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CP3-HS-2010 FRev. 3	**TITLE**: Instructions for Lockout/Tagout	Page 1 of 44

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REVISION/CHANGE LOG

Revision/Change Letter	Description of Changes	Pages Affected	Date of Revision/Change
FR0	Bluesheeted document from FPDP.	ALL	9/22/17
FR1	Incorporate Bluesheet comments and change criteria for Steps 5.1.2 and 6.1.3.	ALL	11/29/17
FR2	General Revision to add hazard threshold table as Appendix L, clarify exceptions to this procedure, and make various editorial changes and clarifications	ALL	4/26/18
FR2A	Deleted the definition of unattended.	28	6/27/18
FR3	Administrative changes to use and source references, various administrative clarifications, and addition of language on LOTO logs.	ALL	12/27/18

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure covers applicable parts of Occupational Safety and Health Administration (OSHA) 1910 and 1926 regulations, applicable parts of National Fire Protection Association (NFPA) 70E standard, and the U. S. Department of Energy (DOE) O 422.1, *Conduct of Operations*, as identified in 10 Code of Federal Regulations (CFR) § 851, *Worker Safety and Health Program*.

1.2 Scope

1.2.1 This procedure applies to all forms of energy, potential and kinetic, including electrical, hydraulic, pneumatic, mechanical, chemical, toxic, and other potentially hazardous sources. Appendix L – *Hazard Threshold Guidance Table* is a tool to assist in determining when the LOTO process is mandatory or requires further review.

1.2.2 The Lockout/Tagout (LOTO) process is to be utilized to remove and control hazardous energy during the servicing and maintenance of machines and equipment in which the unexpected energization or start- up of the machines or equipment or release of stored energy could harm employees. It is **NOT** to be used for administrative or operational control of equipment.

1.2.3 This procedure applies to Deactivation &Remediation (D&R) contractor personnel, Swift and Staley Team (SST) personnel, contracted labor personnel, and contractors or subcontractors working at PGDP. The SST deltas from the D&R contractor terminology are identified in Appendix F, *SST DELTAs with Procedure CP3-HS-2010*.

1.2.4 This procedure applies to D&R Contractor personnel, SST personnel, contracted labor personnel, and contractors or subcontractors working at D&R project protected during LOTO activities involving DUF_6 equipment.

1.2.5 Where electrical hazards are present, workers shall refer to and comply with CP3-SM-0019, *Electrical Safety Guidelines.*

1.2.6 This procedure provides instructions for the following:

A. Safeguards to be taken to control hazardous energy before the performance of work where unexpected energization, start-up of machines or equipment, or where release of stored energy could cause injury to any personnel during servicing and/or maintenance of machines and equipment.

B. The LOTO of energy sources and the use of LOTO (Permit Required and Non‑Permitted).

EXCEPTIONS:

A. This procedure does **NOT** apply to hot-tap operations involving transmission and distribution systems for substances, such as gas, water, steam, or petroleum products when performed on pressurized pipelines, provided that ALL of the following three conditions are met:

1. Continuity of service is essential.

2. Shutdown of the system is impractical.

3. Documented procedures are followed, and special equipment is used which will provide proven effective personnel protection.

B. This procedure does **NOT** apply to the issuance and release of permits between power suppliers, off-site utilities and on-site Power and Utilities. This procedure does **NOT** apply to DUF_6 personnel performing LOTO activities on PGDP D&R Contractor equipment for DUF_6 personnel protection.

C. This procedure does **NOT** apply to work on cord and plug connected electric equipment for which exposure is controlled by unplugging the equipment and where the plug is under the control of the employee performing the servicing or maintenance.

D. **If** there will be **NO** increased exposure to electrical burns or to explosion due to electric arcs, **then** live parts that operate at less than 50 volts to ground need **NOT** be de-energized. (A hazard evaluation by a qualified person may be required).

E. This procedure does **NOT** apply if the employee is performing minor tool changes or other minor servicing activities that are routine, repetitive, and integral to production, and that occur **during** normal production operations (see definitions). In these cases, employee must have effective, alternative protection. Consult Safety and Health if needed to make this determination.

F. This procedure does **NOT** apply if the hazardous energy has been isolated using permanent air gaps (such as, cutting wires and conduit leaving a gap that requires a modification to repair or re-establish the hazardous energy source).

2.0 REFERENCES

2.1 Use References

- CP3-SM-0017, Measuring and Test Equipment
- CP3-SM-0019, *Electrical Safety Guidelines*
- CP3-SM-0049, *Installed Plant Instrumentation Measuring and Testing Equipment*
- CP3-SM-1101, *Work Package Development*
- CP4-SM-0010, Verifying De-Energized Electrical Equipment

2.2 Source References

- 10 CFR § 851, Worker Safety and Health Program
- 29 CFR § 1910.147, The Control of Hazardous Energy (Lockout/Tagout)
- 29 CFR § 1910.333, Selection and Use of Work Practices

- CP2-TR-0100, Training Program
- CP3-HS-2004, Job Hazard Analysis
- CP3-OP-0012, Independent Verification
- CP3-OP-0207, Use of Procedures
- CP3-RD-0010, *Records Management Process*
- CP3-SD-0001, *Air-Gap Identification and Verification*
- DOE O 422.1, Conduct of Operations
- DOE STD 1030-96, Guide to Good Practices for Lockouts and Tagouts
- NFPA 70E, 2018- Standard for Electrical Safety in the Workplace

3.0 COMMITMENTS

None

4.0 RESPONSIBILITIES

See Section **6.0**

5.0 GENERAL INFORMATION

5.1 General Requirements

5.1.1 Systems that operate at high temperatures (for example, greater than 200°F for a liquid and/or gas) or high pressures (for instance, greater than 500 psig), should be isolated from the work area by two closed valves in series, and a telltale (visible) vent or drain valve between the isolation valves should be opened. **If** two valve isolation cannot be provided or a vent or drain is **not** available between the first isolation valve and the location of the work to be performed, **then** take the following actions:

- Issuing Authority documents single valve isolation/lack of vent/drain in block 16 – Cautionary Notes.
- Service Supervisor ensures a work plan is developed and documented on CP3-SM-1101-F13, *Work Control Status Log*, if applicable, or other administrative log for work to be performed. Work plan includes any extra precautions to be taken (i.e. personal protective equipment to be worn). Service Supervisor obtains the signature of their manager and the group manager of the IA on CP3-SM-1101-F13 if applicable, or other administrative log.
- Authorized employees performing work under the LOTO protection shall be briefed on the work plan.

NOTE:

It is acceptable to isolate lines or piping **less than or equal to** ¾ inch that contain or potentially contain UF_6 with one isolation valve provided all of the requirements of Section **6.1** can be met. Documented management approval of the single valve isolation is **NOT** required for this specific scenario.

5.1.2 Systems containing hazardous materials should be isolated by two valves in series and the isolated section should be purged. **If** two-valve isolation **CANNOT** be provided or the system **CANNOT** be purged, **then** before performing work, take the following actions:

- Issuing Authority documents single valve isolation/lack of purge in block 16 – Cautionary Notes.
- Service Supervisor ensures a work plan is developed and documented on CP3-SM-1101-F13, *Work Control Status Log*, if applicable, or other administrative log for work to be performed. Work plan includes any extra precautions to be taken (such as, personal protective equipment to be worn). Service Supervisor obtains the signature of their manager and the manager of the IA on CP3-SM-1101-F13 if applicable, or other administrative log unless the signature is not required in the note box above
- Authorized employees performing work under the LOTO protection shall be briefed on the work plan.

5.1.3 Where energy isolation devices are **NOT** lockable and the tagout method is used, it is required to implement an additional protective measure(s). Examples of additional protective measures include but are **NOT** limited to the following:

- Removal of an isolating circuit element.
- Blocking of a controlling switch.
- Opening of an extra disconnecting device.
- Installation of dummy fuse blocks.
- Removal of a valve handle to reduce the likelihood of inadvertent release of hazardous energy.

5.1.4 When the tagout only method is used, the Danger Do Not Operate (DDNO) tag shall be installed in the same position available for the lockout device and the tag attachment shall be the equivalent to a nylon tie with a minimum 50-pound tensile strength.

5.1.5 LOTO shall **NOT** be used to secure systems or equipment for normal operations, system lineup, or placing equipment in an out-of-service condition for purposes other than activities that could expose an authorized employee to hazardous energy.

