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Companywide	Management Control Procedure	For Additional Info: <a href="http://EDMS">http://EDMS</a>	Effective Date: 07/21/14
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Manual: 9 – Operations

**USE TYPE 3**

Change Number: 342063

\*The current revision can be verified on EDMS.

## 1. PURPOSE

This procedure implements the requirements of PRD-5051, “Lockout and Tagout,” (LO/TO) and provides a consistent method to protect employees from injury using Level I & II *lockout* (see def.) and *tagout* (see def.).

## 2. SCOPE

This procedure provides instruction to OSHA *authorized employees* (see def.) for the planning, placement, and removal of locks and tags used to protect employees from unexpected energization of equipment that could cause injury to personnel.

## 3. RESPONSIBILITIES/PREREQUISITES

### 3.1 Responsibilities

Performer	Responsibilities
Primary Authorized Employee, PAE	Review and approve LO/TOs. Provide oversight for escorted personnel. Resolve problems/concerns regarding the LO/TO process. Authorize the placement and removal of Level I & II LO/TOs.
Authorized Employee, AE	Prepare, Install and remove Level II LO/TOs. Perform LO/TO activities on Level I & II LO/TOs.
Authorized Employee (Limited), AE/L	Perform permitted LO/TO activities on Level I & II LO/TOs.
Qualified Person	Start up, operate, or shut down equipment. Perform zero energy verification(s).
Affected Employee	Works on equipment and systems or may work in an area where LO/TO may be applied, does not work under the protection of LO/TO like an authorized employee.

### 3.2 Prerequisites

- 3.2.1 Personnel assigned to perform LO/TO activities are qualified CWI *Authorized Employee, AE* (see def.), *CWI Authorized Employee (Limited), AE/L* (see def.), or *CWI Primary Authorized Employee, PAE* (see def.).

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3.2.1.1 CWI employees not trained and qualified as an OSHA authorized employee shall not be escorted for purposes of LO/TO. Escort, when required, is only for workers *performing work under LO/TO* (see def.) who hold current OSHA compliant outside training and qualification as an OSHA authorized employee.

3.2.1.2 Escorted personnel may perform work activities (if qualified) under LO/TO upon completion of Form 434.42, “ICP LO/TO Requirements for Escort.”

**NOTE:** *Vendor and sub-contractor personnel may observe, advise or consult on work activities being performed under LO/TO as an Affected Employee (see def) as long as they are not performing work and are not exposed to the hazardous energy isolated by the LO/TO in accordance with Section 3.6 in PRD-5051.*

3.2.2 Personnel assigned to prepare LO/TO shall be knowledgeable in the recognition of applicable hazardous energy sources, the type and magnitude of the energy and the methods and means necessary for energy isolation and control.

## 4. INSTRUCTIONS

### 4.1 Routing Table

<b>LEVEL I LO/TO:</b>	
To Prepare a Level I LO/TO:	GO TO Section 4.2
To Approve a Level I LO/TO:	GO TO Section 4.3
To Install a Level I LO/TO:	GO TO Section 4.4
To Perform Zero Energy Verification for a Level I LO/TO:	GO TO Section 4.5
To Work Under a Level I LO/TO:	GO TO Section 4.6
To Remove a Level I LO/TO:	GO TO Section 4.7
<b>LEVEL II LO/TO:</b>	
To Prepare a Level II LO/TO:	GO TO Section 4.8
To Approve a Level II LO/TO:	GO TO Section 4.9
To Install a Level II LO/TO:	GO TO Section 4.10
To Perform Zero Energy Verification for a Level II LO/TO:	GO TO Section 4.11

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To Accept a Level II LO/TO:	GO TO Section 4.12
To Work Under a Level II LO/TO:	GO TO Section 4.13
To Release a Level II LO/TO:	GO TO Section 4.14
To Authorize Removal of a Level II LO/TO:	GO TO Section 4.15
To Remove a Level II LO/TO:	GO TO Section 4.16
To Close Out a Level II LO/TO:	GO TO Section 4.17
To Perform Tagout When an Isolation Device Cannot be Locked Out Under a Level II LO/TO:	GO TO Section 4.18
To Perform Additional Work Under a Level II LO/TO:	GO TO Section 4.19
To Partially Remove a Level II LO/TO:	GO TO Section 4.20
To Replace a Missing or Damaged Danger Tag:	GO TO Section 4.21
<b>BOTH LEVEL I &amp; II LO/TO:</b>	
To Remove a Personal Lock When the Employee is not Available:	GO TO Section 4.22

## 4.2 Preparing for a Level I Lockout and Tagout

- 4.2.1 Authorized Employee (AE) or Authorized Employee (Limited) (AE/L):  
Review the proposed activity to determine the necessary isolation for the scope of work.
- 4.2.1.1 Identify *hazardous energy types* (see def.) involved that require LO/TO for mitigation.
- 4.2.1.2 LO/TO isolation is developed based on the existing equipment or system. Applicable systems drawings/documents shall be used in preparing the LO/TO to effectively isolate workers from hazardous energy sources.
- 4.2.1.3 Determine the equipment position and isolation boundary necessary to isolate the hazardous energy type(s) involved.
- 4.2.1.4 Verify the isolation meets ALL of the following criteria:
- 4.2.1.4.1 The machine, equipment, or system has no potential for stored or residual energy or reaccumulation of stored energy after shutdown, which could endanger employees.
- 4.2.1.4.2 The machine, equipment, or system has a single energy source that can be readily identified and

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isolated effectively to remove the identified hazardous energy types.

