

**NORTHEASTERN
COLLABORATIVE ACCESS TEAM
(NE-CAT)**

Environment, Safety and Health Plan

March 2021

For any information regarding the safety plan,
Contact Narayanasami Sukumar, Safety Coordinator at 630-252-0681
(e-mail: sukumar@anl.gov)

Approved

Deputy Director: _____

Date: _____

NORTHEASTERN Collaborative Access Team Environment, Safety and Health plan

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Section 1

NE-CAT Safety Policies

1.1 Introduction

NE-CAT is committed to protecting the safety and health of its employees, its users and the environment. The experimental conditions at NE-CAT demand that each employee and user pay considerable attention to safety. All the employees of NE-CAT are expected to participate fully in required training or other safety programs relevant to the performance of their duties. To aid in maintaining a safe environment, NE-CAT has appointed a safety coordinator to address laboratory and experimental safety matters and recommend specific policies. It has formulated its safety plan in accordance with the rules and regulations of Argonne National Laboratory listed in the following documents and incorporated some of the best features of safety plans adopted by other crystallography beam lines at the APS and elsewhere. This safety plan cover all activities conducted at Sector 24.

1. Argonne Laboratory Management System PROCs
2. APS User Policies and Procedures
3. ANL Hoisting and Rigging Manual
4. ANL Transportation Safety Manual
5. ANL Waste Handling Procedures Manual
6. APS Technical Updates

1.2 General Safety Policies

1. Failing to conform to this plan may result in sanctions and/or the loss of access to the APS and CAT facilities.
2. Any person has the authority to stop activities that are unsafe or environmentally unsound. In addition, the CAT acknowledges that the APS has the authority to order a halt to CAT activities that the APS, or other entities with oversight responsibilities, deem unsafe or not in compliance with requirements.
3. The CAT will comply with the APS policy and procedure for configuration control of shielding systems. No safety system under configuration control is to be modified without CAT and APS approval. (Refer to the APS User Policies and Procedures for the complete policy and procedure and Appendix 4).

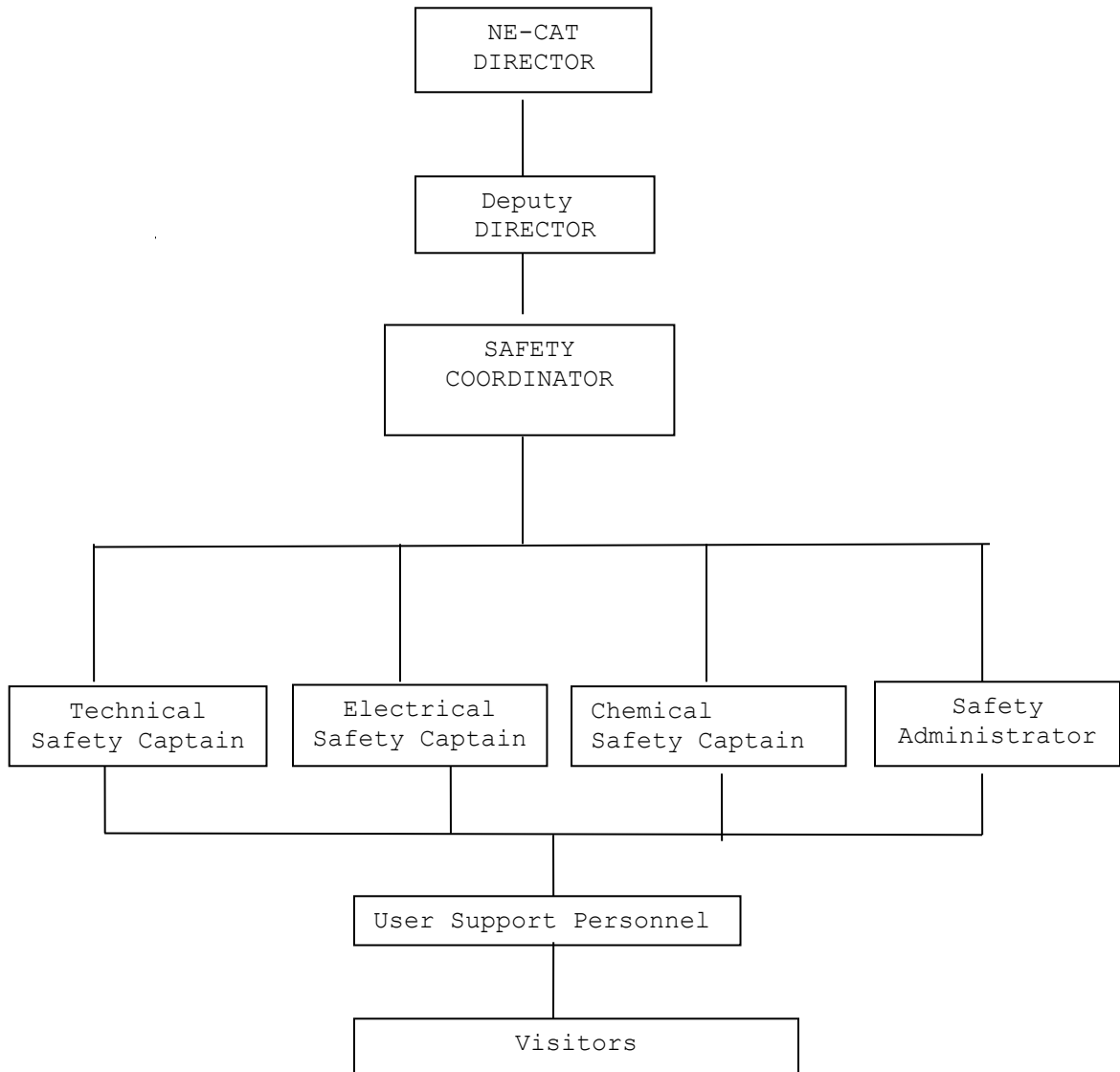
4. The CAT will cooperate with the APS to facilitate the oversight responsibilities of the APS, ANL and the DOE.
5. The NE-CAT will implement an experiment safety review program. The program will be kept current with the relevant APS policies and procedures, including those set forth in Technical Updates, User Policies and Procedures, and AES Division Director memoranda covering the subject.
6. Experimenters shall identify to the CAT the potential hazards associated with their activities and hazardous materials to be used in experiments at the APS (via the APS Experiment Safety Assessment Form (ESAF), and no experiment shall proceed without a CAT and APS approved ESAF and posted APS Experiment Authorization Form (ESA) and Experiment Hazard Control Plan (EHCP).
7. The CAT will fully comply with the “Work Alone” policy of ANL-E and NE-CAT’s specific policy (Refer Appendix 5).
8. New or modified equipment and un-reviewed activities must be approved by the CAT Deputy Director or Technical Safety Captain with the knowledge of the Safety Coordinator, prior to energizing the equipment or the start of work. Before any change is made in the CAT’s operations that might reasonably be thought to increase the risk of significant adverse impact on the APS facilities, the environment or any person, the CAT will obtain the written approval of the APS Engineering Support Director, or designee.
9. The CAT will maintain a list of current safety positions (Section 2.3) and will update this plan to keep it consistent with the scope of CAT activities. The safety position list and the safety plan will be reviewed triennially with updates provided to the APS User ESH Support office.