5.1.6 The Issuing Authority (IA), the Service Supervisor (SS), and the Authorized Employee (AE) shall determine if a LOTO is required, and if so what type is required.

5.1.7 **If** a permit that was issued prior to D&R Contractor activities (before October 21, 2014), is found, **then** the permit shall be removed and a new permit issued, if still needed, according to this procedure.

5.1.8 AEs are **NOT** permitted to apply or remove another employee's lock with the exception of

criteria listed in Section **6.14**.

5.1.9 A CP-22144, *Master Control Tag*, shall **NOT** be used unless there is at least one non-lockable EID listed on the LOTO permit.

5.1.10 In the event that a copy of the LOTO permit is altered (such as, Service Supervisor adds the satellite lockbox number and building number to the copy), the altered copy becomes a record and must be handled according to Section **7.0**.

5.1.11 Owners of LOTO locks control and maintain them in a designated location and issue them to authorized employees as needed to perform LOTO activities.

5.1.12 Non-qualified persons (such as, Maintenance Mechanics) who are exposed to electrical hazards shall verify the equipment has been placed in an electrically safe working condition **and** apply their personal lock prior to beginning work covered by this procedure. This may be accomplished by requesting verification from qualified persons (such as, Electricians) or visually verifying grounds have been installed.

5.1.13 **If** performing service or maintenance work that has the potential to expose a worker to hazardous electrical energy, **then** the work must be performed by a qualified person or established as electrically safe by a qualified person.

5.1.14 Facility Managers/Issuing Authorities maintain a log or equivalent record/spreadsheet of both active and closed LOTO permits that contains the permit number and other relevant information**.**

5.1.15 AEs are responsible for maintaining possession of their key for their personal locks

5.1.16 Tagout devices shall be suitable for the environment (i.e. heat, cold, outdoors, etc.) and duration of their use.

5.1.17 The use of a DDNO tag only, without a lockout, is only allowed where the equipment design/EID prevents the installation of a lock on the EID.

5.2 Resources and Training

- LOTO Locks
- CP-22142, *Danger Do Not Operate-Personnel Protection Tag(s)*
- CP-22143, *LOTO Independent Verification Administrative Tag*
- CP-22144, *Master Control Tag*
- CP-23306, *Danger Do Not Operate-Personal Protection LOTO Non-Permit Tag*
- Isolating Devices

5.2.1 Training and Required Reading

A. Individuals who have LOTO performance responsibilities defined by this procedure must complete all required training. This training must be in accordance with CP2-TR-0100, *Training Program*, and completed before any LOTO activities are performed by the individual. At a minimum, the following personnel are to complete the prescribed training

- Authorized Employee or Independent Verifier
- Facility Managers or Issuing Authority/Permit Preparer
- LOTO Subject Matter Expert (currently in Safety and Health Group)
- Qualified Persons
- Plant Shift Superintendent (PSS)
- Service Group or Service Supervisor
- Support Groups

B. Individual and organizational performer responsibilities (of a general job description nature) **NOT** specifically listed above have **NO** training requirements specified by this procedure.

C. LOTO SME will communicate changes to this procedure using applicable processes (i.e. required reading or crew briefing, computer based training, approved equivalent) and ensure that significant changes are added to and covered by the existing classroom module.

6.0 INSTRUCTIONS

6.1 Lockout/Tagout - Non Permitted (Single Source)

<u>Service Supervisor</u>

6.1.1 Review job description **and** assist in determining whether work can be performed under non-permitted (single source).

NOTE:
If multiple service groups are required to complete tasks, **then** all service groups must concur with the protection provided in order to work under single source.

6.1.2 **If** the work to be performed has the potential to expose a worker to hazardous energy, **then** allow work to be performed under a non-permitted (single source) LOTO, provided that the SS(s), AE(s), and the equipment owner [EO(s)] agree that the following conditions are met:

- Machine or equipment has **NO** potential for stored or residual energy, or re-accumulation of stored energy after shutdown, which would endanger employees.
- Machine or equipment has a single energy source, which can be readily identified, isolated, and is capable of accepting a lock on the Energy Isolating Device (EID).

- Isolation of the energy source with a single source LOTO device completely de-energizes and deactivates the machine or equipment.
- LOTO device will be installed and under exclusive control of the AEs performing the servicing or maintenance (for example, each AE must apply his or her lock and tag) during the servicing and maintenance.
- Systems (liquid and/or gas) are less than 200°F and/or less than 500 psig.
- Either the system does **NOT** contain a hazardous material **or** the system contains or potentially contains UF_6 in lines or piping **less than or equal to** ¾ inch.
- No known history of prior accidents involving unexpected activation or re-energization of subject equipment or related system during servicing or maintenance.
- Isolation or work activity does **NOT** create hazards for other affected employees (that cannot be controlled using approved processes or plans).

6.1.3 **N**otify affected employees prior to application of the EID.

<u>Authorized Employee</u>

6.1.4 **If** ALL of the conditions of Step **6.1.2** are met, **then** a LOTO permit is **NOT** required. Perform Steps **6.1.3 and 6.1.6** through **6.1.17.**

6.1.5 **If** any of the conditions in Step **6.1.2** are **NOT** met, **then** a LOTO permit is required. Exit this step **and** proceed to Section **6.2**.

6.1.6 Prepare system or equipment to isolate and control hazardous energy in preparation for servicing or maintenance. Isolate the equipment to a safe energy state.

6.1.7 Document name, badge number, date, and device to be isolated on a CP-23306, *Danger Do Not Operate-Personal Protection LOTO Non-Permit Tag*.

6.1.8 Perform **and** document a system isolation verification (SIV) of the equipment to ensure a safe working condition. The SIV can be documented in applicable work control or other approved documents.

6.1.9 **If** electrical energy is being isolated due to potential electrical exposure, **then** the SIV is an absence of hazardous voltage test performed and documented per Section **6.5**

6.1.10 Place a personal lock and CP-23306 tag to secure the EID.

6.1.11 **For** direct exposure to electrical hazards by qualified persons, when the job location has been left unattended or when circuit conditions have changed, **then** an AE that is also a Qualified Person(s) shall re-verify an absence of hazardous voltage test (such as, test before touch) according to Section **6.5**.

6.1.12 Commence work on the isolated equipment.

6.1.13 Ensure system is in a safe condition prior to removing personal locks.

6.1.14 **When** task is completed, each AE removes his or her personal lock and CP-23306 tag.

Service Supervisor

6.1.15 **If** the work is **NOT** complete at the end of a shift, **then** perform the following:

A. Ensure that AE(s) remove their personal lock and CP-23306 tag.

B. Apply a departmental lock to the single source EID.

C. Notify the EO of equipment status.

Authorized Employee(s)

6.1.16 Resume work by returning to Step **6.1.6 and** request SS to remove their departmental lock previously applied.

6.1.17 Upon task completion, notify EO(s) so they can return the equipment to service, if desired.

6.2 LOTO - Permit Required

NOTE:

Step **6.2.1** may be accomplished by, but is **NOT** limited to, using any of the following methods for the determination of isolation points:

- Controlled Drawings
- Controlled System Schematics
- Other Controlled Documents
- Physical System Walkdowns
- Contact Engineering for assistance

Issuing Authority (Permit Preparer)

6.2.1 Determine EID's necessary, the position of EIDs, and SIV method while separate in time and space from the independent verifier.

Authorized Employee (Independent Verifier)

6.2.2 Determine EID's necessary, position of EIDs, and SIV method while separate in time and space from the issuing authority.

Issuing Authority (Permit Preparer)

6.2.3 Once agreement has been reached regarding the EIDs required for the LOTO permit, prepare the permit per Section **6.3**

6.3 LOTO Work Permit Preparation

Issuing Authority (Permit Preparer)

NOTE:

Steps **6.3.1A** through **6.3.1G** can be performed in any order.

Appendix K is supplemental information that can be used to complete a LOTO permit.

