector 1 Specific Safety Policies

1. Experiment Safety Approval Forms (ESAF's) should be submitted to the APS Experiment Safety Review Board at least 1 week in advance of a scheduled experiment. Higher risk experiments involving radioactive material, lasers, regulated soil, etc. should be submitted at least 1 month in advance of the scheduled experiment to allow time for the proper reviews to take place. Note: A review of a biological beamline experiment that involves the ANL Biosafety Committee can take 6 – 8 weeks.
2. Chemicals brought to XOR Sector 1 should be limited to the smallest reasonable quantities necessary for the work to be performed. Whenever possible, the ANL chemical inventory database will be accessed to determine if there are any surplus chemicals already available on-site for use instead of having users purchase new chemicals or bring their own chemicals from their home institution.

Section 2–XOR Sector 1 Safety Organization & Responsibilities

The XOR Director has line responsibility for safety for all XOR Sector 1 activities at APS and for ensuring that this plan is implemented. The Director is also responsible for evaluating and responding in a graded

manner to nonconformances with this plan.

The XFD ES&H Coordinator provides safety oversight to XOR Sector 1. Specifically, he/she performs safety inspections, verifies completion of corrective actions, investigates incidents, and reviews/approves beamline experiments as a member of the APS Experiment Safety Review Board.

The XOR Sector 1 Safety Coordinator is appointed to this role by his/her Group Leader and is responsible for implementing and overseeing conformance with this Safety Plan. The XOR Sector 1 Safety Coordinator is to ensure that sector personnel have access to the ANL-E ESH Manual and the other identified standards and to assist XOR Sector 1 members and users in meeting the requirements of these standards. The XOR Sector 1 Safety Coordinator is also responsible for ensuring the correction of any safety deficiency cited by the XFD ES&H Coordinator during inspections of the XOR Sector 1 facilities.

The XOR Sector 1 Chemical Safety Coordinators is appointed to this role by his/her Group Leader and is responsible for chemical safety, including chemical waste management, and ensuring compliance with ANL and OSHA chemical safety standards in all of the sector facilities. The Chemical Safety Coordinator is also responsible for the proper use of the ANL Chemical Management System. The Chemical Safety Coordinator is to be aware of ANL ESH Manual defined chemical safety requirements.

The XOR Sector 1 Electrical Safety Coordinator is appointed to this role by his/her Group Leader and is responsible for electrical safety and ensuring compliance with ANL electrical safety standards. The Electrical Safety Coordinator is to be aware of ANL ESH Manual defined electrical safety requirements as typically attained through completing ANL electrical safety (ESH371), LOTO (ESH114), and NFPA70E (ESH375) training.

The XOR Sector 1 Shipping Coordinator is appointed to this role by his/her Group Leader and is responsible for overseeing the safe transportation of materials to and from the Sector and ensuring compliance with all ANL transportation safety standards. The shipping coordinator is to be aware of ANL transportation requirements, as well as, APS specific shipping and receiving requirements. The Shipping Coordinator will remain current in the APS transportation safety course.

The XOR Sector 1 Beamline Experiment Safety Reviewers & Approvers are appointed to this role by their Group Leader and are responsible for conducting experiment safety reviews per APS policies and procedures. They must also ensure that the beamline can adequately and safely meet the needs of a specific experiment. The Beamline Experiment Safety Reviewers & Approvers are also responsible for ensuring that all specified hazard controls are in place prior to the start of a beamline experiment.

The 431 LOM Machine Shop Coordinator is appointed by his/her Group Leader and is responsible for ensuring that the housekeeping, machine tools and associated guarding are maintained in the 431 user machine shop. The 431 LOM Machine Shop Coordinator is also responsible for maintaining an accurate list of authorized machine tool users and for performing an inspection of the area on a monthly basis. Both the authorized machine tool user and monthly inspection lists are posted at the entrance to the machine shop.