1.3 CAT Specific Safety Policies

1. Samples and reagents brought to the NE-CAT APS facility by NE-CAT members and general users must require no greater than the classification of Biosafety Level 1 (BSL1) as defined by the American Biological Safety Association in most recent edition of “Biosafety in Microbiological and Biomedical Laboratories (BMBL)”. Any BSL2 or BSL3 activity at ANL and APS requires the approval of the ANL Institutional Biosafety Committee. Those reviews will be arranged through the APS User ESH Support Group.
2. All work performed at the NE-CAT facility that is governed by this safety document will be classified to be contained within the APS Experimental Safety Envelopes 1 (APS Base) and 2 (Cryogenics). Any deviation from these policies will require a specific operating procedure to be developed by the NE-CAT safety coordinator in consultation with the appropriate ANL/APS safety personnel.
3. The confidentiality of the research conducted by NE-CAT members and general users

will be maintained if requested by marking appropriate column while submitting the APS ESAF form. The users with proprietary samples would hand over the details of the samples in a sealed envelope to Safety Coordinator before starting their experiments and would be returned back to them when their experiments are completed. The sample information will be made available to the ANL/APS safety personnel upon request to the Safety Coordinator during the performance of experiments at the beamlines.

Section 2 NE-CAT Safety Organization and Responsibilities



2.1 NE-CAT Safety Organization

NE-CAT safety organization chart shows the line of responsibility flows from the Director, through the Deputy Director, to the Safety Coordinator down to the visitor.

2.2 Responsibilities

2.2.1 DIRECTOR

The **NE-CAT Director** has overall responsibility for safety of all CAT activities at ANL and for ensuring that this plan is implemented. The Director is also responsible for evaluating and responding in a graded manner to non-conformances with this plan. The Director, or his designee, is responsible for making all appointments. The CAT Director names as his designee for on-site management of all operational and technical activities, the NE-CAT Deputy Director.

2.2.2 DEPUTY DIRECTOR

The **NE-CAT Deputy Director**, reporting to the NE-CAT Director, will assume the duties for overall day-to-day responsibility for the safety of the beamline construction, operations, and technical equipment upgrade and user programs. This responsibility includes ensuring that the work performed by NE-CAT staff and visitors is in accordance with the provisions of this Safety Plan. The Deputy Director works closely with the NE-CAT Safety Coordinator in identifying and resolving operational safety and environmental issues involving NE-CAT personnel and visitors. The Deputy Director has the authority to stop any NE-CAT activity judged to be unsafe or environmentally unsound. The Deputy Director along with the Safety Coordinator is responsible for the adequacy of construction, installations, beam line equipment and operational related accident and incident investigations.

2.2.3 SAFETY COORDINATOR

The **NE-CAT Safety Coordinator** advises the NE-CAT director and his deputy on safety-related matters to ensure that day-to-day operations are carried out in accordance with the practices and policies covered by this plan. The Safety Coordinator is on-site full-time, and as such will be responsible for the *day-to-day* maintenance of safe conditions in all NE-CAT's facilities. The Safety Coordinator will ensure that NE-CAT personnel properly execute the safety-related responsibilities assigned to them. The Safety Coordinator is NE-CAT's primary contact with the APS on environmental, safety, and health issues. The Safety Coordinator has the authority to stop any NE-CAT activity judged to be unsafe or environmentally unsound. The CAT Safety Coordinator is to ensure that all the safety captains maintain all the relevant ANL LMS system manuals and documents. He/She will work closely with the Deputy Director during accident or incident investigation.

2.2.4 ELECTRICAL SAFETY CAPTAIN

The **NE-CAT Electrical Safety Captain** is to be knowledgeable of ANL LMS defined electrical safety requirements as typically attained through completing ANL electrical safety

and LOTO training. He/She is to ensure that the CAT has access to the ANL LMS system concerning electrical safety requirements and the other identified standards and to assist CAT members and visitors in meeting these requirements. He/She will report to the Safety Coordinator. The duties of the Electrical Safety Captain include the following:

- Reviews proposed experiments to verify that adequate safeguards will be in place to control electrical hazards;
- Inspects electrical equipment to be used during experiments and temporary electrical installations to verify adherence to electrical safety design criteria; if need arise, request a DEEI inspection.
- Verifies compliance with ANL lockout and tag out procedures when these are required to control hazardous electrical energy;
- Reviews and approves the procedures for NE-CAT personnel and users to follow when working hot (electrically), i.e., working on or near electrically energized components that have a potential of 50 volts or greater to ground and
- Maintains clear and comprehensive records regarding electrical utilities, grounding diagrams, signal cables, etc., for all of NE-CAT's facilities at the ANL.

