Revision Log

Pages Affected	Description of Revision
All	Procedure has been completely revised. The list below describes the overall changes: -Added Work Group Supervisor and Reviewer responsibilities -Eliminated L/T Holder (Supervisor/Lead) function -Added second person verification method with Facility Manager approval -Added new section for PECMC on portable equipment and vehicles -Added DNO, grounding and warning tags from 8Q-31 -Added guidance for safe energy determinations when working on batteries and lifting common neutrals -Revised guidance for dealing with spurious voltages and added new label -Revised approval requirements for adding activities to an “established” lockout -Clarified the definition of "non-intent" changes Expanded use and application of Additional Protective Measures (APMs) -Revised assessment guidance to include use of STAR template and trained/qualified assessors. -Added periodic fundamentals training -Added Table of Contents -Added Attachment 8.8, L/T Training Matrix -Edited for clarification, capitalization, and section/document reference updates.

Table of Contents

1.0 PURPOSE

The primary purpose of this procedure is to provide a system of hazardous energy control (HEC) for the protection of personnel. If a lockout is used to protect equipment from damage or prevent the release of hazardous material to the environment, then refer to Manual 2S, Procedure 5.9, *Hazardous Energy Control*. This procedure provides instructions for the isolation and restoration of equipment and systems to protect personnel from injury during maintenance, testing, inspections, training and similar activities. [S/RID 1, 24]

2.0 SCOPE

The provisions of this procedure apply to the Performing Entities at the Savannah River Site (SRS) and to subcontractors performing work for the Performing Entities when required by subcontract or applicable law.

This procedure may not apply to Department of Energy (DOE) contractors based upon the scope of the contract. However, when the Performing Entity has work to perform in conjunction with DOE contractors, the Lockout/Tagout (L/T) shall comply with this procedure. This work includes L/Ts involving L/T points on devices that belong to DOE contractors.

3.0 DEFINITIONS AND ABBREVIATIONS

See 8Q, Appendix A, *Glossary*.

4.0 RESPONSIBILITIES

4.1 Electrical and Instrument (E&I) Maintenance/Electrical Construction

Where assistance is required, E&I Maintenance or the appropriate craftsman is responsible for:

- Reviewing and approving L/Ts for locations and methods to be used in determining a Safe Energy State exists prior to L/T establishment with respect to work on or near exposed electrical conductors, circuit parts and/or electrically driven equipment, Inclusion of electrical safety steps when required in accordance with Manual 18Q, *Safe Electrical Practices and Procedures*
- Reviewing and approving instructions to install/remove grounds.

4.2 Engineering

Engineering (branch supporting facility operations) is responsible for:

- Being knowledgeable of the requirements to perform the task within the facility safety envelope
- Reviewing and approving L/T Orders, including all L/T Revisions, for System, Structures and Components (SSC) on the designated list of SSC to ensure Technical Safety Requirements (TSR), Operational Safety Requirements (OSR) Process Requirements (PR), and Technical Specifications (TS) issues are addressed and resolved

4.2 Engineering, (cont.)

- Specifying any additional reviews by "subject matter experts" on listed SSC
- Reviewing and approving documented electrical L/T Orders to ensure safe L/T boundary identification. This includes reviewing additional electrical work activities added to an established L/T.

4.3 Facility Manager (FM)

The FM is responsible for:

- Approving the L/T when two valve isolation is not utilized for isolation of systems that are at high pressure, (> 500 psi), high temperature (> 200°F), and/or contain hazardous materials
- Approving special L/T processes where required with approval from Health and Safety and review by the Area Safety Engineer
- Obtaining approval of any standing orders for facility specific L/T implementation information from Health and Safety and communicating that information to facility personnel
- Approving all waivers for Independent Verification as outlined in this procedure
- Evaluating the need to conduct facility specific or refresher training as deemed appropriate based on their facilities HEC performance and lessons learned
- Approving the use of diaphragm air operated valves as primary L/T points.

4.4 L/T Facility Assessor

The L/T Facility Assessor is responsible for:

- Conducting L/T assessments as directed by the Operations Manager
- Verifying compliance of established L/Ts with the requirements of this procedure
- Recording and forwarding an L/T Assessment Report to Facility Management that contains the results of the assessment and corrective actions with due dates, if applicable
- Ensuring the Shift Manager is promptly informed of discrepancies that require immediate corrective action.

4.5 L/T Determiner

The L/T Determiner is responsible for:

- Ensuring that a Safe Energy State exists for the identified work scope
- Being qualified in the area of expertise in which they are tasked to make a determination that a Safe Energy State exists; i.e., Electrical and Instrument Maintenance/Mechanical Maintenance/Rigging (may be more than one discipline)
- Determining the proper location(s) and methodology used in verifying that an installed L/T provides a Safe Energy State for the identified work scope.