- 4.2.1.4.3 The isolation and locking out of that energy source will completely de-energize and deactivate the machine, equipment, or system.
- 4.2.1.4.4 The machine, equipment, or system is isolated from that energy source and locked out during the servicing or maintenance.
- 4.2.1.4.5 A single lockout device will achieve a locked out condition.
- 4.2.1.4.6 The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance.
- 4.2.1.4.7 The servicing or maintenance does not create hazards for other employees.
- 4.2.1.4.8 The facility has had no accidents involving the unexpected activation or re-energization of the machine, equipment, or system during servicing or maintenance.
- 4.2.1.5 IF the isolation does not meet ALL the criteria in 4.2.1.4, THEN a Level I LO/TO MAY NOT be performed and a Level II LO/TO will be required.
- 4.2.1.6 Determine how and where zero energy verification(s) will be performed (including desired results) and which *qualified person* (see def) will perform them for the type(s) of hazardous energy involved in the work to be performed.

### 4.3 Approving the Level I Lockout and Tagout

- 4.3.1 PAE: Review the proposed activity to determine necessary isolation for the Level I LO/TO.
- 4.3.2 PAE: If all criteria in 4.2.1.4 are met, approve the Level I LO/TO.

### 4.4 Installing a Level I Lockout and Tagout

- 4.4.1 AE or AE/L: Coordinate the plant status with the appropriate Job Supervisor/Foreman (JS/F) or Operations Management to support the isolation installation.

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4.4.2 AE or AE/L: Obtain JS/F or Operations Management’s permission to install the approved LO/TO.

4.4.3 Notify affected employees that the equipment will be shut down for LO/TO.

4.4.4 Have a *qualified person* (see def.) shut down the equipment in accordance with approved procedures or other instructions.

4.4.4.1 Have a qualified person position the *isolation device* (see def.) to de-energize or disconnect the equipment from the energy source.

**NOTE:** *If equipment design is such that installing the LO/TO prevents the performance of the zero energy verification, then the zero energy verification may be performed immediately prior to installing the LO/TO with approval of the PAE.*

4.4.4.2 Lock out and tag out the isolation device by attaching a *personal lock* (see def.) in a manner that holds the isolation device in a safe or OFF position and clearly indicates that operation of the isolation device is prohibited.

#### 4.5 Performing Zero Energy Verification

4.5.1 AE or AE/L: Perform or have a qualified person perform the zero energy verification(s) identified in Step 4.2.1.6.

4.5.1.1 IF hazardous energy is encountered, THEN STOP, contact the JS/F and PAE for further directions.

#### 4.6 Working Under a Level I Lockout and Tagout

4.6.1 AE or AE/L: A Level I LO/TO has been prepared, approved and installed in accordance with Sections 4.2 through 4.5. Confirm your *personal lock* (see def.) is on the isolation device for the work to be performed under Level I LO/TO.

4.6.2 AE or AE/L: Perform or observe a *Safe-to-Work Check* (see def) before starting work for that task.

4.6.3 AE or AE/L: If you must leave, other than for lunch or break, prior to completing the work, then perform one of the following steps:

4.6.3.1 Request installation of a Level II LO/TO according to Section 4.8

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OR

- 4.6.3.2 Turn over the Level I LO/TO to an oncoming shift relief by having the oncoming AE or AE/L install their *personal lock* (see def.) in place of your personal lock and inform PAE.

OR

- 4.6.3.3 Obtain approval from the PAE and permission from the JS/F and applicable Operations Management to leave the equipment locked out and tagged out with your personal lock attached.

#### **4.7 Removing the Level I Lockout and Tagout**

- 4.7.1 AE or AE/L: Ensure or have the appropriate qualified person confirm the following items upon completion of work:
- A. Nonessential items have been removed from the equipment
  - B. Equipment is operationally intact
  - C. Employees are safely positioned
  - D. Controls are in a neutral or OFF position.
- 4.7.2 Receive approval from the PAE to remove the Level I LO/TO.
- 4.7.3 Remove your *personal lock* (see def.).
- 4.7.4 Notify affected employees that the LO/TO has been removed.
- 4.7.5 Notify the PAE, JS/F and appropriate Operations Management that *servicing or maintenance* (see def.) is complete.

#### **4.8 Preparing for a Level II Lockout and Tagout**

- 4.8.1 Authorized Employee (AE): Review the proposed activity to determine necessary isolation for the scope of work.

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**NOTE:** *The LO/TO identification number should be composed of three parts as entered in the respective LO/TO logbook, e.g., CPP-7-xxxx with the xxxx being a sequential number for the LO/TO.*

- 4.8.1.1 Enter the LO/TO number in the header of each page of Form 434.38, “ICP Lockout/Tagout Record Sheet” (Record Sheet).
- 4.8.1.2 List the system(s) affected by the LO/TO on the Record Sheet.
- 4.8.1.3 Note the purpose of the LO/TO on the Record Sheet.
- 4.8.1.4 Identify the *hazardous energy types* (see def.) involved that require mitigation and enter them on the Record Sheet.
- 4.8.1.5 LO/TO isolation is developed based on the existing equipment or system. Applicable systems drawings/documents shall be used in preparing the LO/TO to effectively isolate workers from hazardous energy sources.
- 4.8.1.6 Determine the equipment position and isolation boundary necessary to isolate the hazardous energy types involved.

**NOTE:** *The installation sequence is an alpha/numeric (letters or numbers) entry. The same alpha/numeric designation may be used more than once if multiple isolation devices require the same sequence or may be installed in any logical sequence. The same alpha/numeric designation may be used more than once if the locks and tags may be installed in a generic sequence (e.g., locks 1 to 5, A/1 and lock 6 (lockbox) B/2).*

- 4.8.1.7 Enter a numerical tag number, a specific or generic installation sequence, isolation component identification and installation position into the Record Sheet.