Appendix A - Safety Assignments & ESAF Approvers

Appendix A.1

XOR Sector 1 Safety Assignments

<u>Assignment</u>	<u>Person Assigned</u>
XOR Director	Gabrielle Long
XOR Sector 1 Group Leader	Dean Haeffner
XFD ES&H Coordinator	Jeff Alicz
Safety Coordinator	Ali Mashayekhi
Chemical Safety Coordinator	Ali Mashayekhi
Electrical Safety Coordinator	Ali Mashayekhi
Shipping Coordinator	Ali Mashayekhi
431 LOM Machine Shop Coordinator	Dan Legnini (XOR Sector 2) Back-up: Jack Burke (XOR Sector 3)

Appendix A.2

XOR Sector 1 Personnel with Experiment Safety Approval Authority

As Director of XOR, I authorize the following personnel to conduct hazard evaluations of experimental activities, to specify required control measures, and approve such activities where specified controls have been implemented. (Upon updating this form, the Sector will provide a copy of the revised form to the APS User Safety Officer).

Peter Lee
Dean Haeffner
Cathy Harland

Ulrich Lienert
Ali Mashayekhi

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Gabrielle Long
[Name]

XOR Director
[Title]

[Signature]

[Date]

Appendix B

APS Standard Procedures Used by XOR Sector 1

XOR Sector 1 has evaluated the hazards that will be encountered in its operations. To mitigate hazards common to APS, XOR Sector 1 will follow the APS Standard Policies and Procedures listed below without modification. (Links to these procedures can be found on the APS User Safety web page.)

1. The Management of Hazardous Waste
2. APS Technical Update 23: Transportation of Small Quantities of Hazardous Materials
3. Hand Tool and Portable Power Tool Usage
4. Guideline for Personal Protective Equipment
5. Work Area Demarcation, Warnings, and Controls
6. Electrical Safety Work Practices
7. Management of Chemicals
8. Hoisting and Rigging Operations
9. LOM Shop Usage
10. APS User Safety Guide (ANL/APS/TB-23)
11. APS Experiment Hazard Classes

In addition, XOR Sector 1 will follow the guidelines listed on the APS Safety and Training web-page http://www.aps.anl.gov/Safety_and_Training/index.html for beamline experiments involving the following:

- Use of USDA regulated soil
- Use of biological samples needing IRB review and approval by the University of Chicago
- Use of radiological samples
- Use of cryogenic liquids

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Appendix C

Sector-Specific Procedures

XOR Sector 1 will follow the procedures listed below to mitigate hazards specific to its operations.

XOR Sector 1 Guidelines for the Management of Chemicals

ROLES AND RESPONSIBILITIES

Experiment Spokespersons will:

- Provide the XOR Sector 1 Chemical Safety Coordinator with an appropriate MSDS and timely advance notice of the need to use chemicals;
- Become familiar with the hazards associated with the chemicals and ensure that the information is communicated to the persons working with the chemicals; and
- Become familiar with appropriate hazard controls and ensure that required controls are in place before workers begin using the chemicals.

Chemical Users will:

- Become familiar with the hazards associated with the chemicals before using them, and
- Become familiar with the hazard controls for the intended application of the chemicals and verify proper functioning of such controls before chemical usage begins.

Chemical Safety Coordinator will:

- Maintain an awareness of chemical-related activities conducted in the spaces under his/her control;
- Periodically verify the proper functioning of the engineered controls and the proper maintenance of storage facilities; and
- Periodically verify the proper labeling of chemicals stored in their facilities and enter any new chemical purchases in the ANL Chemical Management System.

CONTROLS ON THE INTRODUCTION AND USAGE OF CHEMICALS

Chemical Purchase

Upon acquisition of a chemical, the Chemical Safety Coordinator will add the Material Safety Data Sheet for the chemical in the respective MSDS book located outside the 431 LOM chemical lab (A030). XOR Sector 1 will also rely on information gathered from its experiment safety review process to alert it to the planned use of hazardous chemicals.

Review Criteria

XOR Sector 1 personnel reviewing the proposed new usage of a chemical will consider the following issues:

- Availability of suitable storage facilities;
- Adequacy of existing engineered controls;
- Adequacy of existing procedures and need for the chemical and relevant quantities;
- Waste handling capability and needs.

HAZARD COMMUNICATION

Material Safety Data Sheets (MSDS)

No chemical will be stored at the XOR Sector 1 facilities without a current, manufacturer-provided MSDS. All XOR Sector 1 personnel and authorized users will have access to MSDS's either through hard-copy located outside the 431 LOM chemical lab (A030) or electronically through the ANL Chemical Management System.