2.2.5 TECHNICAL SAFETY CAPTAIN

The **NE-CAT Technical Safety Captain** is responsible for all the mechanical related safety and ensuring compliance with ANL mechanical safety requirements in all of the CAT's facilities. The Technical Safety Captain is to be knowledgeable of ANL LMS system defined mechanical safety requirements as typically attained through completing ANL mechanical safety and LOTO training. He/She is to ensure that the CAT has access to the ANL LMS system concerning mechanical safety requirements and the other identified standards and to assist CAT members and visitors in meeting these requirements. The NE-CAT guideline for the Management of Hoisting and Rigging Operation is defined in Section 3.3. He /She will report to the Safety Coordinator. The duties of Technical Safety Coordinator include the following:

- Inspects mechanical equipment to be used during experiments and temporary mechanical installations to verify adherence to mechanical safety design criteria;
- Reviews and approves the procedures for NE-CAT personnel and visitors to follow when working with any mechanical equipment;
- Maintains clear and comprehensive records of all mechanical equipment at the NE-CAT's facilities at the ANL.
- Responsible for all hoisting and rigging activities at NE-CAT facilities.

2.2.6 CHEMICAL SAFETY CAPTAIN

The **NE-CAT Chemical Safety Captain** is responsible for chemical safety, including chemical waste management, and ensuring compliance with ANL and OSHA chemical safety standards in all of the CAT's facilities. The Chemical Safety Captain is also responsible for the CAT's proper use of the ANL Chemical Management System. The Chemical Safety Captain is to be knowledgeable of ANL LMS system defined chemical safety requirements. A hazardous waste accumulation site will be maintained by the NE-CAT Chemical Safety Captain in accordance

with the appropriate ANL/APS guidelines. The NE-CAT guidelines for the Management of Chemical and Hazardous Waste are defined in Section 3.1 and 3.2. He/She will report to the Safety Coordinator. The duties of the Chemical Safety Captain include the following:

- To ensure that all chemical wastes, particularly hazardous wastes, are disposed of in accordance with APS requirements.
- Reviews and approves the proposals from the user to use wet laboratory facility of NE-CAT;
- Advise and oversee the samples and crystals stored in liquid nitrogen storage tanks by NE-CAT members and users.
- Maintains essential safety equipments like gloves, goggles, face shields etc.

2.2.7 SAFETY ADMINISTRATOR

The **NE-CAT Safety Administrator** is responsible for maintaining MSDS records of all the chemicals purchased and/or stored at NE-CAT's laboratory. Also, he/she maintains all the safety documents provided by Safety Coordinator/Safety Captains. The safety administrator will ensure that NE-CAT personnel complete the required training and will keep the records on their training. He/She will report to the Safety Coordinator.

2.2.8 USER SUPPORT PERSONNEL

The **NE-CAT User Support Personnel** are responsible for the training of users and safe operations of the CAT's beam lines by the CAT members and general users. The User Support Personnel are responsible for overseeing and conducting the facility specific sector orientation, safe transportation of materials to and from the CAT and ensuring compliance with ANL transportation safety requirements. All User Support Personnel will be knowledgeable of ANL transportation requirements as well as APS specific shipping and receiving requirements. All the User Support Personnel will get advice from the Safety Coordinator/Safety Captains regarding all the safety related issues.

2.2.9 VISITORS

The **NE-CAT Visitors** include scientists, technicians, beam line users, engineers, vendors, students, etc., who have been approved by NE-CAT personnel to spend time at NE-CAT facilities. All visitors who will spend more than five (5) working days at the APS during a calendar year or who will do hands-on work during a shorter visit and possibly become exposed to work-related hazards should consult with the NE-CAT Safety Coordinator or concerned Safety Captains to determine whether they need safety training beyond the standard APS User Orientation, Cyber security, GERT and Sector specific training.

2.3 NE-CAT Safety Positions[#]

Positions	Name
Director	Steven E. Ealick
Deputy Director	Malcolm Capel
Safety Coordinator	Narayanasami Sukumar
Electrical Safety Captain	Jim Withrow (Ed Lynch)*
Technical Safety Captain	Ed Lynch (Jim Withrow)*
Chemical Safety Captain	Narayanasami Sukumar (Igor Kourinov)*
User support personnel	Banerjee,Kaya,Kourinov,Murphy,Neau, Perry,Schuermann, Sukumar
Safety Administrator	Cyndi Salbego

* Names in parentheses are the substitute during the absence of respective Safety Captains.

[#] During the absence of the Safety Coordinator, the Chemical, Electrical and Technical Safety captains will report to the Deputy Director.

2.4 NE-CAT Personnel with Experiment Safety Approval Authority*

As Deputy Director of NE-CAT, 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 CAT will provide a copy of the revised form to the APS User ESH Support office).

1. Malcolm Capel (Technical & Electrical related issues, ESAF in emergency)
2. Narayanasami Sukumar (Chemical related issues, ESAF)
3. Kourinov (Chemical related issues in emergency)
4. David Neau (ESAF in emergency)
5. Ed Lynch (Technical related issues and Electrical related issues in emergency)
6. Jim Withrow (Electrical related issues and Technical related issues in emergency)

*“In emergency” personnel will handle the cases only if the primary designated persons are not available on-site and are not accessible for NE-CAT personnel.

2.5 Standard Procedures used by NE-CAT

NE-CAT has evaluated the hazards that will be encountered in its operations, and to mitigate these hazards, the CAT will follow the unmodified APS Standard Procedures listed below. (Links to these procedures can be found on the APS User Safety web page.)