6.3.1 Record the following information on CP3-HS-2010-F02, *Lockout/Tagout Work Permit,(PERMIT)* **and** enter "N/A" in appropriate sections:

A. Record Logged By initials. (Block 1)

B. Record LOTO Number (Block 2) as noted in the applicable building/area log/spreadsheet or equivalent, in Step A.
(Example: 17-333-1; year, building or area, sequential number)

C. Document Location of equipment and/or area where work is to be performed. (Block 3)

D. List specific equipment in Equipment/Process to be Isolated. (Block 4)

E. Document the Hazardous Energy(s) to be controlled. (Block 5)

F. Identify the System Isolation Verification (SIV) Required (Block 6)

G. **If** protection applied is to follow the order listed on the permit, **then** check "Yes" in Tagout Sequence to be Followed section. **If** sequence is **NOT** required to be followed, **then** check "No." (Block 8)

NOTE:

Lockable EIDs only require one control. However, an additional control is required for all non-lockable EIDs to prevent inadvertent energization. The additional control may be an integral part of the primary control or it may be separate from the primary control.

Examples of an integral control include removal of fuses and insertion of dummy fuses to prevent fuses from being re-installed or removal of a valve handle to prevent valve operation. Examples of additional controls that are **NOT** integral to the primary control are isolation of the circuit or system at a different point in the system from the primary control.

If the additional control is an integral part of the primary control, **then** the additional control taken (such as, valve handle removed) does **NOT** have to be tagged. If the additional control is **NOT** an integral part of the primary control (such as, two separate breakers isolated) then both controls must be tagged. The additional control should have a letter added to the tag number suffix to indicate it is related to the primary control (such as, 16-600-10-01 and 16-600-10-01A, etc.)

LOTO permits that include non-lockable devices also require the use of a CP-22144, *Master Control Tag*, to alert personnel that non-lockable devices are being used to control hazardous energy.

H. Record the tag number suffix to be applied on each device in Tag No. section. (Block 9) **If** the device is an additional control for a non-lockable device, **then** add a letter to the primary control tag number suffix.

I. List Energy Isolating Device(s). (Block 10)

J. **If** the device is lockable, **then** record position of component required to provide energy isolation in Device Status section. (Block 11)

K. **If** the device is **NOT** lockable but allows for an additional control to be an integral part of the primary device, **then** identify both controls used in the device status block to prevent inadvertent energization (such as, valve open or handle removed or fuses removed/dummy fuses installed, etc.) (Block 11).

L. **If** the EID is **NOT** lockable and the additional control is **NOT** an integral part of the primary control, **then** energy isolation controls are required. Identify the device status of each control on separate lines of the permit.

M. **If** a lock is to be applied, **then** record "Yes" in Lockable section. **If** the device is **NOT** lockable, **then** record "No" in Lockable section. (Block 12)

N. **If** required, **then** check "Yes" in Additional Energy Isolating Devices Are Listed on Attached Page section of PERMIT. **If** additional pages are **NOT** needed, **then** check "No." (Block 15)

O. Document applicable cautions in Cautionary Notes section of PERMIT. This identifies other hazards **NOT** isolated. (Block 16)

P. Document any off-normal conditions, anomalies, or other information, as needed, in Remarks section of PERMIT. (Block 17).

Q. Ensure performers sign and date Permit Prepared By and Independent Verification sections of PERMIT. (Blocks 7A and 7B).

6.3.2 Prepare CP-22142, DDNO -*Personnel Protection Tag(s)*, , CP‑22143, *LOTO Independent Verification Administrative Tag*, and, if applicable, CP‑22144, *Master Control Tag*, (such as, only used if non-lockable EID(s) listed on permit)

6.3.3 **If** desired, **then** request AE to verify there are **NO** administrative errors on tags or permit (such as, verify tags match permit description and correct numbers

6.3.4 Ensure affected employees are notified whenever LOTO might directly affect their work activity.

6.4 Isolation, Placement, and Verification

NOTE:

When it is **NOT** possible to separate the operation (of an EID) and the verification (of the EID's position) by time, it is acceptable to use concurrent verification to isolate, lock (if lockable) and tag the EID(s) in question if approval is obtained from the IA's director and documented in block 17 – Remarks.

It is acceptable for Authorized Employees (AE) who are performing the first alignment check and/or the independent verifier to be accompanied by another AE provided that the accompanying AE is **NOT** the same person supporting both steps.

Authorized Employee(s)

6.4.1 **When** independent verification is possible, perform the following steps:

First AE

A. Locate the correct EID(s) listed on the permit by comparing the EID component label to the permit.

B. Place the EID(s) in the "device status" listed on the permit.

C. Release the stored energy, where applicable.

D. Ensure the issuing group, tag number, and device identification, are listed on CP‑22143, *LOTO Independent Verification Administrative Tag*.

E. Apply CP-22143, *LOTO Independent Verification Administrative Tag* to the EID(s) listed on the permit.

F. Initial the Aligned/LOTO IV Admin Tagged by column of the permit for EID tagged (**Block 13**).

Second AE

G. After the first AE has completed **Block 13** for the EID(s), with LOTO permit in hand, perform IV of EIDs listed on the permit with **Block 13** initialed per the following steps:

1. Verify the EID listed on the permit is in the correct position (such as, lay hands on a valve and verify it is closed) as stated in the "device status" column and has a CP-22143, *LOTO Independent Verification Administrative Tag,* applied. May remove the existing tag, CP-22143, if necessary, to apply locks, donuts, etc.

2. **If** the EID is determined **NOT** to be in the correct "device status," **then** immediately contact the Issuing Authority for guidance.

NOTE:

If work under the LOTO permit includes electrical hazards, it may be necessary for a Qualified Person to perform an absence of hazardous voltage test **prior to** actual application of *Danger Do Not Operate* (DDNO) tags and tag locks (if lockable) on EIDs depending upon the system configuration. Absence of voltage testing is covered by Section **6.5**.

3. **If** the EID is lockable, **then** apply a tag lock (including any necessary locking devices) and CP-22142, *LOTO DDNO tag*, to the EID **and** re-apply CP-22143 tag if it was removed in Step **6.4.1.G.1**

4. **If** the EID is **NOT** lockable, **then** apply a CP-22142, *LOTO DDNO* tag to the non-lockable device(s), then apply a tag lock (if lockable) and/or CP-22142, *LOTO DDNO* tag to the device being credited for being the additional protective measure on the permit (if applicable according to Step **6.3.1.K or 6.3.1.L**). Re-apply the CP-22143 tag if removed during Step **6.4.1.G.1.**

5. Initial the **Status Verified/Locked and/or Tagged by** section of the permit for each EID (**Block 14**).

Issuing Authority

6.4.2 **If** IV is **NOT** possible and concurrent verification must be used, **then** obtain approval from the IA's director **and** document in REMARKS Block 17.

AE(s)

6.4.3 **If** using concurrent verification is deemed necessary, **then** two AEs together perform the following steps:

First AE

A. Ensure EID specified on the PERMIT is positioned (aligned) according to the PERMIT stated Device Status and is aligned in the order required by the PERMIT Tagout Sequence.

Second AE

B. Concurrently verify EACH EID specified on the PERMIT is aligned according to the PERMIT stated Device Status and is aligned in the order required by the PERMIT Tagout Sequence.

First AE

C. Apply LOTO Independent Verification Administrative and DDNO Tag and tag lock (and any necessary locking devices for lockable EID) for EACH EID specified on the PERMIT.

Second AE

D. Concurrently verify LOTO Independent Verification Administration and DDNO Tag and tag lock (for lockable EID) for EACH EID specified on the PERMIT has been applied.

First AE

E. Initial the Aligned/LOTO IV Admin Tagged section of the PERMIT for EACH EID (Block 13).

Second AE

F. Initial the Status Verified/Locked and/or Tagged By section of the PERMIT for EACH EID (Block 14).

6.4.4 **If NOT** previously performed, **then** perform SIV as directed in block 6 of the LOTO permit.

6.4.5 Document completion of the SIV (Block 18). See Appendix I as an example of documentation wording. Enter "N/A" if M&TE is **NOT** required.

6.4.6 In the unlikely event that a SIV is physically impossible to complete or perform due to equipment or process configuration or other credible reasons, enter "N/A" in block 18 as the SIV description, then document any necessary cautionary notes in block 16 and any necessary remarks for clarification in block 17.

Issuing Authority

6.4.7 Record the Permit Box I.D. information on the PERMIT. (Block 19)

6.4.8 Add tag lock key(s) (as applicable) and CP-22144 Tag, (if non-lockable EIDs listed on permit), in the permit lockbox.