**NOTE:** *The identification of the isolation device in the field should agree with the identification on the Record Sheet and danger tag. If drawings and references do not agree with the field marking, this inconsistency should be brought to the attention of the PAE and engineering.*

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- 4.8.1.7.1 Enter the tag number, LO/TO number, system/component identification, required position/condition and Work/Document Reason in the appropriate fields on ICP Danger Tags (Form 434.11) corresponding to the entries on the Record Sheet.
- 4.8.1.7.2 Ensure the isolation device identification on the Record Sheet and danger tag agrees with the labeling of the isolation devices in the field.
- 4.8.1.7.3 Ensure the terminology for the position or condition specified on the Record Sheet for an isolation device agrees with position indication shown on the actual isolation devices in the field (e.g., open, off, trip, etc.) or clearly indicates the desired position if not field labeled (e.g., shut, racked-out, removed, etc.).
- 4.8.1.8 Determine how and where zero energy verification(s) will be performed (including desired results) for the source(s) of hazardous energy involved in the work to be performed previously identified.
- 4.8.1.9 Enter the zero energy verification information into the Record Sheet in the lettered line corresponding to the hazardous energy identified.
- 4.8.1.10 Plan for safe draining or discharge of stored or residual hazardous energy.
- 4.8.1.10.1 Non-electrical zero energy determinations, relief, blocking or prevention of re-accumulation shall be analyzed, controlled and performed in accordance with the hazards identified in the preparation of the LO/TO.
- 4.8.1.10.2 Workers performing the actions for confirmation, relief, blocking or prevention of re-accumulation of energy shall be briefed for the associated work and appropriate hazard mitigation performed as identified in the preparation of the LO/TO.
- 4.8.1.10.3 IF there are exceptional or unique hazards associated with the actions in 4.8.1.10.2, THEN additional hazards control preparation and zero energy performance direction should

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be prepared in accordance with an appropriate mechanism such as; a Safe Work Permit, actions (and recovery) noted in the status log for the appropriate Work Order, etc.

- 4.8.1.10.4 IF specific recovery actions are required for the methods applied, such as; replacement of gaskets, torque rating of fasteners, etc., THEN it is the responsibility of the appropriate JS/F or Operations Management to notify the PAE of required actions when the LO/TO is authorized for removal (the PAE may wish to ensure that it is noted on the Record Sheet special instructions so the appropriate actions may be scheduled when the LO/TO is authorized for removal.)
- 4.8.1.11 If it is possible for stored energy to re-accumulate to a hazardous level while work is performed, then include a method to prevent re-accumulation.
- NOTE:** *Methods could include opening a valve for draining or venting, breaking a flanged connection, installing a grounding device, or using similar means to prevent reaccumulation.*
- 4.8.1.11.1 Designate lock out and if not possible, tag out for all such methods.
- 4.8.1.11.2 When the methods to prevent accumulation involve actions such as removing components, caps or plugs, the removed items should be controlled such as bagging, tagging and securing them in close proximity to the point of removal. Paths and openings established for prevention of reaccumulation shall be blocked open, locked and/or tagged to indicate necessary position/condition.
- 4.8.1.12 Enter specific details for the zero energy and reaccumulation prevention steps from 4.8.1.11 in the Additional Instructions section.
- 4.8.1.13 Sign, enter your S Number and Date the Prepared By space.
- 4.8.1.14 Present danger tags and the record sheet to the primary authorized employee (PAE) for review and approval.

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#### 4.9 Approving the Level II Lockout and Tagout

**NOTE:** *The person approving the LO/TO should not be the person who prepared the LO/TO.*

4.9.1 PAE: Review the danger tags, Record Sheet, and scope of the activity for adequacy of the isolation, installation sequence, and zero energy verification.

4.9.1.1 Approve the tags by signing in the “authorized by” space on the tags

4.9.1.2 Specify if *concurrent dual verification* (see def) is required by checking the box on the Record Sheet.

4.9.1.3 Approve the LO/TO by signing, entering your S Number and dating the Approved By space on the Record Sheet.

#### 4.10 Installing a Level II Lockout and Tagout

**NOTE:** *If equipment design is such that installing the LO/TO prevents the performance of the zero energy verification, then the zero energy verification may be performed immediately prior to installing the LO/TO with approval of the PAE.*

4.10.1 AE: Install the LO/TO:

4.10.1.1 Coordinate other jobs and tasks in progress with the appropriate JS/F and Operations Manager(s) to prevent any adverse effects that performing the LO/TO may have on other facility equipment.

4.10.1.2 Notify the appropriate JS/F(s) and *affected employees* (see def.) that the equipment will be shut down for LO/TO.

4.10.1.3 Position, or have a qualified person position, the isolation devices in the sequence specified on the Record Sheet.

4.10.1.4 If specified on the Record Sheet, perform concurrent dual verification.

**NOTE 1:** *In some cases, the lock and danger tag may need to be posted in an area that puts the AE or AE/L at risk or they are not qualified to enter the area for posting (e.g., within the flash hazard boundary for co-posting a LO/TO on an electrical clearance). In this case, with the approval of the PAE, the AE or AE/L may have a qualified person install the*

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*lock and danger tag while they observe from a safe vantage point.*

**NOTE 2:** *The preferred technique for concurrent dual verification is an observation of the manipulation, the use of position indicators, gauges or other indicators.*

4.10.1.5 Lock out and tag out each isolation device as specified on the Record Sheet. Enter the lock number and sign/initial the Record Sheet and danger tags in the appropriate space as they are installed.