1. The Management of Hazardous Waste
2. APS User Policy and Procedure for Hazardous Materials Transportation (APS_1410268)
3. APS Guideline for Hand Tool and Portable Power Tool Usage
4. APS Guideline for Personal Protective Equipment
5. APS Guideline for Work Area Demarcation, Warnings, and Controls
6. APS Policy and Procedure for the Management of Chemicals
7. Hoisting and Rigging Operations
8. LOM Shop Usage
9. APS Standard Experiment Hazard Classes for Experiment Activities at the Advanced Photon Source

Section 3

NE-CAT Specific Procedures

NE-CAT has evaluated the hazards that will be encountered in its operations, and, to mitigate these hazards, the CAT has developed and will follow the procedures listed below. Examples of the forms and details are listed in Appendices 1-5.

3.1 NE-CAT Guideline for Management of Chemicals

3.1.1 INTRODUCTION

This guideline describes the policies and practices that NE-CAT will follow to reduce accidents and control adverse effects that may result from the use of hazardous substances in NE-CAT's facilities at the APS. This guideline applies to all chemicals used for NE-CAT's installation and maintenance activities and to all chemical reagents used for laboratory purposes. Experimental samples are included only to the extent specified below.

While this guideline does provide policies and general guidance, it may not include all precautions that are needed for the safe conduct of certain operations. NE-CAT has developed other guidelines that define how hazard controls for individual operations will be determined and implemented. In the case of users, the **spokesperson of user's group** is responsible for obtaining the information and implementing the controls necessary for workers to perform work without endangering themselves, others, or the environment. NE-CAT welcomes suggestions for alternatives to the proposed controls.

3.1.2 ROLES AND RESPONSIBILITIES

3.1.2.1 Users of Chemicals 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 the proper functioning of such controls before chemical usage begins.

3.1.2.2 Spokesperson of user's group will:

- Provide the NE-CAT Safety Coordinator or Chemical Safety Captain with timely advanced notice of the need to use chemicals;
- Give the NE-CAT Safety Coordinator appropriate safety information for each chemical;
- 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.

3.1.2.3 Chemical Safety Captain 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.

3.1.3 CONTROLS ON THE INTRODUCTION AND USAGE OF CHEMICALS

3.1.3.1 Pre-Purchase

NE-CAT Safety Administrator will add the Material Safety Data Sheets for the chemicals in the file, once they have been ordered by any NE-CAT personnel or brought in by the users. NE-CAT will also rely on information gleaned from its Experiment Safety Review procedure to alert it to the planned use of hazardous chemicals.

3.1.3.2 Review Criteria

NE-CAT personnel reviewing the proposed new usage of a chemical in the NE-CAT facilities will consider the following issues:

- Availability of suitable storage facilities;
- Adequacy of existing engineered controls;
- Adequacy of existing procedures;
- Waste handling capability and needs;

3.1.4 HAZARD COMMUNICATION

3.1.4.1 Material Safety Data Sheets (MSDS)

No chemical will be stored at the NE-CAT facilities without a current, manufacturer-provided MSDS. The NE-CAT safety administrator will maintain the file on MSDS list of chemicals and verify that the chemical appears on the List of Hazardous Chemicals. All NE-CAT personnel and authorized users will have access to MSDS (located at room E030 (wet lab) and at web <https://webapps.inside.anl.gov/coral>).

3.1.4.2 Container Labels

All containers holding hazardous chemicals in NE-CAT's facilities at the APS will be labeled in accordance with OSHA requirements (see Reference). NE-CAT will rely on the veracity, accuracy, and sufficiency of the manufacturer-affixed labels on the original containers. NE-CAT

personnel shall not remove manufacturer-affixed labels. If NE-CAT personnel transfer hazardous chemicals to other containers, those containers shall be labeled, at a minimum, with:

- The name of the chemical that appears on the original container and the Safety Data Sheet;
- Appropriate hazard warnings, including known health effects.

NE-CAT permits the use of NFPA 704 labels providing they contain additional text describing health effects and other specific hazard warnings.

3.1.4.3 Training

NE-CAT requires all personnel using its facilities should follow the advice of the Chemical Safety Captain. The Spokesperson of the user's group is responsible for providing personnel working under his/her direction with this information, which includes the following:

- 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 required by NE-CAT, the use of personal protective equipment and engineered controls specified by NE-CAT, and appropriate emergency procedures.

NE-CAT and its personnel may, as is appropriate on a case-by-case basis, use the training capabilities of Argonne National Laboratory and the APS to satisfy chemical-specific training requirements.

3.1.5 REFERENCE

For more information on the management of hazardous chemicals, see the OSHA Hazard Communication Standard, Title 29 CFR 1910.1200, or ESH4.3 of the *ANL LMS*.

3.2 NE-CAT Guideline for Management of Hazardous Waste

3.2.1 Introduction

The procedures described in this guideline are intended to keep the NE-CAT's APS operations in compliance with Resource Conservation and Recovery Act (RCRA) requirements and Argonne National Laboratory policies, and minimize the environmental impact caused by use of the NE-CAT facilities at the APS.

3.2.2 Definitions

- Hazardous waste: any unwanted, non-recyclable, unsalvageable solid, liquid, or gaseous material that is considered hazardous if released without treatment or control into the environment. A listing of detailed criteria for characterizing materials as hazardous waste is available from the Office of the AES ES&H Coordinator.
- Waste generator: the person whose work generates a (hazardous) waste.
- Process knowledge: the waste generator's knowledge of the source, use, handling, and storage of a material, particularly about the potential for radioactive contamination by activation or cross contamination.
- Satellite Accumulation Area: a demarcated area set aside for the temporary storage of hazardous waste at or near the point of generation. Wastes in a Satellite Accumulation Area (SAA) are under the control of the waste generator.

3.2.3 Applicability and Scope

This guideline applies to all personnel working at the NE-CAT's APS facilities and to materials that are hazardous waste or might reasonably be predicted to become hazardous waste. It does not address radioactive materials.

