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C-A OPERATIONS PROCEDURES MANUAL

7.1.39 Cryogenic Group Lockout/Tagout

Text Pages 2 through 8

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
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Approved: _____ *Signature on File* _____
Collider-Accelerator Department Chairman Date

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7.1.39 Cryogenic Group Lockout/Tagout

1. Purpose

1.1 To provide instruction on the use of lockout/tagout within the Cryogenics (Cryo) Group. This procedure is to be used in accordance with ESH Procedure 1.5.1, Lockout/Tagout Requirements.

1.2 Definitions

1.2.1 Lockout/Tagout (LOTO) – Administrative and physical method used to protect personnel and equipment during ongoing work. This method ensures that a system/component is placed in a safe condition and is prevented from being operated or energized while work is in progress.

1.2.2 Operate – To change the state of a component: e.g., open/close or start/stop.

1.2.3 Energize – To activate, pressurize or electrically energize a system/component.

1.2.4 Red Tag – Hold Tag or Danger Tag (BNL form BNL F 2791A) used as an administrative control to prevent a system/component from being operated or energized.

1.2.5 Technical Supervisors – Cryo Group Electronic Lead Supervisor and Mechanical Lead Supervisor.

1.2.6 Shift Supervisors – Cryo Group Shift Supervisors and, for the purpose of LOTO, the Technical Supervisors.

1.2.7 Cognizant Shift Supervisor – Current operating Shift Supervisor or Shift Supervisor responsible for a particular job.

1.2.8 Operator – Cryo Mechanical Technician or Electronic Technician.

1.2.9 Cryo LOTO Log Book - Logbook that will be used to record all information for personal LOTO and the general information for Shift Supervisor LOTO. The log must be a bound book with consecutively numbered pages (see attachment 8.1 for logbook format).

- 1.2.10 SS Index Numbers –Numbers used to identify the Shift Supervisor LOTO sheets (see attachments 8.2 and 8.3). The SS index numbers are produced from cryo LOTO logbook, the numbers are sequential during a given calendar year (e.g., 00-001, 00-002) where the first two digits indicate the year.
- 1.2.11 Lockout Lock – “Master Lock” padlock with distinctive red band that has been issued by the C-A Safety Office and is entered in the C-A LOTO Lock Database. The lock is used alone or in conjunction with blocking devices to physically prevent a component from being operated.
- 1.2.12 Assigned Lockout Lock – Lockout lock that is permanently assigned to an individual.
- 1.2.13 Cryo Group Lockout Lock – Lockout lock assigned to the Cryogenic Group. Can be signed out in the cryo LOTO logbook as a Shift Supervisor lock or as a personal lock.
- 1.2.14 Shift Supervisor Lockout Lock – Lockout lock signed out under a Shift Supervisor LOTO sheet. Defined in ESH 1.5.1 as group or operations lock.
- 1.2.15 Personal Lockout Lock – Lockout lock signed out from Cryo LOTO logbook by an individual. A Shift Supervisor may sign out a lockout lock as a personal lock.
- 1.2.16 Lock Box – Lockable box used to store the keys for active Shift Supervisor lockout locks. The lock boxes are numbered with number one being the Cryo Group General Purpose Lock Box, and the remainder being Cryo Group Case Specific Lock Boxes (see section 6 for their use).

2. Responsibilities

- 2.1 Cryo Section Head
- Ensures this procedure is implemented and that LOTO is performed in accordance with ESH Procedure 1.5.1.
- 2.2 Technical Supervisors
- Trained to level of “authorized responsible employee” as defined in ESH 1.5.1.
 - Directly implements this procedure and the requirements of ESH 1.5.1.
 - Maintains a standardized record of LOTO (Logbook, LOTO sheets etc.).
 - Conducts periodic review of records.

- Ensures Shift Supervisors and Operators are trained to level of “authorized employee” as defined in ESH 1.5.1.
- Trains Shift Supervisors and Operators on C-A required LOTO OJT.
- May implement Shift Supervisor LOTO.
- May implement personal LOTO.