4.10.1.5.1 IF the isolation device field label does not correspond with the identification on the danger tag and Record Sheet, THEN STOP, notify the PAE before proceeding with the installation of the LO/TO.

4.10.1.5.2 Return and secure the keys for the locks installed in the field in a lockbox in the assigned control area for the LO/TO.

4.10.1.5.3 Install the final lock and danger tag on the lockbox and turn the lockbox key over to the assigned PAE for the LO/TO.

4.10.1.5.4 Enter the date installed on the LO/TO Index sheet in the LO/TO record book.

4.10.1.6 Have a qualified person(s) relieve, disconnect, restrain, or otherwise render safe any potentially stored or residual hazardous energy as necessary.

#### **4.11 Performing Zero Energy Verification**

4.11.1 AE: Perform or verify the following:

4.11.1.1 Perform or have a *qualified person* (see def.) perform the zero energy verification(s) specified on the Record Sheet.

4.11.1.2 IF hazardous energy is encountered during the zero energy verification, THEN STOP, contact the PAE and JS/F for further directions.

4.11.1.3 Zero energy verifications shall be signed off with signature, S Number and date in the Performed By space on the

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Record Sheet by the qualified person performing the zero energy.

#### 4.12 Accepting the Level II Lockout and Tagout

**NOTE:** *When reviewing the completion and adequacy of the LO/TO for acceptance, the Work Group Representative should take any actions necessary to evaluate and confirm the completion and adequacy of the LO/TO installation.*

4.12.1 Work Group Representative (see def.): Review the Record Sheet to confirm all zero energy verifications have been completed.

4.12.2 First Work Group accepting the LO/TO: Walk down the LO/TO to confirm proper identification and isolation of the hazardous energy sources.

4.12.3 All Work Group Representatives: Review the Record Sheet to confirm all zero energies have been completed. Walk down the LO/TO to confirm proper identification and isolation of the hazardous energy sources (optional - if desired) and accept the LO/TO by entering your signature, S Number and date in the appropriate spaces on the Record Sheet.

#### 4.13 Working Under a Level II Lockout and Tagout

4.13.1 AE, AE/L or Escorted Person: Review the Record Sheet to ensure that zero energy checks have been performed and signed off, your work group representative has accepted the LO/TO and the LO/TO has NOT been released.

4.13.2 Install your *personal lock* (see def.) on the lockbox.

4.13.3 Perform or observe a *Safe-to-Work Check* (see def) prior to starting work for that task or shift.

#### 4.14 Releasing the Level II Lockout and Tagout

4.14.1 Work Group Representative For Each Work Group: Check all work related to your work group is complete to a point that will allow release of the LO/TO.

4.14.1.1 The work area should be cleared of tools and non-essential items and is operationally safe for removal of LO/TO.

4.14.1.2 Check that all AE, AE/L and Escorted Person(s) from your work group have removed their personal locks from the lockbox.

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4.14.1.3 Release the isolation for your work group by entering your signature, S Number and the date in the appropriate released by space on the Record Sheet.

4.14.1.4 IF you are the last work group releasing the LO/TO, THEN Notify the JS/F, PAE and appropriate Operations Management that *servicing or maintenance* (see def.) is completed and all work groups have signed off the LO/TO.

#### **4.15 Authorizing Removal of the Level II Lockout and Tagout**

4.15.1 PAE: Review the Record Sheet to ensure that all work groups working under the isolation have released the isolation.

4.15.2 Identify the position in which the isolation devices are to be placed or remain upon removal of the locks and danger tags and enter it into the Record Sheet.

4.15.3 Determine (if qualified) or contact operations management to determine the need to check the positioning of other components that were not locked or tagged, but are related to the operation of the LO/TO component, to ensure that components within the LO/TO boundaries are correctly aligned to support operation.

4.15.4 Determine if any recovery actions are needed before authorizing removal of the LO/TO.

**NOTE:** *The removal sequence is an alpha/numeric (letters or numbers) entry. The same alpha/numeric designation may be used more than once if multiple isolation devices require the same sequence or may be removed in any logical sequence (e.g., a specific sequence or a generic sequence such as: lock 6 (lockbox) A/1 and locks 1 to 5 B/2).*

4.15.5 Use alpha/numeric (letter or number) designations to indicate the sequence in which the LO/TO is to be removed and enter them in the Record Sheet.

4.15.6 Authorize removal of the LO/TO by entering signature, S Number and date in the Removal Authorized By space on the Record Sheet.

#### **4.16 Removing the Level II Lockout and Tagout**

4.16.1 Qualified Person: Check the equipment start switch or other normal controls are in a neutral or “off” position.

4.16.2 Qualified Person: Confirm that isolation device positions will not create a hazard to personnel or equipment as LO/TO is removed.

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4.16.3 Qualified Person: Ensure employees are safely positioned.

4.16.4 AE: Remove the LO/TO as specified in the Record Sheet and initial the Record Sheet in the appropriate space as locks and danger tags are removed.

**NOTE:** *Danger tags that are contaminated (radiologically or otherwise) are not required to be returned to the PAE.*

4.16.5 AE: Return the Record Sheet and danger tags to the PAE.

#### **4.17 Closing Out the Level II Lockout and Tagout**

4.17.1 PAE: Review the Record Sheet and danger tags to ensure that all required (non-contaminated) danger tags have been accounted for and initialed in the removal spaces of the Record Sheet.

4.17.2 PAE: Close out the LO/TO by entering signature, S Number and date into the Closed Out By space on the Record Sheet.

4.17.3 PAE (or designated AE): Fill in the clearance date for the closed out LO/TO on the index sheet in the LO/TO logbook.