3.2.4 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 Captain;
- Manage the handling and documentation of waste so that it can be disposed of by Argonne National Laboratory legally, efficiently, and cost-effectively;
- 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;
- Inform the Chemical Safety Captain if the stored waste requires disposal; and
- Complete form WMO-197, the Chemical Waste Disposal Requisition and Certification Form for Chemical Waste. The Chemical Safety Captain will provide assistance.

3.2.5 Chemical Safety Captain

- Complete Chemical Waste Generator Training (ESH Course #574), and Waste Certification Training (ESH Course #456);
- Inform the Sector's APS 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 AES 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 EMO – Waste Management Operations

3.2.6 Waste Hazard Controls

3.2.6.1 Planning

NE-CAT will advise all personnel working at its APS 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*. If any user wants to dispose the waste, he/she needs to consult Chemical Safety Captain regarding any waste likely to be generated during their stay at the APS. The NE-CAT Safety Coordinator or Chemical Safety Captain 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 EMO-Waste Management Operations group.

NE-CAT staff based at the APS who expect to generate hazardous waste will follow the advice of Chemical Safety Captain/Safety Coordinator.

3.2.6.2 Waste Accumulation Areas

NE-CAT will establish Satellite Accumulation Areas (SAA) as needed. Each SAA will be under the control of the waste generator. A description of requirements for SAAs is available from the Office of the AES ES&H Coordinator.

3.2.6.3 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).

3.2.6.4 Waste Receptacles

Waste generators shall use the containers provided by EMO to hold wastes awaiting disposal. The waste generators shall label the containers according to instructions provided by the Chemical Safety Captain.

Waste receptacles will be kept out of radiological controlled areas whenever possible. If a container must be placed in a controlled area, the waste generator shall take all steps necessary to prevent radioactive contamination of the waste.

Any person who creates unforeseen hazardous waste should immediately contact the Chemical Safety Captain who in turn, will arrange for a container and for the 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. Persons who improperly add hazardous waste to any other container are subject, as individuals, not only to NE-CAT-imposed sanctions, but possible federal enforcement action and penalties.

3.2.6.5 Waste Certification

NE-CAT personnel will base waste certification on reliable process knowledge. When such knowledge is lacking, the Chemical Safety Captain will arrange for analysis of a container's radiological content as specified by ANL EMO, at the waste generator's expense.

In those instances where Chemical Waste Disposal Requisitions have been completed by waste generators who have not completed ANL Chemical Waste Generator Training and Waste Certification Training, the Chemical Safety Captain, if available, or Safety Coordinator will countersign the form as an indication that he or she believes that the information is accurate.

3.2.6.6 Steps to Follow When Disposing Hazardous Waste

1. Before producing a hazardous waste, the generator should consult and follow the advice of Chemical Safety Captain. The consultation should start before the arrival at the APS. Pertinent information should always be included in the experiment safety review submissions.
2. Waste generators shall place hazardous wastes in receptacles provided by the Chemical Safety Captain (who will obtain them through ANL EMO-Waste Management Operations). Prior to the first addition of waste to a container, the generator will label the receptacle as instructed by the Chemical Safety Captain. At the time of each addition, the waste generator will document the addition of waste in the Waste Logbook for the SAA.
3. When containers are filled to 75% or more of capacity or upon completion of the activities that generated these wastes, generators will complete Chemical Waste Disposal Requisitions (Form WMO-197), available through the Chemical Safety Captain.
4. Waste generators or, in the case of visiting researchers, the Chemical Safety Captain will contact the APS Floor Coordinator to arrange for required surveys and pick-up by ANL Waste Management Operations.

3.2.7 Reference

- *Waste Handling Procedures Manual*, Argonne National Laboratory.

3.3 NE-CAT Guideline for Hoisting and Rigging Operations

3.3.1 Introduction

This document provides basic guidelines for hoisting and rigging activities conducted by NE-CAT personnel working at the APS. These guidelines are designed to reduce the risks associated with these operations and ensure compliance with all applicable standards and laboratory requirements. The training and user approval requirements defined below apply to all NE-CAT personnel working with hoists and cranes at the APS. The equipment acceptance protocol applies to all hoists, cranes, slings, chain, etc., brought to the APS by NE-CAT. All users of the chain-fall hoists must be trained to use them.

3.3.2 NE-CAT Hoisting and Rigging Experts

The NE-CAT Technical Safety Captain will satisfy the training and qualification requirements specified by ANL for incidental crane operators. Only the NE-CAT Deputy Director/Technical Safety Captain with the knowledge of the Safety Coordinator are authorized to approve operators and make determinations about the suitability and operating condition of hoisting and rigging equipment and perform the other training, evaluation, and oversight functions described below.

3.3.3 Hoisting and Rigging Equipment

NE-CAT personnel who wish to bring hoisting and rigging equipment to the NE-CAT sector at the APS shall follow the following procedure before the equipment is put into service. Any equipment procurement must be in full compliance with the ANL-E Hoisting and Rigging Manual.

3.3.3.1 User will

- ensure that equipment to be brought to the APS has, as appropriate, manufacturer-affixed load ratings, etc.
- inform the NE-CAT Technical Safety Captain with a description of the equipment and its intended use; and
- provide the NE-CAT Technical Safety Captain with a copy of any certification or manufacturer-conducted testing documentation associated with the equipment. If the equipment has not been certified or tested by the manufacturer, the user has it tested or inspected by a recognized crane-testing organization that is approved by the NE-CAT Technical Safety Captain, and gives the Technical Safety Captain a copy of the resulting documentation. (The original documentation shall be filed in the NE-CAT office at the APS when the equipment is moved to the site).