6.4.9 Place departmental lock on the permit lockbox.

6.4.10 Place copy of LOTO PERMIT at lockbox.

6.5 Absence of Hazardous Voltage Test

NOTES:

This section of the procedure only applies if an absence of hazardous voltage test for electrical hazards is required by other steps or sections in the procedure.

It is imperative that all qualified persons performing an absence of voltage test be fully knowledgeable of the entire scope of electrical work that will be performed under the LOTO protection. The qualified person can understand the electrical work scope through discussions with the IA, SS, or review of applicable work control documents.

During the performance of absence of hazardous voltage testing before the LOTO permit has been issued, qualified persons may:

- Place their personal lock on the permit lock box, if established **OR**
- Request control of applicable tag lock keys (such as, AE is present with applicable tag lock key(s) when testing is performed by qualified person)

for any and all electrical EIDs for the protection of the qualified persons during the actual testing.

Qualified Person

6.5.1 **When** an absence of hazardous voltage test is required, perform according to CP4-SM-0010, *Verifying De-Energized Electrical Equipment*, CP3-SM-0017, *Measuring and Test Equipment*, and the following steps:

A. Perform the test with an approved M&TE meter.

B. Document the SIV performed (see Appendix I), signature, badge number, date **and** list the M&TE equipment number and due date in (Block 18) of the LOTO permit, **or**

C. For non-permit (single source), list the M&TE equipment number and calibration due date for the M&TE used in a work package or other applicable work control document, etc.

6.6 Permit Issued and Accepted

NOTE:

If the LOTO permit is being issued to the IA's group, **then** the IA's group will apply a second departmental lock (or permit lock if a satellite lockbox will be used) to the permit lockbox. Authorized employees working under the permit protection will still be required to apply personal locks per Step **6.7.1**.

Issuing Authority

6.6.1 Meet with Service Supervisor in person, discuss, **and** agree that the protection provided is adequate for the job scope and craft performing the work.

Authorized Employee and Service Supervisor

6.6.2 Review PERMIT for accuracy and adequacy of the LOTO protection.

6.6.3 Perform a walkdown, either together or independent of each other, to confirm the LOTO protection provided, will allow the work to be done safely, by ensuring that ALL energy isolation devices listed on the permit meet the following conditions:

A. **When** possible, ensure the device is properly positioned (visual check only).

B. Appropriately locked (if lockable) and tagged.

Issuing Authority

6.6.4 **When** the PERMIT is ready to be issued, perform the following:

A. Record name of work group to whom the PERMIT is being issued. (Block 20)

B. Document scope of the work to be performed. (Block 21)

C. Record signature, badge, date, and time of issuance. (Block 22)

Service Supervisor

6.6.5 Document completion of Step **6.6.3** and acceptance of the permit by recording signature, badge, date, and time of acceptance on the PERMIT. (Block 23)

6.6.6 Make a copy of the original PERMIT.

6.6.7 Stamp or write “COPY” or “WORKING COPY” on the PERMIT copy.

6.6.8 **If** using a permit lockbox only, **then** apply department lock to permit lockbox.

NOTE:

In the event that the permit copy is altered (such as, satellite box number and building added to the permit copy), the altered permit copy becomes a record.

6.6.9 **If** using a satellite lockbox, **then** perform the following:

A. Install permit lock on permit lockbox

B. Place the permit lock key in the appropriate satellite lockbox, ensure the key number is visible inside the satellite lockbox, and hang a copy of the permit near the satellite lockbox.

C. Apply department lock to the satellite lockbox.

6.7 Performing Work under Lockout/Tagout Permit

Authorized Employee

6.7.1 Prior to starting work, apply personal lock to the permit lockbox or satellite lockbox.

NOTE:

If they are **NOT** present for the initial absence of hazardous voltage test, **then** qualified persons may choose to perform an absence of hazardous voltage test for themselves.

6.7.2 **For** direct exposure to electrical hazards by qualified persons, when the job location has been left unattended or when circuit conditions have changed, then an AE that is also a qualified person (s) shall re-verify absence of hazardous voltage test (such as, test before touch) according to Section **6.5.**

6.7.3 **If** grounds are required, **then** document location of ground on CP3-HS-2010-F01, *Electrical Field Ground Log.*

6.7.4 Perform work, as required by work package or other work control document or process.

6.7.5 **If** applicable, and **when** work is complete, **then** remove grounds **and** document in the Removed section of the CP3-HS-2010-F01.

6.7.6 **When** work is complete or at the end of the shift, remove personal lock.

Support Groups

NOTE:
Support groups overlocking the permit with their personal lock are **NOT** required to sign onto or walk down the PERMIT.

6.7.7 Before applying personal lock, notify the IA or SS.

6.7.8 Overlock the appropriate lockbox with personal lock **and** ensure it is removed once the work is complete or at the end of the shift.

6.8 Work Complete

Authorized Employee

6.8.1 Ensure personal locks have been removed.

Service Supervisor

6.8.2 Inspect the work area to ensure it is safe to release the PERMIT.

6.8.3 Verify ALL personal locks have been removed from permit or satellite lockbox.

6.8.4 Remove department lock.

6.8.5 **If** a satellite box is used, **then** perform the following:

A. Retrieve permit lock key from the satellite lockbox.

B. Remove copy of permit from satellite lockbox area **and** treat as a record per Section **7.0 if** copy was altered (such as, place in applicable work control document).

C. Remove permit lock from the permit lockbox.

6.8.6 **If NO** grounds are transferred or applied, **then** enter “No” in Block 24 of the PERMIT.

6.8.7 **If NO** electrical work was performed under permit, **then** select “N/A” in Block 24 of the PERMIT.

6.8.8 **If** grounds were transferred or applied, **then** enter "Yes" in Block 24 of the PERMIT and provide original CP3-HS-2010-F01 to the IA.

6.8.9 Complete the Released by section of the original PERMIT. (Block 25)

6.9 Release of Permit

NOTE:
Once block 29 has been signed indicating the permit has been closed out, the permit **CANNOT** be re-issued.

Issuing Authority

6.9.1 Verify ALL the SSs have signed off on PERMIT.

6.9.2 Perform the following:

A. Inspect the work area.

B. Ensure ALL grounds have been removed, as applicable.

C. Determine whether it is safe to remove the PERMIT protection.

6.9.3 Remove department lock from the permit lockbox.

6.9.4 Retrieve tag lock key(s) **and** remove CP-22144, as applicable.

6.9.5 Initial Tag Removal Authorization section of the PERMIT (Block 26) for each EID tag to be removed.

Authorized Employee(s)

6.9.6 Match the PERMIT with tag lock key(s), **and/or** match CP-22144 (if applied).

6.9.7 Ensure Tag Removal Authorization section (Block 26) is complete for EACH EID.

6.9.8 Perform the following with two AEs:

First AE

A. Remove all LOTO tags and tag locks **and** initial the Lock/Tags Removed by section of the PERMIT (Block 27) for EACH isolation point.

Second AE

B. Verify all LOTO tags and tag locks have been removed **and** initial the Tag Removal Verified by section of PERMIT for EACH isolation point. (Block 28).

Issuing Authority

NOTE:

LOTO permits issued prior to (6/24/2016) do **NOT** have a Block 29 on the permit to sign. Documentation of this step for those permits can be accomplished using Block 17.

LOTO permits issued by the previous contractor prior to revision 2 of this procedure may have a Block 29 titled "Return to Service of Permit" for the IA to sign which documents the permit is ready to close out.

6.9.9 **When** the LOTO permit is ready to be closed, ensure all tags are discarded, sign the "Return to Service" (if applicable) and PERMIT Closure section of the PERMIT. (Block 29), and note the permit closure in the applicable permit log.

6.10 LOTO Work Permit Error or Inadequate Protection Prior to LOTO Being Issued

Issuing Authority

6.10.1 Review the PERMIT for accuracy and adequacy of protection.

6.10.2 Correct minor errors noted on PERMIT by performing the following:

A. Draw a single line through the error.

B. Write in the correct information.

C. Initial **and** date the correction (for example, typographical error, misplacement of data, and/or other administrative errors).

