

Bigelow Laboratory Hazardous Energy Control (Lockout) Program

This program is designed to protect Bigelow employees from injury while servicing and maintaining equipment. Lockout is designed to control hazardous energy (kinetic, potential, electric, chemical, thermal, hydraulic, pneumatic, and gravitational) prior to equipment repair, adjustment, or removal (ref. OSHA Standard 29CFR 1910.147).

Responsibility

The Facility Director is the designated coordinator for this program, responsibilities include:

- Implement and enforce this program
- Provide Hazardous Energy Control training for employees
- Maintain current lists of certified employees
- Maintain a current list of equipment that falls under the Hazardous Energy Control program
- Maintain an adequate supply of padlocks and DANGER tags
- Conduct an annual inspection and review

Compliance with this Program

Only authorized, qualified employees are certified to lockout equipment or machinery.

Documented training is required annually, and includes:

- Review of general and specific procedures
- Location and use of specific procedures
- Procedures to use if questions arise
- Training records will be kept for employees covered under the standard.

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. Authorized employees are required to perform the lockout in accordance with specific procedures devised for each piece of equipment. All employees, upon observing a piece of equipment which is locked out shall not attempt to start, energize or use that machine or equipment. No other employees or personnel may remove locking devices.

Procedure for each piece of equipment

- (1) Perform lockout survey to identify energy sources and switches, identifying the type and magnitude of energy the equipment uses, its hazards, and the methods to control it.
- (2) Develop a written lockout procedure describing energy sources, location and types of disconnects, special hazards, and any special procedures. This procedure must be reviewed each time to ensure proper lockout.
- (3) Qualified personnel are each assigned a lock (or locks, if multiple shut-offs are required) with one key, hasp and tag. All locks and hasps shall be uniquely identifiable to a specific employee. For tasks requiring more than one employee, each must place their own lock on the device(s) being locked out.

Standard Operating Procedure for General Lockout

- (1) Before work begins on a piece of equipment, the following procedures will be utilized to place the equipment in a neutral or zero mechanical state:
 - Notify the Lab Manager prior to beginning lockout.
 - Notify all affected employees that servicing or maintenance is required on a piece of equipment and that the equipment must be shut down and locked out to perform the servicing or maintenance.
- (2) Equipment must be shut down using specific, orderly procedures for each specific machine. Move switches or panel arms to OFF or OPEN and close all energy isolating devices so energy is isolated or disconnected from equipment.
- (3) Authorized personnel shall affix the Lockout devices to energy-isolating devices in a manner that will hold the energy-isolating device in the "Safe" or "Off" position.
- (4) All stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
- (5) Verify that energy isolation is complete by following normal start-up procedures (after ensuring that no one will be placed in danger). After test, return all controls to neutral/off positions.
- (6) Where re-accumulation of stored energy to a hazardous level is possible, verification of isolation must be monitored until servicing is complete. The machine or equipment is now locked out.

Standard Operating Procedure for Release from Lockout

When the maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken.

- (1) Thoroughly check the equipment and work area to ensure that nonessential items (tools, etc) are removed and that personnel are safely positioned or removed from the area.
- (2) Ensure that all guards have been replaced and all safety interlocks reactivated (if so equipped).
- (3) Verify that the controls are in neutral.
- (4) Remove all Lockout devices. NOTE: Each lockout device may only be removed by the employee who applied it, except in certain circumstances, when the Manager may remove the device after they have ensured that all safeguards are in place and have notified the employee who place the lockout device prior to its removal.
- (5) The equipment may then be re-energized following normal start-up procedures.

Program Inspection and Review

At least annually, the program coordinator (Facility Director) will verify the effectiveness of the energy control procedures. These inspections shall provide for a demonstration of the procedures and may be carried out through random audits and observations.

The Facility Director shall review the Hazardous Energy Control Procedure with all authorized employees and observe the use of the procedure. This inspection will be certified and documented by the inspector using a Hazardous Energy Control Lockout Program Inspection Form.

The safety officer will certify that the prescribed inspections have been performed. Any deficiencies will be corrected immediately, either by modification of the procedure, retraining of employees, or a combination of both.

Outside Contractors

Outside personnel or contractors involved in lockout equipment must submit their energy control procedures, in writing, to the Program Coordinator (Facility Director). All affected employees must be trained in and familiar with the contractor's submitted procedure. To protect our employees, the contractor's work area will be isolated and access by our employees will be restricted. If this is impractical or impossible, the lab manager must assure the contractor's compliance with proper work procedures, energy isolation procedures, and compliance.

Contractors failing to adhere to the provisions of the OSHA Hazardous Energy Control standard will be asked to terminate their work until their program is brought into compliance.

List of qualified employees: Training completed 10 June 2026

Michael Erwin	Mickey McBride
Jay Wheeler	Kim Knowlton
Adam Smart	
Nikolai Blackman	
Mike Hills	