3.3.3.2 Technical Safety Captain will

- determine if the equipment is suitable for the intended use;

- inspect the equipment and documents (inspection checklists are available from the Office of the AES ES&H Coordinator) and also files the acceptance document with the certification and testing or inspection reports for the equipment; and
- notify the appropriate APS Floor Coordinator about the arrival of the equipment, its intended use, and its location by providing the Floor Coordinator with a copy of the Hoisting Equipment Data Sheet shown in form I of Appendix 3.
- aid the APS to perform a cursory inspection of the equipment. Note: Passing this inspection does NOT constitute an approval or certification of the equipment by ANL.
- tag the equipment with the information shown in form II of Appendix 3.

3.3.3.3 Other Requirements

- The NE-CAT Technical Safety Captain will perform or arrange for the inspections of the equipment as required by the ANL-E Hoisting and Rigging Manual and will document the inspections (inspection checklists are available from the Office of the AES ES&H Coordinator). Records shall be filed in the NE-CAT office and will be made available for inspection by the CAT Safety Coordinator and APS ES&H personnel.
- The NE-CAT Safety Coordinator shall periodically check logs to insure that the inspections have been performed as required by the ANL-E Hoisting and Rigging Manual.
- *Operator Authorization to Perform Hoisting & Rigging* : If the possibility exists that a proposed lifting operation could affect the APS storage ring or another CAT's sector, the NE-CAT Safety Coordinator will discuss the planned operation with the APS Floor Coordinator or the AES ES&H Coordinator. If that person agrees that this possibility exists, the APS will arrange for the operation to be done by ANL Plant Facilities and Services personnel. If hoisting and rigging equipment is to be operated by an ANL employee, the operator training and certification must be in full compliance with the ANL-E Hoisting and Rigging Manual. In all other cases, the following process is used to authorize individuals to use hoisting equipment in the NE-CAT sector:
 - (a) The prospective operator submits a completed Crane Operator Questionnaire (see form III of Appendix 3) to the NE-CAT Technical Safety Captain.
 - (b) The NE-CAT Technical Safety Captain determines whether the user's training and experience is suitable for the equipment to be used.
 - (c) The NE-CAT Technical Safety Captain informs the user of the additional training, if any, needed to use the equipment. As appropriate, the NE-CAT Technical Safety Captain may arrange for training through the AES Training Management System Representative.

(d) The NE-CAT Technical Safety Captain provides qualified candidates with an orientation to the hoisting and rigging equipment they need to use and describes the applicable requirements and limitations.

(e) The NE-CAT Technical Safety Captain logs the name of each qualified candidate and sends a copy of the log to the appropriate APS Floor Coordinator.

3.3.4 References

This guidance document is based on the following sources:

- (a) The American Society of Mechanical Engineers B30 Series standards;
- (b) The U. S. Department of Energy Hoisting and Rigging Manual;
- (c) The ANL [LMS](#); and
- (d) The Argonne National Laboratory-East Hoisting and Rigging Manual.

Appendix 1

NE-CAT Sector Orientation Training

NE-CAT regards the safety of the experimenters and others at the APS to be of principal importance. No experiment or operation will be permitted on the experimental floor if it poses a significant safety risk.

Safety Politics and Resources

- Orientation to the NE-CAT’s Environmental, Safety, & Health plan
- Introduction of the NE-CAT’s Safety Coordinator, Safety Captains
- Explanation of NE-CAT’s policies pertaining to management of chemical and control of hazards
- Explanation of the ANL “Stop Work” and “Work Alone” policies

General Safety Information

- Location of safety equipment (fire extinguisher, shower, eyewash station, etc.)
- Location of safety documentation (including MSDSs and relevant procedures)
- Location of nearest emergency exits, telephones
- Learn emergency medical and security phone number 911
- Learn how to contact floor coordinator
- Learn how to respond to alarms and other warnings
- PPE to wear during loading of samples/handling liquid nitrogen
- Procedure for using liquid nitrogen and storing samples at site
- Disposal of wastes, including hazardous waste
- Electrical safety
- Complete the NE-CAT facilities tour
- Complete, receive approval, and post- APS Experimental Safety Approval Form
- Complete Personnel Safety System (PSS), End Station, Wet Laboratory trainings
- User Restricted Activities
- Read and will abide by NE-CAT user operation policy

Conducted by: _____
Name Date

I have completed and understand the safety and operational procedures outlined above and agree to conduct my experiments in a safe manner, in accord with the safety policies and procedures of Argonne National Laboratory, the Advanced Photon Source, and NE-CAT.

Name Signature Badge Number Date

Appendix 2

NE-CAT User's Experiments/Samples Information

All the users should obtain site access from APS (even for remote data collection) to perform experiments at NECAT beamlines. All the remote and onsite users should complete their required training to do experiments at NECAT beamlines. All remote users should complete the only required safety training ESH223 before submitting their ESAF. All the users who have been approved to do experiments at NE-CAT's facilities should provide all the information pertaining to their experiments at the APS Experiment Safety Review System by submitting Experiment Safety Approval Form (ESAF) at least a week before the starting date of the experiments. The submitted ESAF has to be approved by management of APS as well as the Safety Coordinator of NE-CAT before the users can start to do their experiments. The NE-CAT members and general users can protect the confidentiality of their research by clicking the appropriate box while submitting ESAF. The users with proprietary samples should handover the details of the samples in a sealed envelope to the Safety Coordinator before starting their experiments and the envelope would be returned back to them when their experiments are completed. The sample information will be made available to the ANL/APS safety personnel upon request to the Safety Coordinator during the performance of experiments at the beamlines. Additional information is required for users whose samples are virus, toxic, agricultural hazard, heavy atom derivatives, radioactive, regulated soil samples, derived from human tissue/blood or cell. Detailed instructions are given at the Experiment Safety Review System. Also, users can obtain details by contacting the NE-CAT's safety coordinator.

