

IARC Heavy Assembly Building Hazard Awareness Training Handout

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Overview

The installation and start-up phases of the many different types of experiments and accelerators present many hazards. This document is intended to inform you of the potential hazards you may encounter in HAB and the proper precautions to take to prevent unsafe situations. Please read the entire document. This hazard awareness training is mandatory for all personnel who enter HAB or work at HAB routinely. It is valid for one year.

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1. Introduction

This training document outlines the hazards specific to the Heavy Assembly Building (HAB).

Access to HAB is restricted to authorized personnel in compliance with this written Hazard Awareness document. If you may be creating any hazards with your work, inform the HAB Coordinator (or designee) so that this information can be communicated effectively. A summary of these hazards is written on the HAB hazard board on the north side of the building near the crane control box.

If you find a situation in which you need advice, training, review or a decision regarding safety or safe operations, you should first go to your immediate supervisor. If you and your supervisor conclude that the matter goes beyond your own group, that you need assistance in resolving it, or that you need to arrange for safety training, you should contact the HAB Coordinator or designee. In the event of an emergency, you should call extension x3131 from any Fermilab telephone.

Environmental Safety & Health (ES&H) materials referenced in this document (FESHM, FRCM, and the Fermilab Engineering Manual) can be consulted for guidance on ES&H issues. These materials can be found on-line at this URL: <http://esh.fnal.gov/xms/>. Please also refer to Fermilab ES&H training you have received, including New Employee Orientation (NEO).

1.1. Planning Work at HAB

At HAB, if the job you are working on could affect the safety of others such as moving heavy objects overhead via the crane please notify the Building Manager, or the HAB Coordinator. A list of these jobs will be written on the hazard board located on the North wall of HAB. Plan work according to [FESHM](#), [FRCM](#), [Quality Assurance Manual \(QAM\)](#) and the [Fermilab Engineering Manual](#). For after hours, the two-man rule is in effect.

1.2. Visiting at HAB

At Fermilab there are procedures to follow with escorting offsite individuals. If you would like to escort an offsite individual or tour group around HAB, please inform the HAB Coordinator or HAB Building Manager prior to the visit. Please follow FRCM 941, FESHM 1110 and export-controlled procedures. For abbreviated guidelines no one under the age of 18 is permitted on the ground floor or pit area of HAB without approval. Always keep belongings behind the orange railing. Photos are not to be taken in certain areas of HAB, additional guidance can be given by the HAB Coordinator.

2. Radiation Hazards

There are potentially multiple experiments and small accelerators operating at any time. HAB ground floor and pit area, is posted as a "Controlled Area." For Controlled Areas, the Fermilab Radiological Control Manual states what necessary training is required. Generally, most radiation is produced from electron beam accelerators located within shielding caves.

These shielding caves have interlocked systems that include flashing lights. For the A2D2 cave a solid red and yellow light indicates that the machine is producing and accelerating beam. A solid green light indicates that the machine is not ready to produce beam and is safe to enter the enclosure.

For general practice, when performing tasks in these areas, please contact your supervisor or the HAB coordinator with any questions you may have.

3. Hazards Associated with Operating Machinery

3.1. Cranes and Forklifts

Improper use of certain equipment, such as cranes and forklifts, can endanger people working in the area as well as material being moved. Inside HAB there is an overhead crane. On the trolley, there is 50 Ton primary hoist, and a 10 Ton auxiliary hoist. The crane poses many different hazards to the building. The crane disconnect is in the southwest corner of HAB. It should be locked out when not in use. The crane controller is position on the North wall of HAB along the rigging equipment.

Operators of cranes and forklifts must complete operator training and renew this training every three years. Operators must clear personnel from the area of the lift and warn others of approaching loads. All personnel are prohibited from the area near or under any suspended load. Personnel conducting or in the vicinity of overhead lifts or lifts that have the potential to contact the head must wear hard hats and safety shoes. There is a series of IARC provided hardhats to be temporarily used in the case the crane is being operated. The location of the hard hats is at the bottom of the two stairwells that lead into the pit floor. Procedures for crane use can be found in [FESHM 10100 Overhead Cranes and Hoists](#) and [FESHM 10140 Mobile Cranes](#). When the overhead crane is in use to load/unload materials from the loading dock, no one shall be under the loading dock. Crane operators are responsible for clearing personnel from the area of the lift.

Personnel lifts, scissors-lifts and articulating boom lifts have been used inside HAB on prior occasions. These machines may require individual training, see your supervisor for any additional questions. At HAB please coordinate activities involving these machines with the HAB Coordinator or Building Manager.

3.2. Tech Shop Equipment

HAB has a small Tech Shop in the Southeast corner of the building, right next to the flammable storage cabinet. Along with Fermilab Tech Shop Safety Training, access to the HAB Tech Shop must be granted by the HAB Coordinator or Building Manager.