6.10.3 **If** inadequate protection is detected after the verification steps have been completed, **then** perform the following:

A. Re-evaluate EID(s) and controls.

B. Void PERMIT.

6.11 LOTO Work Permit Error or Inadequate Protection or Lost Permit for Issued LOTO

Authorized Employee

6.11.1 Cease work activities and ensure that the equipment or system is in a safe condition.

6.11.2 Notify PSS, Safety and Health, and IA.

Issuing Authority

6.11.3 Develop a Recovery Plan.

6.12 Lost Tags on Existing Permit

Authorized Employee

6.12.1 Cease work **and** notify IA.

Issuing Authority

6.12.2 Evaluate the significance of the lost tag(s) **and** report to the appropriate management personnel.

6.12.3 Perform the following:

A. Document the occurrence in Remarks section (Block 17) of the PERMIT.

B. Fill in the unused row in blocks 26, 27, and 28 with a "Z" line, **and** enter your initials, and date

6.12.4 Sign **and** date in the Remarks section (Block 17) of the PERMIT.

6.12.5 Direct the AE to reapply tags according to Section **6.4.**

6.13 Temporary Clearance of LOTO

Issuing Authority

6.13.1 Evaluate the hazards posed and affected service groups who are signed onto the permit.

Service Supervisor

6.13.2 Verify the component or system is ready and safe to be released.

6.13.3 Complete applicable steps in Section **6.9** to release the PERMIT.

Issuing Authority

6.13.4 Review Block 25 **and** ensure ALL permit holders sign off the PERMIT. (Block 25)

6.13.5 Authorize the removal of necessary isolation points to accomplish the operation of equipment. (Block 26)

Authorized Employees

6.13.6 Perform proper lock/tag removal **and** document in Blocks 27 and 28.

6.13.7 Perform any necessary test(s).

Issuing Authority

6.13.8 **If** permit is still needed, **then** fill in the first unused/blank row with a "Z" line **and** enter your initials, **and** date

6.13.9 **If** permit is still needed, **then** reapply removed tags in the Protection Applied section of PERMIT per applicable Steps of **6.3.1** and Section **6.4**. Original tags may be reused.

6.13.10 **If** permit is **NO** longer needed, **then** return to Section **6.9**.

6.14 LOTO Device Removal under the Direction of the PSS

PSS

6.14.1 Remove a personal lock applied by an AE who is **NOT** on-site by performing the following:

A. Verify the AE whose lock(s) is to be removed is **NOT** on-site.

B. Make all reasonable efforts to contact the AE.

C. Ensure the system is in a safe condition.

D. Remove or monitor removal of lock(s).

Issuing Authority

6.14.2 Record the actions taken in Remarks section of the PERMIT. (Block 17)

6.14.3 Sign **and** date the entry.

6.14.4 Ensure the AE's Supervisor has been informed that the AE's lock has been removed.

Supervisor

6.14.5 Ensure the AE is informed of the removal of his/her personal lock upon returning to work and prior to performing any work under LOTO protection.

PSS

6.14.6 Remove a lock for which ownership **CANNOT** be determined by performing the following:

A. Ensure the system is in a safe condition.

B. Remove or monitor removal of lock(s).

Issuing Authority

6.14.7 Record actions taken in the Remarks section of PERMIT. (Block 17)

6.14.8 Sign **and** date the entry.

6.15 Lost Key Securing a System

Authorized Employee (for example, employee who lost the key)

6.15.1 Notify the PSS.

PSS

6.15.2 Verify the lock(s) belongs to the AE.

6.15.3 Remove **or** monitor removal of lock(s).

6.15.4 Record occurrence in the PSS log.

6.15.5 Return the lock(s) to the AE.

6.16 Periodic Inspection or Assessment

Safety and Health Group

6.16.1 Ensure a periodic inspection or assessment of this procedure is performed and documented, at least annually, by the applicable group(s).

6.16.2 Ensure the periodic inspection or assessment contains, at a minimum, all of the following:

- Inspection or assessment is performed by an authorized employee who is **NOT** one utilizing the energy control procedure.
- Include all of the following information:
  - Date of the inspection or assessment.
  - Name of the person performing the inspection or assessment.
  - Name(s) of the employee(s) included in the inspection or assessment.
  - The equipment which was being controlled.
- **If** any deviations or inadequacies are identified, **then** ensure they have been documented using applicable plant procedures for assessments or surveillances and corrective actions.

6.17 Periodic Review

NOTE:

EIDs that are located in areas with increased hazards (such as, high contamination area, permit required confined space, respiratory protection required, etc.) do **NOT** have to be verified as part of the annual review.

Safety and Health assists by notifying the Facility Managers of the need to perform the annual review.

Facility Manager

6.17.1 Ensure an annual walk down of active LOTO permits is conducted and documented on CP3-HS-2010-F03 (Appendix J).

7.0 RECORDS

7.1 Records Generated

The following records may be generated by this procedure:

- CP3-HS-2010-F01, *Electrical Field Ground Log*
- CP3-HS-2010-F02, *Lockout/Tagout Work Permit(including altered permit copies)*
- CP3-HS-2010-F03, *Active LOTO Permit Periodic Review*
- Periodic inspection or assessment documentation for CP3-HS-2010.

Forms are to be completed in accordance with CP3-OP-0024, *Forms Control*.

7.2 Records Disposition

The records are to be maintained according to CP3-RD-0010, *Records Management Process*.

Appendix A – Acronyms/Definitions

ACRONYMS

AE – Authorized Employee

CFR – Code of Federal Regulations

DDNO – Danger Do Not Operate

D&R – Deactivation and Remediation

DOE – United States Department of Energy

EID – Energy Isolation Device

EO – Equipment Owner

HSS&Q – Health, Safety, Security and Quality

IA – Issuing Authority

IV – Independent Verification

LOTO – Lockout/Tagout

M&TE – Measuring and Test Equipment

NFPA – National Fire Protection Association

OSHA – Occupational Safety and Health Administration

PSS – Plant Shift Superintendent

SIV – System Isolation Verification

SS – Service Supervisor

SST – Swift and Staley Team

STA – Safety Task Assignment

Appendix A – Acronyms/Definitions (Continued)

DEFINITIONS

Absence Of Hazardous Voltage – A term used to declare a circuit is free from hazardous energy (less than 50 volts).

Affected Employee – An affected employee is one who works in or around the area in which service or maintenance is being performed. An affected employee is not permitted to work on the equipment that is under LOTO.

Air Gap - The act of physical removal of a section of piping, conduit, etc. that renders the original configuration unusable (e.g. removal of electrical raceways, piping sections). Usually the removal of 12" to 24" of piping, conduit, etc. is a sufficient length removed to prevent reconnection without extreme effort.

Authorized Employee (AE) – An employee trained to the requirements of this procedure and is required to perform either of the following:

- If system knowledgeable, determine EID's, position of EIDs, and SIV method while separate in time and space from the issuing authority. (IA, Permit Preparer, Independent Verifier)
- Apply tags and/or locks on machines or equipment to isolate and control hazardous energy in preparation for servicing or maintenance.
- Work under the protection of a LOTO Work Permit (CP3-HS-2010-F02). (Service Group)

Capable Of Being Locked Out – Isolating device that has a hasp or other means of attaching a lock; has a built-in locking mechanism; or is capable of being locked out without dismantling, rebuilding, or replacing the isolating device.

Concurrent Verification – A series of actions by two individuals working together at the same time and place before and during a specific action, to reduce the potential of an error by the performer and to separately confirm the condition of a component before and during an action.

Contract Technical Representative – PGDP D&R Contractor personnel assigned responsibility as a technical liaison between PGPD D&R Contractor and supplier/contractor personnel. This person is responsible for safety, security, site administration, and coordination of assigned supplier/contractor personnel; and, if all required LOTO training has been completed, may also serve as the service supervisor for subcontract personnel.

Electrical Hazard – A dangerous condition such that contact or equipment failure can result in electrical shock, arc flash burn, thermal burn, or blast.

Employer — For the purpose of this procedure, an employer is Four Rivers Nuclear Partnership for all employees working under the PGPD D&R Contractor prime contract. An outside vendor or supplier not permanently assigned to PGPD D&R Contractor for direct supervision is considered a different employer.

Energy Isolation Device (EID) – A mechanical device to physically prevent the transmission or release of energy (for example, disconnect switch, valve, circuit breaker, etc.). This does not include pushbuttons or other control devices, check valves, rupture discs, pneumatically or hydraulically operated valves (which require air to open and as well as air to close). Pneumatic or hydraulic valves with mechanical return may be allowed if pneumatic or hydraulic supply lines are disconnected and controlled (locked and/or tagged).