Appendix 3

Hoisting and Rigging Operation Approval Forms

Form I: HOISTING EQUIPMENT DATA SHEET

EQUIPMENT TYPE: _____
MANUFACTURER: _____
MODEL# _____ SERIAL# _____
LOAD RATING: _____
EQUIPMENT I.D.: _____
INTENDED USE: _____
LOCATION OF EQUIPMENT CERTIFICATION/TESTING DATA: _____

Form II: HOISTING EQUIPMENT IDENTIFICATION TAG

TYPE: _____
I.D. # _____
DATE OF ARRIVAL AT THE APS: _____
TECHNICAL SAFETY CAPTAIN: (SIGNATURE AND DATE)

APS FLOOR COORDINATOR: (SIGNATURE AND DATE)

DATE IN SERVICE: _____
NEXT INSPECTION DATE: _____

Form III: CRANE OPERATOR QUESTIONNAIRE

Date _____ Operator _____

CAT _____ Telephone _____

Supervisor _____

Briefly describe the type/s of lifting device/s to be used and the expected weight loads.

Lifting Device Weight Load

Operator training/experience operating a crane or other lifting device:

Date/Description of Training:

I certify that, to the best of my knowledge, I have normal depth perception, field of vision, reaction time, manual dexterity, and coordination, and do not have a detectable or known disease or physical malfunction that would render me incapable of safe operation or rigging duties.

Candidate's signature

Appendix 4

NE-CAT Policy on Configuration Control

NE-CAT is fully committed to comply with the “Configuration Control Work Permit Policy and Procedure (May 28, 2003)” of the Advanced Photon Source (APS) of Argonne National Laboratory, which states that “It is the responsibility of the APS users, as well as the APS personnel, to ensure that the beamline protection systems are not compromised”.

No NE-CAT member shall make changes to beamline components that are designated and tagged as “APS Configuration Control”. If changes are to be made to these components, the requests shall be made directly to Malcolm Capel, Deputy Director of NE-CAT, who is responsible for all work relating to the optical and safety components of all NE-CAT beamlines. If Malcolm Capel decides that changes must be made, he shall complete and submit a “Configuration Control Work Permit (Form UO-29)” to the Floor Coordinator for action as per APS policy.

In the event of a failure of a beamline component tagged as “APS Configuration Control”, the User Enable Key(s) of the affected enclosures shall be immediately removed and given to the Floor Coordinator with a description of the malfunction. Malcolm Capel must then be notified immediately or in his absence Ed Lynch, Technical Safety Captain shall be notified.

In the event of a need for immediate response due to a component failure when Malcolm Capel is unavailable, Ed Lynch or in his absence Jim Withrow have the authorization to file the Configuration Control Work Permit (Form UO-29)

Ed Lynch shall maintain a current listing of all NE-CAT components identified by the APS as under “APS Configuration Control” and keep a current listing posted on the safety boards of each beamline. He shall maintain the operation logs on any work done on components under “APS Configuration Control”.

Appendix 5

NE-CAT User Work Alone Policy

NE-CAT is fully committed to comply with the “Work Alone” policy of Argonne National Laboratory (ANL). Laboratory policy allows individuals to work alone as long as they “... will not be subject to increased risk as a consequence.” The NE-CAT Sector 24 facility consists of “routine laboratory hazards” as defined by the Laboratory and, therefore, represents low risks to users. To meet Laboratory requirements, before work alone is permitted, an assessment must be made as to the need that the user must work alone, is the individual capable of working alone, will the user have ready access to communication systems to contact the appropriate personnel in the event of an emergency, and is the user knowledgeable of emergency procedures.

NE-CAT recommends that users visit the facility in groups, at least a minimum of two persons. However, if a researcher must work alone, the following procedures shall be followed:

1. The user shall notify the NE-CAT support staff assigned responsibility for that user that he/she intends to work alone and must receive prior approval to do so.
2. The NE-CAT support staff member may grant permission to the user to work alone by considering that the following factors (but not limited to) such as user competency, experience, language fluency and physical abilities do not contribute to increased risk when working alone.
3. If approval is granted, the NE-CAT support staff shall insure that the user is trained on the proper procedures to be followed in the event of an emergency. The user must also be instructed as to where the emergency procedures and the NE-CAT call list are posted.
4. During normal business hours, the NE-CAT support staff shall check on the status of the user periodically.

NE-CAT LN₂ FILL STATION

User guide



NECAT LN₂ filling station

Verify all parts of the fill station are connected as shown in the picture. If not, contact your NECAT host.



2. Wear the **PERSONAL PROTECTIVE EQUIPMENT (PPE)**. PPE (safety glass, face shield, shoe covers, cryogenic gloves and apron) must be worn while operating LN2 filling station.