2.3 Shift Supervisor

- Trained to level of “authorized responsible employee” as defined in ESH 1.5.1.
- Completed LOTO OJT training.
- May implement Shift Supervisor LOTO.
- May implement personal LOTO.

2.4 Operators

- Trained to level of “authorized knowledgeable employee” as defined by ESH 1.5.1.
- Completed LOTO OJT training.
- May physically install Shift Supervisor LOTO as instructed by the cognizant Shift Supervisor.
- May implement personal LOTO.

3. **Prerequisites**

- 3.1 If the LOTO qualifications of a Cryo Group Shift Supervisor or Operator have expired, that person cannot implement LOTO.
- 3.2 Cryo Group Shift Supervisors and Operators implementing LOTO must be knowledgeable of the facility and its current status.

4. **Precautions**

- 4.1 Prior to working on equipment, all sources of energy must be identified and isolated, stored energy must be released, the equipment must be tested/verified safe, and the equipment must be rendered inoperative by applying LOTO.

5. **Procedure**

5.1 General

- 5.1.1 Personal LOTO must only be removed by the individual who installed it. If that person is not available, the LOTO can only be removed in accordance with C-A OPM 2.14, “Removal of Locks and Tags by Others”.

- 5.1.2 Shift Supervisor LOTO is removed by the cognizant Shift Supervisor; this may be a different Shift Supervisor than the one who originally implemented the LOTO.
- 5.1.3 Cognizant Cryo Group personnel must perform the LOTO for any work done on Cryo Group equipment. For group LOTO, Cryo Group must have first lock on, last lock off. Others may place LOTO on top of Cryo Group LOTO. This includes application of LOTO on equipment or lock box.
- 5.1.4 If Cryo Group Shift Supervisors or Operators are working under a Shift Supervisor, personal LOTO may also be used, but is not required.
- 5.1.5 For ongoing Cryo Group work (others NOT involved), the General Purpose Cryo Group lock box is used. The keys for more than one Shift Supervisor LOTO sheet can be controlled by use of the General Purpose lock box.
- 5.1.6 For each Shift Supervisor LOTO that involves work by other groups, a case specific lock box must be used.

5.2 Personal LOTO Installation

- 5.2.1 Notify Cognizant Shift Supervisor that LOTO will be applied.
- 5.2.2 Obtain red tags and lock/locking devices.
- 5.2.3 Make LOTO logbook entry for each tag used. Fill out appropriate fields, "Shift Supervisor Index Number" field is not used (place N/A in this field).
- 5.2.4 Fill out red tag including stub. Position (e.g., open, closed, installed) of item being tagged shall be written on tag near "apparatus" line. Do not sign tag stub until tag is hung.
- 5.2.5 Ensure item to be locked/tagged is in the correct position (e.g., open/closed).
- 5.2.6 Attach lock/locking device and red tag. Cable tie (tie wrap) must be used to attach red tag.
- 5.2.7 Remove and sign tag stub.
- 5.2.8 Return stub to Cryo LOTO Box.

5.2.9 The key for the lockout lock is held by the person who installed the lock.

5.3 Personal LOTO Removal

5.3.1 Verify all work is complete.

5.3.1 Notify Cognizant Shift Supervisor LOTO will be removed.

5.3.2 Remove red tag and lock/locking device.

5.3.3 Return red tag to control room and staple stub to tag. Tag must be retained in the vicinity of Cryo Control Room for Technical Supervisor review. Once the Technical Supervisor review process is complete, both the tag and stub can be discarded.

5.3.4 Fill out “Date Cleared” and “Name” fields in LOTO logbook.

5.4 Shift Supervisor LOTO Installation

5.4.1 Obtain red tags and lock/locking devices.

5.4.2 Fill out “SS Index Number” field in Cryo LOTO logbook, enter “see Shift Supervisor LOTO Sheet” across the remaining installation fields.