Container Labels

Typically, XOR Sector 1 will rely on the veracity, accuracy, and sufficiency of the manufacturer-affixed labels on the original containers. If XOR Sector 1 personnel transfer hazardous chemicals to other containers, those containers shall be labeled with an NFPA-704 conforming label with the following information:

- The name of the chemical that appears on the original container and the Material Safety Data Sheet (do not use chemical symbols and/or formulas), and
- Appropriate hazard warnings, including known health effects.

Training

XOR Sector 1 requires that all personnel using its chemical facilities successfully complete any required safety training as specified by their JHQ and/or the Experiment Safety Approval Form. The Experiment Spokesperson is responsible for providing personnel working under his/her direction with the following information:

- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area;
- The physical and health hazards of chemicals in the work area; and
- The measures that can be taken to protect oneself from these hazards, including specific procedures, the use of personal protective equipment, engineered controls and appropriate emergency procedures.

XOR Sector 1 Guidelines for the Management of Hazardous Waste

Applicability and Scope

This guideline applies to all personnel working at XOR Sector 1 facilities and to materials that are considered as hazardous waste or might reasonably be predicted to become hazardous waste. It does not address radioactive materials.

Roles and Responsibilities of Waste Generators

- Minimize the volume and toxicity of wastes through advanced planning and control of work methods;
- Communicate anticipated waste storage requirements to the Chemical Safety Coordinator;
- Manage the handling and documentation of waste.
- Establish process controls capable of ensuring that non-radioactive materials are not activated or contaminated with radioactive materials;
- Maintain pertinent information about the hazardous waste.
- Properly label hazardous waste containers, providing the name of the waste generator, the container's contents, and the percentages by volume of each hazardous waste;
- Properly package and store the container in an approved Satellite Accumulation Area (SAA);
- Inform the Chemical Safety Coordinator if the stored waste requires disposal.

Chemical Safety Coordinator

- Complete Chemical Waste Generator Training (ESH Course #574) and Chemical Waste Certification Training (ESH Course #456).
- Inform a 431 Floor Coordinator about planned activities that are expected to generate non-routine or large quantities of hazardous wastes;
- Arrange for required containers for expected hazardous wastes; and
- Maintain a supply of WMO-197 forms and SAA Inspection Checklists (These are available from the Office of the XFD ES&H Coordinator).
- Provide guidance on the use of SAAs in laboratories;
- Ensure that all hazardous wastes are properly stored and labeled;
- Arrange for disposal by ANL Waste Management Operations.

Waste Hazard Controls

Planning

XOR Sector 1 will advise all personnel working at its facilities, including all visiting users, of the importance of maintaining process knowledge so that wastes can be certified as required by the *ANL Waste Handling Procedures Manual*. The Chemical Safety Coordinator will use this information to arrange for the proper handling, storage, and disposal of the wastes. These arrangements include requesting appropriate storage containers from the ANL Waste Management Operations group.

Waste Accumulation Areas

XOR Sector 1 will establish Satellite Accumulation Areas (SAA) as needed. Each SAA will be under the control of the Chemical Safety Coordinator. A description of requirements for SAAs is available from the Office of the XFD ES&H Coordinator.

Waste Logbooks

Persons responsible for SAAs shall keep a waste logbook to document inspection data (including dates, findings, and the identity of the person performing inspections) and additions of wastes to the SAA (including dates, the identities of the materials, approximate amounts, the identities of the containers to which materials are added, and the names of persons making entries).

Waste Receptacles

Waste generators shall use the containers provided by ANL Waste Management Operations to hold wastes awaiting disposal. The waste generators shall label the containers according to instructions provided by the Chemical Safety Coordinator.

Any person who creates unforeseen hazardous waste should immediately contact the Chemical Safety Coordinator who, in turn, will arrange for a container and for the proper disposal of the waste. Under no circumstances should a person add a waste to any container other than one assigned for the disposal of that waste.

Waste Certification

XOR Sector 1 personnel will base waste certification on reliable process knowledge. When such knowledge is lacking, the Chemical Safety Coordinator will arrange for an analysis of a container's content as specified by ANL Waste Management Operations.