4.17.4 JS/F or appropriate Operations Management: Notify affected employees that the LO/TO has been removed.

#### **4.18 Performing a Level II Lockout and Tagout When an Isolation Device Cannot Be Locked Out**

4.18.1 AE: If the isolation boundary can NOT be changed to a lockable component, tag out the device as follows:

4.18.1.1 Fasten the danger tag directly to the isolation device, or as close as safely possible to the device, in a position immediately obvious to anyone attempting to operate the device

4.18.1.2 Enter “Tag Only” in the Lock Number space of the Record Sheet.

4.18.1.3 Use supplemental protective measures such as wedges, key blocks, adapter pins, or self-locking fasteners that physically secure the isolation device or remove a circuit isolating element, or danger tag two isolation points in series, or remove a valve handle.

4.18.1.4 Record the supplemental protective measures to be used in the additional instructions section of the Record Sheet.

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**4.19 Performing Additional Work Under an Existing Level II Lockout and Tagout or Adding Tags/Locks**

4.19.1 AE: Perform applicable steps of Section 4.1 to check the following:

4.19.1.1 IF the existing isolation boundary is adequate to isolate the hazardous energy types involved in the additional work, THEN:

**NOTE:** *Use Form 434.38A, "ICP Lockout/Tagout Record Sheet (Continuation)," as necessary.*

4.19.1.1.1 Enter the additional work control document number as a new line item on the LO/TO record sheet including the danger tag numbers required.

4.19.1.1.2 Enter signature, S Number and date in the Record Sheet in the appropriate space as the reviewer.

4.19.1.1.3 Present the Record Sheet to the PAE.

4.19.1.1.4 PAE: Approve the additional work by entering signature, S Number and date in the appropriate space on the Record Sheet.

4.19.1.2 IF the existing isolation boundary is NOT adequate for the additional work OR additional danger tags/locks are needed, THEN perform the following:

4.19.1.2.1 Determine the equipment position, isolation boundary, and number of danger tags necessary.

4.19.1.2.2 Determine any additional zero energy verification(s) required.

**NOTE:** *The identification of the isolation device in the field should agree with the identification on the Record Sheet and danger tag. If drawings and references do not agree with the field marking, this inconsistency should be brought to the attention of the PAE and engineering.*

4.19.1.2.3 Add the required information to the additional danger tags and record them in

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the applicable spaces of the Record Sheet as a new line item.

4.19.1.2.4 Enter signature and S number in the appropriate line on the Record Sheet as the reviewer.

4.19.1.2.5 Present the Record Sheet and additional danger tags to the PAE.

4.19.2 PAE: Review any additional danger tags, Record Sheet, and work documents for adequacy of the isolation, sequence (if needed), and zero energy verification.

4.19.2.1 Approve the additional line items by entering signature and S Number in the appropriate space of the Record Sheet.

4.19.2.2 Direct the AE to work in accordance with Steps 4.10, 4.11, and 4.12 to complete installation of the LO/TO.

**4.20 Partial Removal of a Level II Lockout and Tagout****CAUTION**

**Additional care is required when performing a partial removal of a Level II LO/TO, as abnormal equipment configuration may result.**

4.20.1 PAE/AE: Determine if a partial removal is appropriate for the LO/TO.

4.20.2 AE: Review the work control document(s) and applicable drawings for adequacy of the remaining equipment isolation.

4.20.2.1 Check that no new hazardous energy sources will be introduced.

4.20.2.2 Check that no new zero energy verifications are required.

4.20.2.3 Check that no new energy isolation devices are required.

4.20.2.4 Complete an additional line item for the danger tags that are to remain in place on the Record Sheet.

4.20.2.5 Prepare a new danger tag for the lockbox using the original tag number.

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- 4.20.2.6 Check that the active remaining line items are not affected by the partial clearance.
- 4.20.2.7 Sign the Record Sheet in the appropriate space as the reviewer.
- 4.20.2.8 Present the Record Sheet and new danger tag for the lockbox to the PAE.
- 4.20.3 PAE: Review the new danger tag for the lockbox, Record Sheet, and work documents for adequacy of the remaining equipment isolation.
  - 4.20.3.1 Coordinate with appropriate JS/F and Operations Management other jobs and tasks in progress to prevent any adverse effects that performing a partial removal of the LO/TO may have on other equipment.
  - 4.20.3.2 Check that the zero energy verifications are still valid for the remaining isolated equipment.
  - 4.20.3.3 Approve the LO/TO by entering signature, S Number and date in the appropriate spaces on the Record Sheet.
- 4.20.4 AE, AE/L and Escorted Person(s): All OSHA authorized employees locked onto the LO/TO remove their personal locks from the lockbox.
- 4.20.5 Work Group Representative From Each Work Group: Ensure equipment or system is in a condition to allow the partial clearance.
  - 4.20.5.1 Release the LO/TO for the affected line item(s) by entering signature, S Number and Date in the appropriate space on the Record Sheet.
- 4.20.6 PAE: Check that all work groups working under the affected LO/TO line item have released the line item(s) on the Record Sheet.
  - 4.20.6.1 Check that the active remaining line items are not affected by the partial clearance.
  - 4.20.6.2 Identify the removal position and sequence, if needed for the isolation devices.
  - 4.20.6.3 Authorize which locks and danger tags can be removed by entering signature and S Number in the appropriate lines of the Record Sheet.

