

# Liquid Argon Test Facility (LArTF) Hazard Awareness Training Handout

[PDLAR001/CB/01]

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## Overview

The operations phase of the MicroBooNE experiment still presents many hazards. This document is intended to inform you of the potential hazards you may encounter in the LArTF and the proper precautions to take to prevent unsafe situations. Please read the entire document, and complete the [online quiz](#). This hazard awareness training is mandatory for all personnel who enter LArTF or work at LArTF routinely (contact the [Facility Manager](#) to be added to the LArTF access list). This training is valid for two years.

## 1. Introduction

This training document outlines the hazards specific to the LArTF and the MicroBooNE experiment.

If you find a situation in which you need advice, training, review or a decision in regards to safety or safe operations, you should first go to your immediate supervisor/spokesperson. If you and your supervisor/spokesperson 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 Neutrino Division (ND) [Division Safety Officer \(DSO\)](#). In the event of an emergency, you should call extension 3131 from any Fermilab telephone (630-840-3131 from a cell phone).

Environmental Safety, Health & Quality (ESH&Q) materials referenced in this document can be consulted for guidance on ESH&Q issues. These materials can be found on-line at this URL: <http://eshq.fnal.gov/atwork/>

## 2. Cryogenic Hazards at LArTF

In general, operation of the cryogenics system does not involve the handling of cryogenics – contractors handle the delivery of liquid nitrogen and liquid argon to the designated storage dewars located outside the building.

During operations, the pit and platform levels have an ODH-1 rating. The surface level and stairwells have an ODH-0 rating.

To access ODH-1 areas, you must follow the two-person\* rule and obtain approval to work in those areas from the Run Coordinator, or designee. Upon approval and verification of ODH training (and medical clearance) completion, the Run Coordinator (or designee) will give you an access code and access instructions. Use the access code to open the key tree. Remove a key and place your ID badge in the tree. Get an oxygen monitor and take it with you. [NOTE: If working in an area where you may not be able to quickly access the stairwell in the event of an emergency (e.g. working under the platform on the catwalk, on the scaffolding, or on a lift); you must take a rescue air pack with you.] After leaving the ODH-1 area, return your oxygen monitor and key to the key tree and retrieve your ID badge.

*\*Two-person rule: Anyone doing work at LArTF must do so with a fellow person. If one person will be accessing the platform level, the second person may remain on the ground level as long as they maintain a clear line of communication with the person on the platform level. If accessing the pit level, two persons are needed to access the pit.*

Leaks in valves or other connections may occur; such leaks can show as a persistent fog. If such a fog is observed, all those in LArTF must exit and the cryogenics support group informed of the problem.

## 3. Confined Spaces and Limited Access Areas at LArTF

Access to the ODH-1 areas (pit and platform levels) requires [O.D.H. Training \[FN000029\]](#) and medical exam.

If working in an area where you may not be able to quickly access the stairwell (e.g. on the catwalk platform, on the scaffolding, or in a lift), carry a rescue air pack with you.

The catwalk under the platform is considered a confined space, but does not require a permit to enter as long as your work does not introduce new hazardous conditions to the space (contact the [DSO](#) if unsure if your work will introduce new hazards). Access under the platform grating requires use of fall protection. Confined Space training

and Fall Protection training are required to access this area. Personnel must also read and sign the written hazard analysis. Contact the [Facility Manager](#) or [DSO](#) for assistance in arranging this work.

The LArTF sump pit is a confined space that requires a confined space permit in order to enter. Contact [ESH&Q Confined Space personnel](#) or the [DSO](#) for permit approval.

## **4. Emergencies at LArTF**

**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 of 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.

### **4.1. Fire Alarm (steady alarm)**

Upon activation of the fire alarm, immediately evacuate the building and gather at the emergency assembly area, located in the parking lot near the MiniBooNE enclosure.

### **4.2. ODH Alarm (whooper alarm)**

Upon activation of the ODH alarm immediately evacuate the building and gather at the emergency assembly area, located in the parking lot near the MiniBooNE enclosure.

### **4.3. Miscellaneous Alarms**

Various other alarms exist throughout the building to provide other warnings (e.g. the ODH fan is not functioning, the emergency back-up generator is not functioning, the sump pump has a failure, etc.). If you notice any other alarm or flashing red light, assemble on the surface level and contact the Remote Operating Center (ROC), ext. 6967. Do not attempt to enter the platform or pit levels until the source of the alarm has been verified.

### **4.4. Sitewide Emergency Warning System (SEWS)**

Upon notification of a severe weather warning, follow directions to move into the designated shelter, which is located in the lower levels of either of the stairwells of LArTF. To access while the gate is closed, use the emergency key in the glass-fronted key box (Break the glass with the provided tool. Leave the key in the gate for any others who may need to enter the shelter). If already on the pit or platform level, move into the stairwells and get to the lower levels. Remain there until an all-clear is given. Notify the [DSO](#) after using the emergency key.

## **5. Hazards Associated with Working at Heights at LArTF**

Fall protection is required when working with aerial lifts (boom or articulating). Fall protection is also required when accessing space under the decking of the platform, or when using the scaffolding. Hazard analyses are available for these tasks, and must be reviewed prior to performing any work that requires accessing either areas.

Access to the built-in catwalk level of the platform is made by lifting out platform decking panels and stepping down. Once the decking panel has been removed, barriers must be constructed to warn others of the floor opening. The lower ledge has toe-kicks and guardrails; fall protection is not required.

Any ladder use on the surface or platform levels where the ladder is placed within a ladder-height distance from any guardrail must be used with fall protection.

Only individuals who have completed [Fall Protection Orientation \[FN000304\] Training](#) may use fall protection equipment.

## **6. Hazardous Energy at LArTF**

The MicroBooNE Experiment utilizes a high-voltage feed-through. The high-voltage cable is labeled “high voltage” and is not to be jarred.

## **7. Radiation Hazards at LArTF**

LArTF is located along the Booster Neutrino Beam (BNB). The beam neutrinos and interactions resulting from them do not pose a radiation hazard and LArTF is not a Radiation Area when the BNB is operating. GERT is the only radiation safety training required to enter this facility.

There are two Class IV lasers in use on the MicroBooNE experiment. Only trained and qualified individuals may access the lasers.

A source box is available in the building, and may only be accessed by trained individuals who have authorization from the Source Monitor.

## **8. Miscellaneous**

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

- 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.
- Appropriate PPE must be worn to protect against hazards. Closed toe shoes are required at all times when in LArTF. Hard hats must be worn when working in the pit or on the built-in catwalk under the platform. Additional PPE needs must be reviewed during the work planning/job walk-down.
- Before accessing the ODH area, call the Remote Operating Center (ROC) at (937)582-6663.