4. Cryogenic Hazards

Anyone who may handle large (160 liter) dewars must complete [Large Portable Liquefied Gas Dewar Handling \[FN000475\] Training](#). The general area of HAB is an ODH-0 area, however there are only two small areas where it is ODH-1. These areas are on the diving board, and below the cryo plant. This means there is no special ODH training required to enter HAB building, but all personnel must exit the hall if the whooping and strobe alarms go off. The main assembly area is in the East parking lot along the berm.

5. Confined Spaces and Limited Access Areas

Confined spaces are locations in which hazards, such as poor illumination, difficult emergency escape and ODH, can be intensified. A written permit and [Fermilab Confined-Spaces \[FN000003\] Training](#) is required for access to any confined space. Additional policies and procedures regarding access to confined spaces can be found FESHM 4230 Confined Spaces.

6. Static Magnetic Fields

The primary hazard associated with static magnetic fields is difficulty handling ferromagnetic items. There is a rotational force causing objects to align with field lines. In addition, there can be a translational force that pulls objects toward the source of a magnetic field. For more information please see [Fermilab Environmental, Safety and Health Manual \(FESHM\) 4270](#).

Mu2e Transport Solenoid Test Stand while in operation has a potential of creating a 5 Gauss field along the outside of its cryostat vessel. Appropriate "Danger Magnetic Field Hazard" posting signs are

fixed to the enter way doors of the pit area. Additional signs surround the platform along with a painted yellow line around the test stand. Also, in the event of an emergency, there are emergency stop switches around the platform. A light tree indicates the status of the magnetic field.

The Green light indicates that the power supply is disconnected, the Orange light indicates the power supply is connected and the solenoid current is low (< 20 A). The Red light indicates the power supply is connected and the solenoid current high (> 20A) and a magnetic field is being created.

7. Emergencies

Call ext. 3131 in the event of an emergency, such as personnel requiring medical treatment for any reason. Stay on the phone until the emergency operator indicates that s/he has all the necessary information, including your name, location and nature of the emergency. Do not attempt to bandage another person or clean any bodily fluids from another person's injury.

When evacuating any area, proceed to the designated assembly point and wait there until the 'all clear' signal is given. If you must leave and can't wait for the 'all clear', tell your supervisor or an Emergency Warden. Rescue attempts will be made by the Fire Department if someone is unaccounted-for and believed to be in an unsafe area (e.g., burning structure, oxygen deficient area). If you notice that a fellow worker is missing during an emergency, immediately report this to an Emergency Warden, the Incident Commander (Fire Dept.) or the Fire Chief.

7.1. Fire Alarm

The fire alarm is a steady alarm that may be accompanied by a flashing strobe light. It means that smoke or fire has been detected in the area. Exit via the closest exit door; gather at the emergency assembly area, located in the parking lots to the East of HAB (see Figure 1).



Figure 1. Aerial view of OTE and HAB with Emergency Assembly Area location indicated via red 'X'.

7.2. VESDA

HAB VESDA system is broken into three zones, one in the collision hall, and two for the East and West Highbay areas. All three zones are controlled through a panel in the east atrium. When work is to be conducted which could generate smoke or dust in the building, a request shall be made to the HAB Coordinator or the Building manager prior to following [FESHM 6020.2](#).

7.3. ODH Alarm

The ODH alarm is a whooper alarm along with red flashing lights positioned in the pit and at the ground level. Once the alarm activates, it indicates an oxygen deficiency hazard (ODH) or another hazardous atmosphere. Exit via the closest exit door; gather at the emergency assembly area, located in the parking lot to the East of HAB (see Figure 1).

7.4. Power Outage

In the event of a power outage, the occupants of the HAB pit are asked to leave the area immediately. Due to a power outage, the ODH fan may not come on in the event the oxygen level falls and creates an oxygen deficient area. Please exit to the nearest stairwell that leads to the ground floor.

7.5. Sitewide Emergency Warning System (SEWS)

This is a verbal communication system broadcast throughout all areas of the laboratory. It is used to notify personnel when hazardous conditions exist (such as inclement weather) and what protective actions to take.

It is very important that you respond to its warning tones and messages and that you follow the transmitted instructions. If the nature of the message indicates severe weather, promptly go to the designated shelter for your area. The designated shelter area for the HAB building is the Stairwell on the south side of the building near the elevator. Remain in the shelter until given directions, via the safety alert system, that it is safe to exit.



Figure 2: Stairwell in the HAB Building for SEWS Emergencies

8. Miscellaneous

The following describes some additional general hazards and work rules which exist within the facilities:

- Smoking is permitted outdoors only and at least 15 feet away from entrances.
- Janitorial personnel do not service this facility - you must clean up after yourself.
- It is always preferred that people not work alone. When this is impractical, workers should at least ensure that another person, such as their supervisor, is aware of when and where they are working, and they should arrange to periodically check-in with that person. This is especially important for work during off-hours. Also note that for some types of jobs, explicit "two-man rule" requirements may exist.
- Keep the roll up doors closed as much as possible to prevent stressing the Heating, Ventilation and Air Conditioning (HVAC) system.
- Check the bulletin board on the North side of the building near the crane controller. Here you will find information about the day's activities.