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**NOTE:** *The PAE must be present at the lockbox when the AE unlocks and opens the lockbox. The PAE must remain at the lockbox until it is relocked and the new lockbox danger tag is attached.*

- 4.20.6.4 AE: Remove the designated keys from the lockbox.
- 4.20.6.5 Place the new danger tag and job lock on the lockbox.
- 4.20.6.6 Remove the designated locks and danger tags in the sequence specified in the Record Sheet.
- 4.20.6.7 Have a qualified person position each isolation device for which locks and danger tags were removed as specified on the Record Sheet.
- 4.20.6.8 Return the Record Sheet and the removed danger tags to the PAE.
- 4.20.7 PAE: Review the Record Sheet and danger tags to verify that the correct tags were removed.
  - 4.20.7.1 Ensure the Record Sheet is complete and accurate.
  - 4.20.7.2 Notify affected employees that the LO/TO has been modified.
- 4.20.8 Work Group Representative: Check that the remaining applicable zero energy verifications have been specified on the Record Sheet.
  - 4.20.8.1 Accept the new line item for the modified LO/TO by entering signature, S Number and Date in the appropriate space on the Record Sheet.
  - 4.20.8.2 Install your personal lock back on the lock box.

**4.21 Replacing a Missing or Damaged Danger Tag**

- 4.21.1 Person discovering Missing or Damaged Danger Tag: Inform the PAE.
- 4.21.2 PAE: If notification of missing or damaged danger tag is received, perform the following:
  - 4.21.2.1 Stop work associated with the LO/TO.
  - 4.21.2.2 Take appropriate actions to resolve the condition.

**NOTE:** *If the lock associated with the missing danger tag is still in place and the isolation device is still in the position*

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*indicated on the Record Sheet, a new zero energy confirmation may not be necessary. If the missing danger tag was tagout only, the PAE will confirm that the integrity of the LO/TO has not been compromised by the missing danger tag and take whatever compensatory precautionary actions or zero energy confirmations deemed necessary before restoring the danger tag and re-releasing the LO/TO.*

- 4.21.2.3 Record in the partial removal block that the danger tag is missing or damaged and initial in the “removed by” block.
- 4.21.3 AE: Prepare a replacement danger tag as follows:
- 4.21.3.1 Use the same number as the missing or damaged danger tag followed by an "R" to indicate replacement.
- 4.21.3.2 Record information for replacement of the danger tag on the Record Sheet and replacement danger tag.
- 4.21.4 PAE: Authorize installation of the replacement danger tag by entering signature and S Number on the Record Sheet.

**NOTE:** *Verification is not required for danger tag replacement unless determined necessary by the PAE.*

- 4.21.5 AE: Install the replacement danger tag.
- 4.21.6 PAE: Authorize work to recommence in accordance with Step 4.12.

#### **4.22 Removing a Personal Lock When the Employee is Not Available**

- 4.22.1 PAE: If a personal lock needs to be removed and the employee who applied the personal lock is not at the facility, perform the following:
- 4.22.1.1 Take all reasonable measures to contact the employee.
- 4.22.1.2 If unable to contact the employee, notify the employee’s immediate manager or supervisor to inform the employee before he/she resumes work that his/her personal lock has been removed and the reason why.
- 4.22.1.3 Direct the removal of the personal lock.

## **5. RECORDS**

Form 434.38, “ICP Lockout/Tagout Record Sheet”

Form 434.38A, “ICP Lockout/Tagout Record Sheet (Continuation)”

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Form 434.39, “ICP Lockout/Tagout Index Sheet”

**NOTE:** [MCP-557, “Records Management,”](#) the [INL Records Schedule Matrix](#), and associated [record types list\(s\)](#) provide current information on the storage, turnover, and retention requirements for these records.

## 6. DEFINITIONS

*Affected employee.* An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under LO/TO, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed. An affected employee is not trained to perform work under a LO/TO. All CWI employees receive training initially and are annually re-qualified to the level of affected employee by completing Safety and Health Access qualification.

*All other employees.* Employees who work or may be in an area where LO/TO may be utilized. This group of employees normally includes office workers, administrative and technical staff, custodians and so on. These employees typically operate cord and plug-connected equipment such as computers, copy machines, and custodial equipment that do not normally require LO/TO to perform servicing or maintenance of the equipment. There are no Company employees with access badges in the ICP considered to be in this category due to annual training provided to all employees to the level of *affected employee* (see def.)

*Authorized Employee, AE.* A CWI authorized employee with current qualification QCLTAUTH who may perform all aspects of a Level I or Level II LO/TO and performs modifications, servicing or maintenance under the protection of LO/TO on machines and equipment.

*Authorized Employee Limited), AE/L.* An employee trained to the CWI program with qualification QCLTWORK who may perform all aspects of a Level I LO/TO, but who may only accept (for themselves and a work group), release (for themselves and a work group) and work under a Level II LO/TO.

*Capable of being locked out.* An isolation device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other isolation devices are capable of being locked out if lockout can be achieved without the need to dismantle, rebuild, or replace the isolation device or permanently alter its energy control capability.

*Concurrent Dual Verification.* A verification technique where two individuals share the responsibility for performing an operation or verifying a condition. The activity is

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performed while both individuals are present and both individuals are responsible for ensuring that the activity is performed correctly.

*Electrically Safe Work Condition.* A state in which the conductor or circuit part to be worked on or near has been disconnected from energized parts, locked/tagged in accordance with established standards, tested to ensure the absence of voltage, and grounded if determined necessary.

*Energized.* Connected to an energy source or containing residual or stored energy.

*Exclusive Control,* Under the exclusive control of the employee means the authorized employee has the authority to and is continuously in a position to prevent (exclude) other individuals from reenergizing the machine or equipment during his servicing or maintenance activity, This can also be accomplished by installation of their personal lock.

*Group LO/TO Program.* A LO/TO program utilizing one common procedure for performance of LO/TO on multiple systems across multiple facilities in accordance with 29 CFR 1910.147(f)(3).

