

ACCELERATOR DIVISION ES&H PROCEDURE

ADSP-05-1215

HP3DS and QP3
13.8 KV LOCKOUT/TAGOUT PROCEDURE

RESPONSIBLE DEPARTMENT ES&H

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REVIEW AND CONCURRENCE RECORD

REVIEWED BY Thomas K. Kobilarcik DATE 11/8/2019
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REVIEWED BY Chris Jensen DATE 11/8/19
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REVIEWED BY Joseph Pathiyil DATE 11/15/19
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Author	Description of Change	Revision Date
Joe Compton	Adjusted titles to reflect organizational changes. Added revision history. Corrected lockbox name to Transfer Hall. Removed the itemized clothing lists from NFPA 70E class requirements. Specified training needed for Lead Authorized Person. Added procedure training requirements in sections 8.1 and 8.2. Changed some grammar to help clarify. Added Appendix A.	10/25/2019

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1.0 **PURPOSE AND SCOPE**

The purpose of this Accelerator Division Safety Procedure (ADSP) is to outline and detail the conduct of LOCKOUT/TAGOUT (LOTO) for Group Lockout of the Tevatron 13.8 KV devices HP3DS and QP3.

2.0 **PERFORMANCE OF MAINTENANCE ACTIVITIES**

During maintenance/repair activities of the HP3DS and QP3 devices, the 13.8KV disconnects need to be locked out. The positive control point for Lockout/Tagout is at the Tevatron service building F4.

3.0 **THE NECESSITY OF WRITTEN LOTO PROCEDURE**

The need for a written LOTO procedure is due to the necessity to lock out an energy source in an area in which access is restricted to authorized personnel only. The HP3DS and QP3 devices are fed through MOS 89. However the exposed bus extends into the Transfer Hall enclosure requiring a separate LOTO procedure for access into the Transfer Hall enclosure.

4.0 **RESPONSIBILITIES**

4.1 **OPERATIONS DEPARTMENT HEAD**

The Operations Department Head shall develop and maintain a list of Lead Authorized Personnel and coordinate their training.

In addition, the Operations Department Head will ensure that the Lead Authorized Personnel implementing this procedure utilize an appropriate lockout form which is developed and maintained by the Operations Department and the ES&H Section and approved by the ES&H AD Division Safety Officer prior to use.

4.2 **LEAD AUTHORIZED PERSONNEL**

The role of the Lead Authorized Person is to properly Lockout/Tagout both disconnects which de-energizes the 13.8 KVAC to the HP3DS and QP3 power supplies. The completion of the Lockout/Tagout is to be documented using a lockout form developed and maintained by the AD Operations Department and the ES&H Section and approved by the ES&H AD Division Safety Officer. The Lead Authorized Person shall carry the approved lockout form and each applicable step shall be checked off as they are performed. A copy of the completed form shall be placed in the Main Control Room Electronic Log (e-log). Completed original forms shall be maintained for one calendar year.

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The Lead Authorized Personnel shall be from the Accelerator Operations Department who are authorized in writing by the Operations Department Head.

Authorized Personnel, who have the necessary knowledge and current Lockout/Tagout training required by FESHM chapter 2100, shall conduct lockout of the Transfer Hall Group Lock Box.

5.0 THE STEPS OF LOCKOUT/TAGOUT PRIOR TO MAINTENANCE ACTIVITY

Upon desiring to perform LOTO on the HP3DS and QP3 devices, the MCR Crew Chief shall designate a Lead Authorized Person from a list of such named personnel maintained by the Operations Department Head.

5.1 **Prepare:** The Lead Authorized Person shall review this written procedure if necessary and obtain a copy of the approved lockout form. (Copies will be kept in a lockout binder on the Duty Assistant's desk.)

5.2 **Notify:** Notification shall be given to personnel deemed appropriate by the MCR Crew Chief.

5.3 **Shut Down:** The Lead Authorized Person shall check that the HP3DS and QP3 power supplies are off. At the F4 Service Building, lock out the disconnects for the power supplies by performing the following:

- a. Note that the breaker status light indicates open and place the AC controller into 'lockout' for each power supply.
- b. If MOS 89 has not been switched off using ADSP-05-1214, operation of the disconnects in this step requires NFPA 70E Class 2 activity. Open the 13.8KV disconnect for each power supply.
- c. Turn and remove the top Kirk Key from the actuator for each power supply locking the HP3DS and QP3 13.8KV disconnects in the open position.

5.4 **Verify:** The Lead Authorized Person shall verify that all three knife switchblades are open for **both** devices (**Both must be visually verified, take a flashlight**). The Lead Authorized Person shall indicate on the approved lockout form the accomplishment of this step.