5.4.3 Fill out appropriate fields of Shift Supervisor LOTO sheet.

5.4.4 Fill out upper portion of red tag, stub may be discarded or used as key ID tag. Position (e.g., open, closed, installed) of item being tagged shall be written on the tag near “apparatus” line. Name on tag will be “Cryo Shift Supervisor.” Enter SS Index Number in the bottom left corner of the “Reason” space.

5.4.5 Ensure item to be locked/tagged is in the correct position (i.e. open/closed).

5.4.6 Attach lock/locking device and red tag. Cable tie (tie wrap) must be used to attach red tag. The Shift Supervisor may assign other authorized Cryo Group personnel to install locks and red tags.

5.4.7 Cryo Group Shift Supervisor or Operator who physically installed the tags/locks fill outs “Date Applied” and “Applied by Initials” fields on the Shift Supervisor LOTO sheet.

- 5.4.8 Cognizant Shift Supervisor reviews the Shift Supervisor LOTO sheet to verify all red tags are hung and all keys are in the lock box (General Purpose or Case Specific Lock Box as appropriate). A Cryo Group lock is then installed on the lock box. The key for the lock box is placed in the Cryo Control Room key locker.
- 5.4.9 Cognizant Shift Supervisor signs the Shift Supervisor LOTO sheet and places it in the “active” section of the Shift Supervisor LOTO sheet binder.

5.5 Shift Supervisor LOTO Removal

- 5.5.1 Cognizant Shift Supervisor verifies that all work is complete.

Note:
If necessary, red tags/locking devices may be removed in phases. Authorization for removal must only be given for the red tags/locking devices that will actually be removed.

- 5.5.2 Cognizant Shift Supervisor authorizes removal of red tags by initialing “Authorized By” field on the Shift Supervisor LOTO sheet.
- 5.5.3 Remove red tags and locks/locking devices. The Shift Supervisor may assign other authorized Cryo Group personnel to remove locks and red tags.
- 5.5.4 Return red tags and locks to Cryo Control Room.
- 5.5.5 Fill out “Date Cleared” and “Cleared by Initials” fields on the Shift Supervisor LOTO sheet.
- 5.5.6 Cognizant Shift Supervisor verifies that all red tags and locks associated with this specific LOTO have been removed and signs the Shift Supervisor LOTO sheet. Once the Shift Supervisor verification process is complete, the red tag can be discarded.
- 5.5.7 Cognizant Shift Supervisor fills out “Date Cleared” and “Name” fields in LOTO logbook.

6. Documentation

- 6.1 The active Cryo LOTO logbook will be maintained in the cryo control room. Refer to 8.1 for Cryo LOTO Logbook format.

- 6.2 Shift Supervisor LOTO sheets will be used to record the details of the shift supervisor LOTO. A loose-leaf binder for Shift Supervisor LOTO sheets will be maintained in the Cryo Control Room (see 8.2). Original Shift Supervisor LOTO sheets must remain in the Cryo Control Room, copies may be made for use in the field.
- 6.3 A Technical Supervisor shall review the LOTO documents annually (near the end of the calendar year), but can review them more often as practical. The review shall be documented by entry in LOTO logbook. Entry shall include statement that review of documents was completed, date of review, signature, and life number of reviewer.

7. References

- 7.1 [ESH 1.5.1, "Lockout/Tagout Requirements"](#).
- 7.2 [C-A-OPM 2.14, "Removal of Locks and Tags by Others"](#).

8. Attachments

- 8.1 [C-A-OPM-ATT 7.1.39.a, "Cryo LOTO Logbook Format"](#).
- 8.2 [C-A-OPM-ATT 7.1.39.b, "Shift Supervisor LOTO Sheet Form"](#).
- 8.3 [C-A-OPM-ATT 7.1.39.c, "Shift Supervisor LOTO Sheet Continuation Form"](#).