Solenoid valves may be allowed with if electric, pneumatic, or hydraulic supplies are disconnected and controlled (locked and/or tagged). Motor operated valves may be used if valve position is verified in the correct position and power supply is isolated and controlled (locked and/or tagged).

Appendix A – Acronyms/Definitions (Continued)

Hazardous Energy – Includes electrical, mechanical, hydraulic, pneumatic, chemical, and thermal. Energy can also mean movement or the possibility of movement. There are two types of energy:

- Kinetic energy is the energy of motion.
- Potential energy is the same as stored energy.

Hazardous Material – Specifically for the purpose of this procedure per DOE-STD-1030-96, this is any solid, liquid, or gaseous material that is toxic, explosive, flammable, corrosive, or otherwise physically or biologically threatening to health. Oil is excluded from this definition. Examples on-site include but are not limited to chlorine, fluorine, chlorine trifluoride, various refrigerants, and sulfuric acid.

Independent Verification – Specifically for the purpose of this procedure, the act of identifying boundary isolation points or checking the position or condition of an item/system separately from activities related to establishing the position or condition. The identification of boundary isolation points and/or the isolation of equipment is performed by two individuals separate from each other in time and space.

Issuing Authority (IA) – Employee who is authorized to prepare and issue the LOTO permit. This employee has knowledge of the equipment or machine that is being serviced, and understands the hazards of the energy to be controlled. The IA who prepares the permit (permit preparer) may be different than the IA who actually issues the permit.

LOTO Lock – Unique locks, (RED in color), that shall be readily identifiable as lockout devices and shall be used for no other purpose than LOTO. Four classes or uses of locks are associated with the LOTO Program:

- Tag Lock – Used to lock Energy Isolation Devices. Key is placed in a permit lockbox, and presence of a Department Lock on a lockbox indicates protection has been verified by the group owning the Department Lock.
- Permit Lock – Used by Service Supervisor to lock onto a permit lockbox and is unique (no series locks). Key is placed in a satellite lockbox.
- Department Lock – Used by IA and Service Supervisor to overlock lockboxes or to control single source equipment when applicable. These locks are unique to each group.
- Personal Lock – Used by AEs to overlock lockboxes and Energy Isolation Device (LOTO non-permitted). Lock(s) are identified by the AE's name and badge number or a completed Individual Lock Tag. AEs are responsible for maintaining possession of their key for their personal locks.

Lockbox — Two types of lockboxes used as part of the LOTO Program:

- Permit Lockbox – Under control of IA. Keys to tag-locks and Master Control Tag are visibly displayed in permit lockbox.
- Satellite Lockbox – Lockbox that is located remotely for convenience of employees. Key to permit lock is placed in a satellite lockbox.

Lockout – The placement of a lockout device on an EID in accordance with this procedure, ensuring that the EIDs for all sources of hazardous energy and the equipment being controlled cannot be operated (prohibited) until the lockout device is forcibly removed.

Normal Production Operations – The utilization of a machine or equipment to perform its intended production function.

Appendix A – Acronyms/Definitions (Continued)

Qualified Person(s) – One who has the demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training to identify the hazards and reduce the associated risk. Typically, this is an electrician or electrically trained person who is also an AE.

Service Point – The point of connection between the facilities of the serving utility and the premises wiring. The point usually is established by the serving electrical utility. Utility Systems at the D&R Contractor include 161-kV systems, 13.8-kV systems, and Security and Street Lighting systems that operate at 2,400-kV and 480-V.

For the purpose of this procedure the service point is defined as follows:

- For electrical service to a structure or facility that operates at a nominal voltage of less than 13,800 volts, and is provided from an overhead drop, the service point shall be the splice point near the weather cap of the service raceway containing the service conductors.
- For electrical service to a structure or facility that operates at a nominal voltage of less than 13,800 volts and is provided from an underground lateral supplied from an elevated transformer, the service point shall be the connection of the lateral conductors at the first equipment mounted on or near the served structure or facility.
- For electrical service to a structure or facility that operates at a nominal voltage of less than 13,800 volts and is provided from a pad-mounted transformer, the service point shall be the connection of the secondary conductors to the secondary terminals of the transformer or the line side terminals of the transformer secondary breaker.
- Security and street lighting system.
- Circuitry that monitors and/or controls supply side electrical distribution (e.g. SCADA, control panels, etc.)
- Direct current systems used to operated and control electrical utility switching devices.

Since FRNP acts as the serving utility, the Power Operations Manager will establish the point for the site, and may establish additional temporary service points with approval of the Electrical AHJ for the site.

Service Group – Group performing the actual servicing or maintenance work under the protection of the LOTO permit or non-permit (single source).

Service Supervisor – Employee who is authorized to accept and release the LOTO permit and manages the Service Group.

Servicing and/or Maintenance – Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. Per OSHA, these activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Short Term Service Contractor – A contractor performing short term service type work (e.g., janitorial, equipment repairs, elevator or boiler inspections, etc.) under the supervision of a contract technical representative who is LOTO qualified. Safety and Health is consulted to determine if this contractor qualifies as a short-term service contractor and is acceptable to complete the abbreviated LOTO training.

Support Group – Groups providing assistance/support to service groups or Operations using LOTO protection such as RADCON, Engineering, etc.

Appendix A – Acronyms/Definitions (Continued)

System Isolation Verification (SIV) – An action intended to ensure that hazardous energy sources have been effectively isolated, that residual or stored energy has been blocked, and equipment will not start from inadvertent activation of operating controls. Examples of SIV methods are listed below:

- Verifying equipment does not start by pushing a start button or other normal actuating controls.
- Use of test instrumentation to test for temperatures, pressure, flow, voltage, etc.
- All motion has stopped and all coasting parts such as flywheels, pulleys, or saw blades have come to rest.
- Flow has stopped such as by direct observation at a sight glass, vent, or visual observation of insertion of a blind flange.
- Open electrical disconnect switches on systems above the service point.

Tagout – Placement of a DDNO tag on an energy-isolating device. Installing a tagout device on all sources of hazardous energy, such that operation of the disconnecting means is prohibited.

Tags – The following tags are used in implementing the LOTO program:

- Danger-Do-Not-Operate (DDNO) – A tag applied to each Energy Isolating Device(s) listed as boundary protection points on the LOTO permit.
- LOTO Independent Verification Administrative Tag – an administrative tag applied by the first AE on an energy isolation device to indicate that correct EID has been positioned as required.
- Master Control – This tag acts in the same capacity in a tagout as a key does in a lockout. The tag indicates that the LOTO permit has non-lockable devices identified as EIDs. The permit number placed on the Master Control Tag is the same as the number on the LOTO permit. This tag, when required, must accompany the authorized employee and LOTO permit when applying and releasing the tagout. The Master Control Tag is visibly displayed in the permit lockbox while the permit is active.
- Single Source Tag – A tag applied to a sole Energy Isolating Device by an individual performing service group work when a LOTO permit is not necessary.

Test Before Touch – A term used to verify absence of hazardous voltage by utilizing the Live/Dead/Live technique on electrical equipment.