*Hazardous energy types.* Electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy identified through the hazard identification and mitigation processes defined by MCP-101, “ICP Integrated Work Control Process,” and MCP-3562, “Hazard Identification, Analysis and Control of Operational Activities.” Examples include:

- Electrical conductors and circuit parts operating at 50 Volts or more. [NFPA 70E]
- Any energy, including mechanical (e.g., power transmission apparatus, counterbalances, springs, pressure, gravity), pneumatic, hydraulic, electrical, chemical, nuclear, and thermal (e.g., high or low temperature) energies, that could cause injury to employees. Danger is only present when energy may be released in quantities or at rates that could injure employees.

**NOTE:** *Thermal energy may be generated as a result of electrical resistance, mechanical work, radiation, or chemical reaction, such as is the case with anhydrous ammonia, chlorine, or sulfuric acid reacting with skin, lung, or eye tissue causing chemical burns.*

- Hazardous chemical energy, for purposes of this standard, includes chemicals (e.g., flammable and combustible liquids; flammable gases; acids and alkaline chemicals) that may thermally produce burn injury through high or low temperature. [OSHA Directive CPL 02-00-147]

*Hot tap.* A procedure used in the repair, maintenance, and service activities on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or equipment used for a specific purpose or task. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemicals.

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*Isolation device.* A mechanical device that physically prevents the transmission or release of energy. Examples are a manually operated electrical circuit breaker, a fuse block, a fuse, a disconnect switch, a line valve (not a check valve), a slip blind, a wood or metal block, or any similar device used to block or isolate energy. Push buttons, selector switches, and other control circuit type of devices are not isolation devices. Typical isolation devices are valves and breakers or other equipment and piping that are normally installed as permanent fixtures in operating facilities. In this case, they shall be labeled in accordance with MCP-2987, “Chapter XVIII – Equipment and Piping Labeling” to ensure accurate identification and posting of LO/TO.

*Job lock.* A lock used to ensure the continuity of energy isolation during a multi-shift operation. It is placed upon a lockbox. The key to the job lock is controlled by the primary authorized employee.

*Lockbox.* Individual lockable boxes used for level II LO/TO into which all keys from the lockout devices securing the machine, equipment, or system are inserted and which would be secured by a job lock. A slot that allows the placement of keys in a permanently mounted lockbox may be used. However, the slot must be small enough to prevent the removal of any keys without removing the job lock.

*Lockout.* The placing of a lockout device on an isolation device according to the LO/TO procedure, ensuring that the isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

*Lockout device.* A device that utilizes a positive means such as a padlock to hold an isolation device in the desired position. Included are blank flanges and bolted slip blinds.

*Operations Management (OM).* (Also referred to as operations supervisor in DOE Order 422.1, “Conduct of Operations”) Managers, as defined in PDD-1005, “ICP Management and Operations Manual.” OM encompasses titles such as Nuclear Facility Manager, Building/Facility Manager, Operations Manager, Supervisor, Foreman, and others who have line management responsibilities. The OM is responsible for hazard identification, analysis, and control of an operational activity and the point of contact for resolving related issues.

*OSHA authorized employee.* As defined by OSHA, 29CFR1910.147(b), a person who has been trained and qualified to lock out or tag out machines or equipment in order to perform servicing or maintenance on that machine or equipment. The CWI LO/TO program has three types of OSHA authorized employees:

- *Primary Authorized Employee, PAE* (see def),
- *Authorized Employee, AE* (see def) and
- *Authorized Employee (Limited), AE/L* (see def).

Qualified electrical workers who are trained and qualified to perform clearances under 29CFR1910.269(d) are also considered to be OSHA authorized employees.

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*Performing work under LO/TO.* A vendor or sub-contractor may be escorted to work under CWI LO/TO ONLY if they are an *OSHA authorized employee* (see def) by receiving training in a CWI program, OR ,their parent company has documented LO/TO training equivalent to the minimum of a CWI Authorized Employee (Limited) confirmed by a PAE. If neither of these conditions are met, the vendor or sub-contractor may be escorted to OBSERVE and ADVISE CWI personnel as an *Affected Employee* (see def), but **MAY NOT PERFORM WORK** under protection of a CWI LO/TO.

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*Personal danger tag.* A CWI Form 434.12 that may be attached to a personal lock to identify the authorized employee who placed the personal lock and notify others that the lock shall not be removed by anyone other than the authorized employee owning and placing the lock.

**NOTE:** *CWI or CWI-direct personnel may use the CWI Form 434.12 personal danger tag to identify a personal lock. A BEA or other external contractor under escort may apply their company's personal danger tag if it meets the NFPA 70E warning criteria and OSHA employee identification criteria for a personal lock.*

*Personal lock.* A lock used to ensure the continuity of energy isolation while work is being performed by an authorized employee. A personal lock **MUST HAVE** labeling to indicate "DANGER – DO NOT REMOVE" **AND** identification of the person placing the lock by either labeling or stickers on the body of the lock or an attached personal danger tag.

**NOTE:** *A BEA or other external contractor under escort may apply their company's personal lock if it meets CWI criteria of red in color, durable, labeling and single-keyed.*

*Primary Authorized Employee, PAE.* An employee trained to the CWI program with qualification QCLTPRIM who exercises overall responsibility for LO/TO development, approval, installation, modification and removal in the company program.

*Qualified electrical worker.* An individual who is trained and qualified to perform electrical work as defined by PRD-5099, "Electrical Safety." Qualified electrical workers who are trained and qualified to perform clearances under 29CFR1910.269(d) are also considered to be *OSHA authorized employees* (see def).