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- 5.5 **Lock and Tag Out:** Return to the Main Control Room and place both Kirk Keys in the Transfer Hall lockbox. The Lead Authorized Person shall attach a **BT-5** padlock (MCR Crew Chief lock) to the lockout box. A copy of the completed lockout form shall be entered into the MCR e-log.

6.0 **SPECIAL REQUIREMENTS FOR SHIFT/PERSONNEL CHANGE**

If the accelerator enclosure activities continue beyond a shift, the next MCR Crew Chief assumes the responsibility and authority of the off-going MCR Crew Chief for this group lockout.

7.0 **THE STEPS FOR RETURN TO SERVICE**

The MCR Crew Chief or Lead Authorized Person must coordinate the following steps prior to returning the equipment to service after service or maintenance activity

- 7.1 **Check Equipment:** Check the MCR lockbox and ensure that all personnel have removed their locks and tags.

- 7.2 **Check Work Area:** Check that the Transfer Hall enclosure is secure and all keys are returned.

- 7.3 **Notify:** The MCR Crew Chief or Lead Authorized Person shall notify appropriate personnel that they are ready to reenergize.

- 7.4 **Remove Padlocks and Tags and Reenergize:** The MCR Crew Chief or Lead Authorized Person shall remove the Crew Chief locks from the Transfer Hall group lockbox and designate a lead authorized person to return the Kirk Keys to HP3DS and QP3 disconnects. If MOS 89 has not been racked out using ADSP-05-1214, operation of the disconnects in this step requires NFPA 70E Class 2 activity. Upon arrival at the HP3DS and QP3 disconnects, the Lead Authorized Person shall insert the Kirk Keys and turn them to allow operation of the disconnects. The Lead Authorized Person shall close the disconnects and verify the AC controllers are out of 'lockout'.

This completes the requirements for returning the equipment to service.

8.0 **PROCEDURE TRAINING REQUIREMENTS**

Initial training shall be coordinated by the Operations Department Head. The time interval for re-qualification will be every year in accordance with Laboratory procedures.

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8.1 All personnel performing this procedure are required to be trained in Lockout/Tagout Level 2 (FN000212 / CR).

8.2 All personnel performing this procedure are required to be trained in Electrical Safety in the Workplace (NFPA 70E) (FN000385 / CR).

9.0 **DISTRIBUTION**

An electronic controlled copy of this procedure is available at:
http://ad-esh.fnal.gov/ad_adsp.html

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APPENDIX A: ACCELERATOR DIVISION DEPARTMENTAL PROCEDURE WRITTEN LOTO DEVELOPMENT AND REVIEW RESPONSIBILITIES

This appendix describes the responsibilities for drafting and reviewing written procedures used for exposed bus Lock Out/Tag Out (LOTO) with the purpose of accessing accelerator and beamline enclosures.

These procedures are formalized as Accelerator Division Safety Procedures (ADSP) to establish ESH&Q policies for implementation by AD departments¹, in this case as a written LOTO procedure, to control access to AD facilities as needed to protect the health and safety of personnel².

The scale of the systems included in the procedures involve multiple organizational units having only partial knowledge of or responsibility for the overall system. The written LOTO procedure shall be drafted³ and reviewed⁴ by knowledgeable employees from each D/S/P that owns, uses, maintains, or services equipment directly affected by or used to execute the written LOTO procedure, including Energy Isolating Devices and approved by a line manager at the department head level or higher (or designee).

The AD OPS department provides the authorized and lead authorized employees, performs the inspector component of the training and maintains the training of the lead authorized personnel.

The AD EES department acts as the knowledgeable employee for magnet power supplies from the AC service LOTO Energy Isolation Device, through the power supply and to the power supply terminals. In some instances, FESS maintains the LOTO Energy Isolating Device and is the knowledgeable employee for that device.

The department(s) responsible for the enclosure act as the knowledgeable employee for the loads in the beamline enclosure.

The approval of the line manager is recorded in the REVIEW AND CONCURRENCE RECORD of the ADSP indicating that they have reviewed the procedure, provided input for their area of knowledge and recognize their responsibilities as users, owner, maintainers or servicers of a portion of the systems used in the written LOTO procedure.

APPROVAL:  DATE 11/15/2019
Mike Lindgren
Accelerator Division Head

¹ ADAP-01-0001 3.1.2c

² ADAP-01-0001 3.1.2d

³ FESHM 2100 5.7

⁴ FESHM 2100 4.4

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