Appendix B – CP-22142, Danger Do Not Operate-Personnel Protection Tag

EXAMPLE

EXAMPLE

Appendix C – CP-22144, Master Control Tag

EXAMPLE

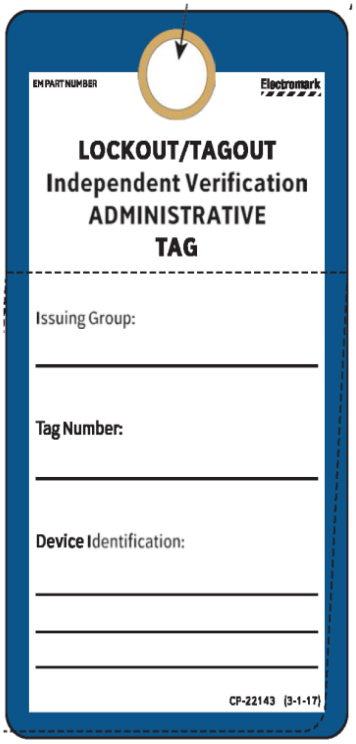
EXAMPLE

Appendix D – CP-23306 - Danger Do Not Operate-Personal Protection LOTO Non-Permit Tag

EXAMPLE

Appendix E – CP-22143 - LOTO Independent Verification Administrative Tag

EXAMPLE



EXAMPLE

Appendix F – SST DELTAs with Procedure CP3-HS-2010

Section(s)	D&R Contractor Language	SST Alternative
2.2	CP3-RD-0010, *Records Management Process*	PGDP-RM-PR-001, *Records Management*
2.2	CP4-SM-0010, *Verifying De-Energized Electrical Equipment*	ISSC-ESH-PR-006, *Electrical Safety*
5.1	Service Supervisor ensures a work plan is developed on CP3-SM-1101-F13, *Work Control Status Log.*	LOTO permit or Work Package.
5.2.1	At a minimum, the following personnel are to complete the prescribed training • Authorized Employees/Independent Verifiers • Facility Managers • Issuing Authority/Permit Preparer • LOTO Subject Matter Expert (currently S&H employee) • Qualified Persons • Plant Shift Superintendent (PSS) • Service Group/Service Supervisor • Support Group	Authorized employees require LOTO training.
5.2.1	Individuals who have LOTO performance responsibilities as defined by this procedure, must complete all required training. This training must be in accordance with CP2-TR-0100, Training Program, and completed before any LOTO activities are performed by the individual..	Completion of the training module C03202 is required to perform LOTO activities defined in this procedure.
6.5.1	CP3-SM-0017, *Measuring and Test Equipment*	SST Procedure03.01.09, *Control of Measuring and Test Equipment*
6.17.1	Ensure a semi-annual walk down of active LOTO permits is conducted and documented on CP3-HS-2010 F03 (Appendix J).	Ensure annual assessments include an evaluation of locks and tags for active permits.
Appendix A	CP3-SM-0019, *Electrical Safety Guidelines*	ISSC-ESH-PR-006 *Electrical Safety*

Appendix G – CP3-HS-2010-F01 – Electrical Field Ground Log

LOTO - _____

No.	Location	Applied	Transferred From		Removed	Transferred To	
			Per#:			Per#:	
		Initial	Badge No.	Date	Initial	Badge No.	Date
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

Comments: _____

_____

_____

Reviewed By: _____ Badge No.: _____ Date: _____

EXAMPLE

Appendix H – CP3-HS-2010-F02 – Lockout/Tagout Work Permit

(1) Logged By: _____ (2) LOTO No.: _____

(3) Location _____

(4) Equipment/Process to be Isolated _____

SYSTEM CONDITIONS AT THE TIME OF ISSUANCE

(5) Hazardous Energy to be Controlled:

(6) System Isolation Verification(s) Required:

(7a) Permit Prepared By:

_____ _____
Signature / Badge No. *Date*

(7b) Independent Verification:

_____ _____
Signature / Badge No. *Date*

(8) Tagout Sequence to be Followed: YES ☐ NO ☐

PROTECTION APPLIED

(9)	(10)	(11)	(12)	(13)	(14)	(26)	(27)	(28)
Tag No.	Energy Isolating Device	Device Status	Lockable Yes/No	Aligned / LOTO IV Admin Tagged by	Status Verified/ Locked and/or Tagged by	Tag Removal Author-ization	Lock/Tags Removed by	Tag Removal Verified by

(15) Additional Energy Isolating Devices Are Listed On Separate Page: YES ☐ NO ☐

(16) Cautionary Notes:

(17) Remarks: _____

(18) System Isolation Verification(s) Performed

_____ _____/_____/_____ _____/_____
SIV Description Signature, Badge, Date M&TE Equip. # Cal Due Date

_____ _____/_____/_____ _____/_____
SIV Description Signature, Badge, Date M&TE Equip. # Cal Due Date

_____ _____/_____/_____ _____/_____
SIV Description Signature, Badge, Date M&TE Equip. # Cal Due Date

(19) Permit Box #: _____ Building: _____ Tag Lock Key #s: _____

(29) Permit Closed _____ _____
Signature / Badge No. *Date*

EXAMPLE

Review the Identified Source Document for this Form Prior to Attempting Completion
Complete All Forms According to CP3-OP-0024

Appendix H – CP3-HS-2010-F02 – Lockout/Tagout Work Permit (Continued)

Work Scope Block Signature List

(2) LOTO No.: _____

(20) Group Issued to: _____				
(21) Work Scope: _____				
(22) Issued by:	Badge:	Date:	Time:	(24) Grounds Trans/Applied YES ☐ NO ☐ N/A ☐
(23) Accepted by:	Badge:	Date:	Time:	
(25) Released by:	Badge:	Date:	Time:	
(20) Group Issued to: _____				
(21) Work Scope: _____				
(22) Issued by:	Badge:	Date:	Time:	(24) Grounds Trans/Applied YES ☐ NO ☐ N/A ☐
(23) Accepted by:	Badge:	Date:	Time:	
(25) Released by:	Badge:	Date:	Time:	
(20) Group Issued to: _____				
(21) Work Scope: _____				
(22) Issued by:	Badge:	Date:	Time:	(24) Grounds Trans/Applied YES ☐ NO ☐ N/A ☐
(23) Accepted by:	Badge:	Date:	Time:	
(25) Released by:	Badge:	Date:	Time:	
(20) Group Issued to: _____				
(21) Work Scope: _____				
(22) Issued by:	Badge:	Date:	Time:	(24) Grounds Trans/Applied YES ☐ NO ☐ N/A ☐
(23) Accepted by:	Badge:	Date:	Time:	
(25) Released by:	Badge:	Date:	Time:	

EXAMPLE

Appendix H – CP3-HS-2010-F02 – Lockout/Tagout Work Permit (Continued)

(2) LOTO No.: _____

(8) Tagout Sequence to be Followed: YES ☐ NO ☐

PROTECTION APPLIED

Tag No.	Energy Isolating Device	Device Status	Lockable Yes/No	Aligned / LOTO IV Admin Tagged by	Status Verified/ Locked and/or/ Tagged by	Tag Removal Author-ization	Lock/Tags Removed by	Tag Removal Verified by

(15) Additional Energy Isolating Devices Are Listed On Attached Page: YES ☐ NO ☐

EXAMPLE

Appendix H – CP3-HS-2010-F02 – Lockout/Tagout Work Permit (Continued)

Work Scope Block Signature List

(2) LOTO No.: _____

(20) Group Issued to: _____				
(21) Work Scope: _____				
(22) Issued by:	Badge:	Date:	Time:	(24) Grounds Trans/Applied YES ☐ NO ☐ N/A ☐
(23) Accepted by:	Badge:	Date:	Time:	
(25) Released by:	Badge:	Date:	Time:	
(20) Group Issued to: _____				
(21) Work Scope: _____				
(22) Issued by:	Badge:	Date:	Time:	(24) Grounds Trans/Applied YES ☐ NO ☐ N/A ☐
(23) Accepted by:	Badge:	Date:	Time:	
(25) Released by:	Badge:	Date:	Time:	
(20) Group Issued to: _____				
(21) Work Scope: _____				
(22) Issued by:	Badge:	Date:	Time:	(24) Grounds Trans/Applied YES ☐ NO ☐ N/A ☐
(23) Accepted by:	Badge:	Date:	Time:	
(25) Released by:	Badge:	Date:	Time:	
(20) Group Issued to: _____				
(21) Work Scope: _____				
(22) Issued by:	Badge:	Date:	Time:	(24) Grounds Trans/Applied YES ☐ NO ☐ N/A ☐
(23) Accepted by:	Badge:	Date:	Time:	
(25) Released by:	Badge:	Date:	Time:	

EXAMPLE

Appendix I – Examples of System Isolation Verifications

The following is a list of system isolation verifications that are commonly used as part of the LOTO process. This list is not inclusive but should be used as a guide for listing SIVs on LOTO permits.