*Qualified person.* A trained or experienced individual authorized to startup, operate, shut down equipment or perform zero energy verifications in accordance with approved procedures or other instructions. The qualified person is trained and qualified to perform the zero energy confirmation but may or may not be an *OSHA Authorized Employee* (see def.) for working under LO/TO. Personnel must be designated by appropriate *Operations Management* (see def).

*Safe-to-Work Checks.* A "test before touch" evaluation (ie. observation, gauges, venting, proximity testers, thermal sensors, etc.) and is performed or witnessed by each worker working under protection of a LO/TO. Individual workers should perform a safe-to-work check before beginning a work task under LO/TO and continually observe conditions in the work area, recognize the purpose of the LO/TO and practice a questioning attitude about potential hazardous energy or work steps that may challenge the integrity of the LO/TO during work tasks.

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*Servicing or maintenance.* Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines, equipment, or systems. 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.

*Tagout.* Placing a danger tag on an isolation device, in accordance with the LO/TO procedure, to indicate that the isolation device and the equipment being controlled cannot be operated until the danger tag is removed.

*Tagout device.* A danger tag and its means of attachment, that can be securely fastened to an isolation device in accordance with the LO/TO procedure, to indicate that the isolation device and the equipment being controlled cannot be operated until the tagout device is removed.

*Unattended.* For the purpose of NFPA 70E, Article 120.2(F)(2)(f)(4), electrical equipment that has been placed in an “electrically safe work condition” (locked/tagged out) shall be considered attended per NFPA 70E, Article 120.2(F)(2)(f)(4). Therefore, retesting for the absence of voltage is not required for equipment that has been placed in an “electrically safe work condition” using LO/TO, shall personnel leave the equipment, so long as the LO/TO has not been removed or modified or circuit conditions changed.

*Work group.* The work group is the group assigned to and pre-job briefed for the work to be performed under the protection of the LO/TO and may be individual crafts, operations, or support work groups such as radiological control technicians, safety engineers, quality inspectors, systems engineers, escorted persons, etc.

*Work group representative.* An AE, AE/L, Job Supervisor/Foreman, or designee representing a work group. This person represents the employees of his or her respective work group, when accepting and releasing LO/TOs. The work group may be individual crafts, operations, or individual support work groups such as radiological control technicians, safety engineers, quality inspectors, systems engineers, and so on.

## 7. REFERENCES

Form 434.11, “Danger Tag”

Form 434.12, “Personal Danger Tag”

Form 434.38, “ICP Lockout/Tagout Record Sheet”

Form 434.38A, “ICP Lockout/Tagout Record Sheet Continuation Sheet”

Form 434.39, “ICP Lockout/Tagout Index Sheet”

Form 434.42, “ICP LO/TO Requirements for Escort”

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MCP-3562, “Hazard Identification, Analysis, and Control of Operational Activities”

PRD-5051, “Lockout and Tagout”

MCP-101, “ICP Integrated Work Control Process”

## **8. APPENDIXES**

Appendix A, Procedure Basis

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## Appendix A

### Procedure Basis

Step	Basis	Source	Citation
3.2.1	Personnel assigned to perform LO/TO activities are qualified as a CWI Authorized Employee, AE, Authorized Employee (Limited), AE/L, or Primary Authorized Employee, PAE.	PRD-5051	Step 3.3
3.2.2	Personnel assigned to prepare LO/TO shall be knowledgeable on the equipment and systems for which they are preparing a LO/TO.	PRD-5051	Step 3.7.1.1
4.2.1.3 and 4.8.1.6	Determine the scope of work to be performed and the isolation boundary required.	PRD-5051	Step 3.7.1.2
4.2.1.4	Verify that ALL criteria for a Level I LO/TO have been met	PRD-5051	Step 3.7.2
4.3.2 and 4.9.1.2	Approve the LO/TO.	PRD-5051	Step 3.7.1.14
4.4.3 and 4.10.1.2	Notify affected employees that the equipment will be shut down for LO/TO.	PRD-5051	Step 3.7.1.3
4.4.4.1 and 4.10.1.6	Have a qualified person relieve, disconnect, restrain, or otherwise render safe any potentially stored or residual hazardous energy as necessary.	PRD-5051	Step 3.7.2.3 and 3.7.3.4
4.4.4.2 and 4.10.1.5	Install the LO/TO.	PRD-5051	Step 3.7.1.6
4.5 and 4.11	Perform zero-energy verifications.	PRD-5051	Step 3.7.1.8
4.7.4 and 4.17.4	Notify affected employees that the LO/TO has been removed.	PRD-5051	Step 3.7.1.13
4.8.1.11	If it is possible for stored energy to re-accumulate, to a hazardous level while work is performed then include a method to prevent re-accumulation.	PRD-5051	Step 3.7.3.5
4.12	Accept the LO/TO.	PRD-5051	Step 3.7.3.1
4.13.2	Install your personal lock on the lockbox.	PRD-5051	Step 3.7.3.6

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Step	Basis	Source	Citation
4.14	Inspect the work area to ensure your work group's portion of the equipment is ready for LO/TO removal.	PRD-5051	Step 3.7.1.11
4.15	Authorizing removal of the LO/TO.	PRD-5051	Step 3.7.1.14
4.16.3	Verify employees are safely positioned.	PRD-5051	Step 3.7.1.11. B
4.16.5	Return the LO/TO record sheet and danger tags to the PAE.	PRD-5051	Step 3.7.3.9
4.17.1	Review the LO/TO record sheet and danger tags.	PRD-5051	Step 3.7.3.9.1
4.18	Performing a level II LO/TO when an isolation device cannot be locked out.	PRD-5051	Step 3.2.8
4.22	Removing a personal lock when the employee is not available.	PRD-5051	Step 3.7.4.1