PURGE

FILL

STOP

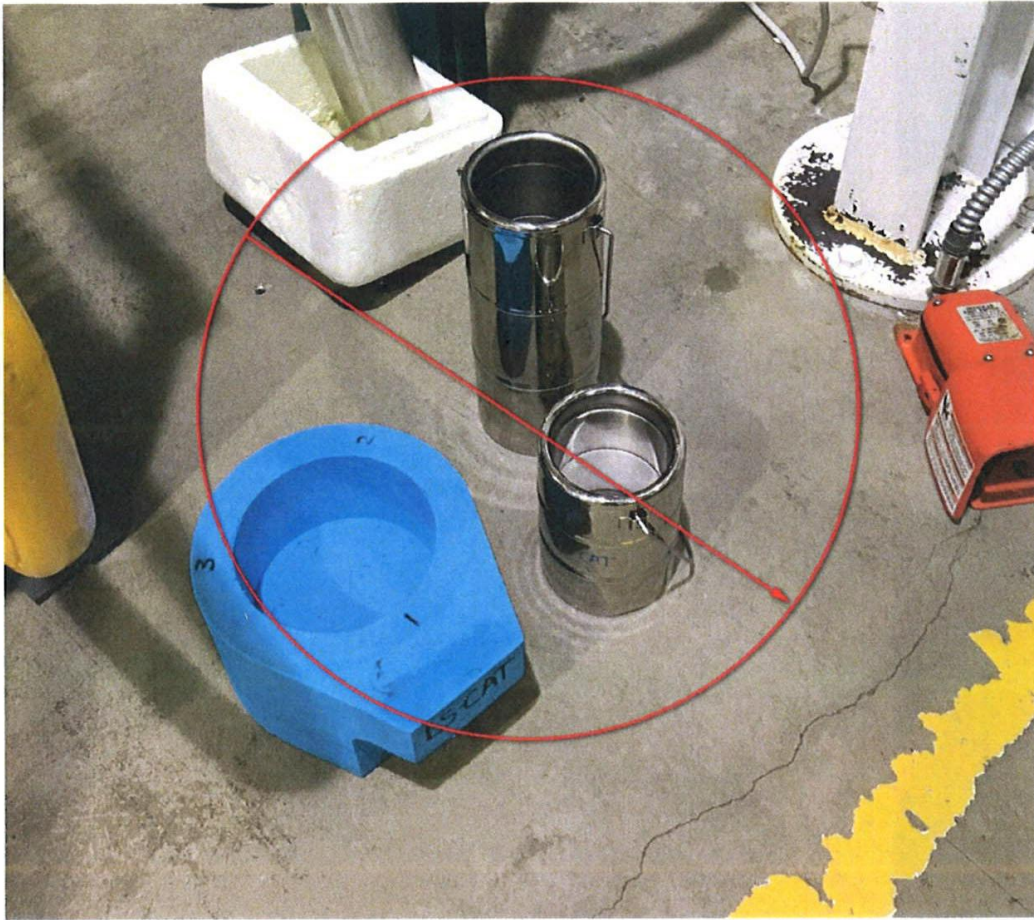
“FILL” light should be on. If not, turn the “STOP” button clockwise.

3. NECAT LN₂ control box

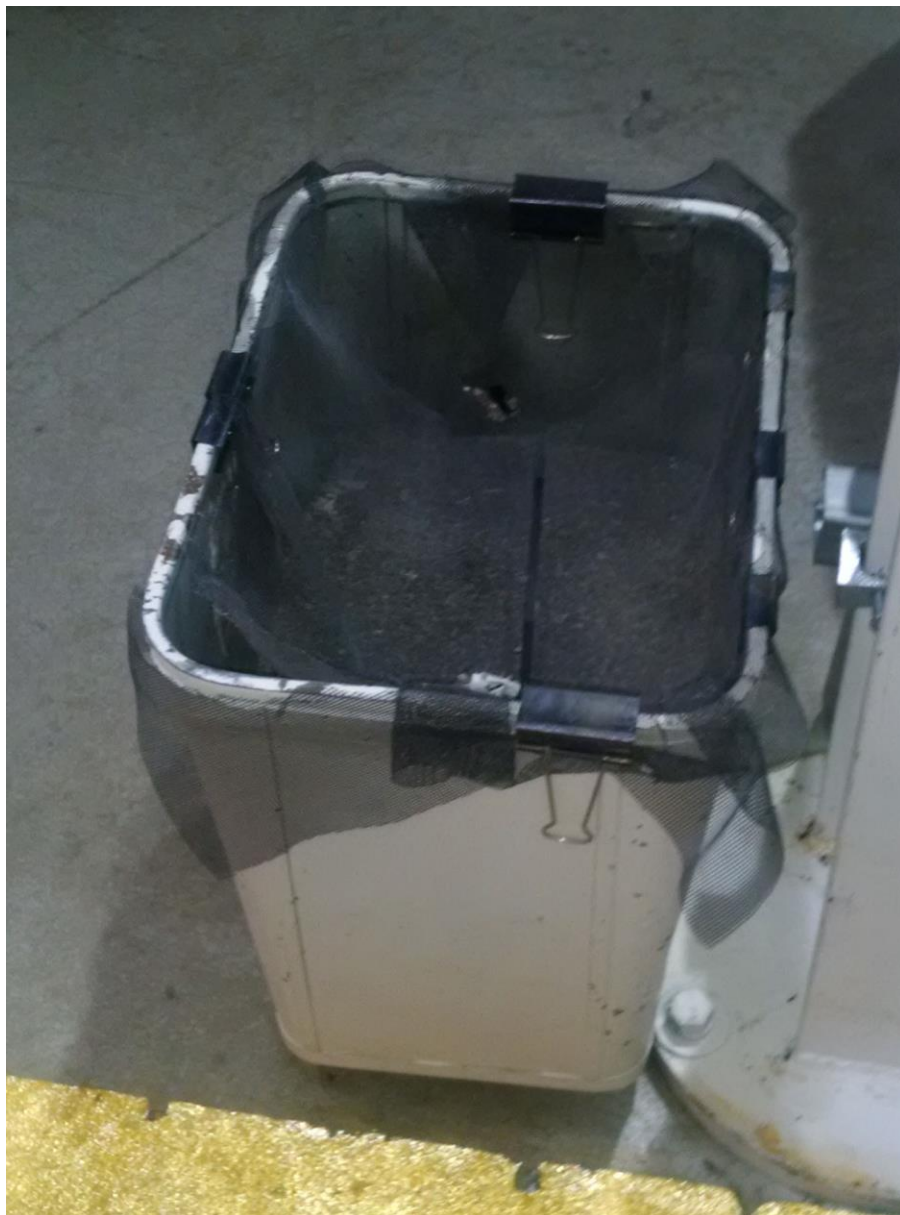


4. Fill the Dewar carefully as shown in the picture

Press “FILL” to start filling LN₂. Release the “FILL” button when Dewar is full.



5. **STOP.** Do not fill small flasks. Use Dewar only.



6. Dispose the extra LN₂ in the waste container carefully.

Emergency contacts:

APS Floor Coordinator 2-0101

N. Sukumar 2-0681 (Cell phone 630-328-3532)

Jim Withrow 2-0691 (Cell phone 815-791-4664)

Anthony Lynch 2-0683 (Cell phone 708-620-4190)