Describe SIV Performed	**Is M&TE Required for this SIV?**
Verified absence of hazardous voltage	Yes
Used temperature/heat gun to verify temperature less than 120 °F	Yes
Visually verified disconnect(s) open (above service point)	No
Visually verified no steam from vent	No
Visually verified little to no flow from main drain	No
UF6 negative per applicable procedure	No
R-114 negative per applicable procedure	No
Visually verified installation of blocks, jackstands, or safety stops	No
Visually verified pressure at safe level	**Yes** *if using installed plant instrumentation per CP3-SM-0049.*
Tried to start (fan, motor, pump, etc.), would not start	No
Visually verified temporary air gap	No

Appendix J – CP3-HS-2010-F03 – Active LOTO Permit Periodic Review

Active LOTO Permit Periodic Review Calendar Year _____		
Annual Review		
List Active Permit Numbers Reviewed: **List of Facilities Reviewed:**		
Criteria for Open/Active Permits ***(check box for yes or write "no")***		**August**
All necessary tag locks and tags are properly attached to the energy isolation devices listed on the permit.		☐
Energy isolation devices with locks and/or tags are in the device status listed on the permit.		☐
Required locks (departmental, personal, and (if necessary) permit locks) are in place on lockboxes. Locks not in use are stored in a central location separate from active permit boards/lockboxes.		☐
No copies of closed permits still hanging on permit boards. Logbook updated to reflect closed permits.		☐
Active permits in place are only for active/scheduled work. No active permits in place for configuration or equipment control.		☐
Signature	**Badge**	**Date**

EXAMPLE

Applicable Comments:

Original – file according to records management requirements.

Copy – send to Safety and Health LOTO SME.

CP3-HS-2010-F03 FR3

Appendix K - Instructions for Completing CP3-HS-2010-F02 - LOTO Work Permit

Block 1 — Record initials in **Logged By** section.

Block 2 — Record **LOTO Number.** (Example 17-333-1; year, building/area, sequential number).as noted in the applicable building/area log/spreadsheet or equivalent.

Block 3 — **Location:** Location of the equipment and/or area where work is to be performed.

Block 4 — **Equipment/Process to be Isolated:** Specific equipment and/or system/process being placed under permit.

Block 5 — **Hazardous Energy to be Controlled:** Description of the hazardous energy normally found in the equipment/process/system being isolated. For example – electrical, steam, air, hydraulic, fluorine, UF6, etc.

Block 6 — **System Isolation Verification Required:** absence of hazardous voltage test, temperature less than 120 degrees, verify no flow from vent/drain, etc.

Block 7a — **Prepared By:** Once the energy isolation devices and device status have been listed on the permit, the individual who prepared the permit will then sign, date, and record badge number.

Block 7b — **Independent Verification:** Before aligning equipment and applying locks/tags, an independent verification must be performed by a system-knowledgeable, LOTO-trained, second person to ensure energy isolation devices and device status are correct and adequate for employee protection. The independent verifier will then sign, date, and record badge number.

Block 8 — **Tagout Sequence to be Followed:** Check "Yes" for equipment to be operated and protection applied in the order listed on the permit or "No" if the order is not important.

Block 9 — **Tag No.:** Tag number suffix to be applied on this particular device.

Block 10 — **Energy Isolating Device:** Component providing the boundary isolation point. (Use of additional information such as the valve, breaker number, pole number, panel number or other information as needed to positively identify the correct component is acceptable.)

Block 11 — **Device Status:** Position of the component required to provide energy isolation.

Block 12 — **Lockable:** "Yes" if a lock is to be applied to the EID or "No" if the EID is not lockable.

Block 13 — Initial on the LOTO work permit signifying the corresponding EID has been aligned and LOTO IV admin tagged as required.

Block 14 — Independently verify by initialing on the LOTO permit signifying the corresponding EID status has been verified, locked (if lockable), and tagged as required.

Block 15 — **Additional Energy Isolating Devices: When** more isolating devices are required than can be listed on the LOTO Work Permit, using the Additional Energy Isolating Devices page. Checking the YES block and entering the LOTO number and page number on the attached page(s).

Block 16 — **Cautionary Notes:** This identifies other applicable energy hazards which have not been isolated. Additional safety precautions may be necessary before performing work. Other applicable protective devices such barriers and other precautions used as a basis for the extent of protection involved in the permit should be listed in the Cautionary Notes section.

Block 17 — **Remarks:** This section can be used to document work control document numbers, off-normal conditions when required by this procedure or other procedures. This section may also be used as needed to document the management approval signatures as described in this procedure.

Appendix K - Instructions for Completing CP3-HS-2010-F02 - LOTO Work Permit (Continued)

Block 18 — **System Isolation Verification Performed:** Performs the SIV as described in block 6, documents the SIV performed, records signature, badge number, and date following successful

completion of the system isolation verification, and as warranted by the system isolation verification method specification, document the results (e.g., voltage, temperature, flow, pressure readings). **If** M&TE is used for the SIV, **then** list the M&TE equipment number and equipment calibration due date. **If NO** M&TE is used/required for the SIV, **then** write "N/A" for "M&TE Equip. #."

Block 19 — Enter the building location of the permit lockbox, the lockbox number, and the device lock(s) key number(s) in the Permit box ID.

Block 20 — **Group Issue to -** Identify the service group.

Block 21 — **Work Scope -** Identify the scope of work.

Block 22 — Permit **Issued By** – enter signature, badge number, date, and time of issuance.

Block 23 — **Accepted By -** after the required walk down, accepts the permit and documents the walk down by entering signature, badge number, date, and time of acceptance.

Block 24 — Complete the **Grounds Transferred/Applied s**ection of the LOTO Work Permit as follows:

- If **NO** grounds were applied, by checking the "No" box of the original permit. If **NO** grounds are applicable, the "N/A" box is checked. The "No" or "N/A" box can be checked at any time after the permit is accepted.
- If grounds were applied or transferred, by checking the "Yes" of the original permit.
- If grounds were applied, ensuring all grounds are removed by comparing **Applied/Transferred From**, against **Removed/Transferred To** sections in Form CP3-HS-2010-F01, *Electrical Field Ground Log*.

Block 25 — **Released by -** release the original LOTO Work Permit by entering signature, badge number, date, and time.

Block 26 — Identify locks/tags to be removed by initialing the appropriate blocks in the **Tag Removal Authorization** section.

Block 27 — Remove the locks/all tags from the EIDs as indicated in the **Tag Removal Authorization** section and initial each corresponding block in the **Lock/Tags Removed By** section.

Block 28 — Verify removal of the tags (LOTO IV admin and DDNO) and initial each corresponding block in the **Tag Removal Verified By** section.

Block 29 — **Permit Closed -** If the permit is **NOT** to be reissued, then block 29 is signed with badge number and date to close permit, all tags are accounted for and destroyed, the permit copy is removed from the applicable lockbox and destroyed (if unaltered from the original), and the IA's Departmental lock is removed from the applicable lockbox. Permit closure is noted in the applicable logbook. Permits issued by the previous contractor may have a block 29 titled "Return to Service". If so, use the criterial listed above in this paragraph to close out block 29 "Return to Service" blocks.

******* **<u>Block 30</u>** – Permits issued prior to revision FR0 of this procedure will have a block 30 titled "Permit Closure". EO closes block 30 on those permits using the criteria listed in block 29 above.

Appendix L – Hazard Threshold Guidance Table

Any exception to the LOTO required column of this table requires Hazard Review Board approval.

Energy Form	Consider Use of LOTO	LOTO Required
Chemical	Chemicals that do not meet the definition of a hazardous material OR chemicals that meet the definition of a hazardous material and are at or below atmospheric pressure.	Chemicals that 1) meet the definition of a hazardous material and 2) are above atmospheric pressure, and 3) system process contains EIDs and can physically be isolated
Electrical (AC or DC)	Ensure there is no increased exposure to electrical burns or explosions due to electrical arcs.	≥ 50 V AC or DC
Hydraulic (Fluids)	≤150 psig **OR** Any fluid with flash point > 200 ° F	>150 psig **OR** Any fluid with flash point ≤ 200 ° F Water at any pressure which results in a secondary hazard to workers (i.e. spray water on electrical equipment, drowning hazard in excavation, cause worker to fall from elevated height, etc.)
Pneumatic	≤ 2” nominal pipe and ≤ 150 psig **OR** ≤ 4” nominal pipe and ≤ 40 psig **OR** ≤ 6” nominal pipe and ≤ 15 psig	>150 psig (any size) **OR** > 2” nominal pipe AND > 40 psig **OR** > 4” nominal pipe AND > 15 psig **OR** > 6” nominal pipe at any psig
Thermal (Hot)	Liquids or gases < 120 ° F	Liquids or gases ≥ 120 ° F
Thermal (Cold)	Liquids and surfaces ≥32 ° F	Liquids < 32 ° F (ACGIH 2017 TLG and BEI booklet for instantaneous frostbite)