4.6 L/T Holder

Any employee, including those in a support role who is exposed to potential physical harm as a result of an unexpected release of a hazardous energy source, must be signed on the L/T. This representation may be via a "L/T Support Holder" or "L/T Worker". All L/T Holders must be appropriately trained.

4.6.1 L/T Worker Holder

A worker signing onto the L/T Order can only accept adequacy of the L/T for him or herself and has the right to place a lock with label on the lockbox. Workers (with supervisor's approval) performing a L/T in remote areas may accept and release the L/T Order using the communications techniques described in Manual 2S.

The Individual L/T Worker Holder is responsible for:

- Reviewing the L/T Order to ensure the L/T boundary provides adequate personnel protection for the intended work scope
- Ensuring that an established L/T is adequate to safely accommodate new activities prior to concurring with Shift Manager to approve the added work scope
- Ensuring single L/T protects them for the task being performed
- Performing the verification of isolation, and signing the L/T Order block titled, "lockout/tagout holder's acceptance". This signature documents acceptance of the L/T for the work performed under the specific activity number (if desired, may also place a lock with label on the L/T lockbox and maintain possession of the lock key)
- Releasing the L/T after completion of work.

4.6.2 L/T Support Holder

Personnel providing a support function to other work groups [e.g., Radiological Protection (RP), Quality Inspector, etc.] may be exposed to the hazardous energy in certain phases of the task. Support Group personnel can only participate in documented L/Ts. Participation in a SPLT is prohibited. Request a documented L/T if representation on an L/T is needed.

The L/T Support Holder is responsible for:

- Signing the L/T Order block titled, "Lockout/Tagout Holder's Acceptance". This signature acknowledges their involvement in work performed under the specific activity number and signifies their potential exposure to the hazardous energy (if desired, they may also place a lock with label on the L/T lockbox and maintain possession of the lock key)
- Recognizing when they are exposed to hazardous energy sources and appropriately signing onto the L/T.

4.7 L/T Operator

NOTE

Operators (with supervisor approval) performing a L/T in remote areas may accept and release the L/T Order using the communications techniques described in Manual 2S.

The L/T Operator functions are divided into four separate functions (L/T Installer, L/T Installer Verifier, L/T Remover and L/T Remover Verifier) with responsibilities for:

- Installing L/Ts in accordance with this procedure and the L/T Order; this may include signing onto a supporting facility L/T as a L/T Holder for a Multi-Facility L/T
- Verifying L/Ts (during installation and removal) in accordance with this procedure and the L/T Order; this may include signing onto a supporting facility L/T as a L/T Holder for a Multi-Facility L/T
- Removing L/Ts in accordance with this procedure and the L/T Order; this may include signing for release of a supporting facility L/T as a L/T Holder for a Multi-Facility L/T.

4.8 L/T Preparer

The L/T Preparer is responsible for planning and developing the L/T Order using this procedure, Attachment 8.7, *Preparer's Guide*, and other approved documents as required for guidance.

L/T Preparers shall not perform the reviewer function, unless approved by the Facility Manager.

4.9 Mechanical Maintenance/Rigging

Where assistance is required, Mechanical Maintenance/Rigging or the appropriate craftsmen are responsible for reviewing and approving L/Ts for the following:

- Application of blocking devices
- Line breaks (see Manual 8Q, Procedure 36, *Process System Access*).

4.10 Operations Manager

The Operations Manager is responsible for:

- Ensuring personnel safety remains paramount in all applications/interpretations of policy related to L/T
- Ensuring assessments are performed at the specified frequencies to determine whether procedures are being followed and to correct any observed deviations or inadequacies. [S/RID 8]

4.11 Operations Reviewer

> **NOTE**
>
> The review signature in block 8 of the L/T Order shall be signed by the cognizant manager of each affected department or their designee.

The Operations Reviewer is responsible for:

- Determining the required reviewers, in addition to Operations and the Work Group Supervisor, based on the overall responsibility guidelines. Specify on the L/T Order in Section 8 those additional departments required to review the L/T Order. This includes reviewers for added activities to a L/T.
- Ensuring the L/T boundaries are adequate and the L/T is safe for the work to be performed
- Marking N/A for those listed departments not required in block 8
- Reviewing the DNO Tags for the L/T Order.

4.12 Health and Safety

Health and Safety is responsible for:

- The content of this procedure, its periodic review, and revision
- Reviewing and approving new devices used as Additional Protective Measures
- Reviewing and approving special L/T processes as requested by the Facility Manager
- Providing approval of standing orders/facility specific L/T implementation information
- Establishing and chairing the Site Lockout Interpretations Committee (SLIC).

4.13 Area Safety Engineer

Area Safety Engineer is responsible for:

- Reviewing special L/T processes, as requested by the Facility Manager
- Reviewing and approving L/T Orders, as requested by the Shift Manager.

4.14 Shift Manager

The Shift Manager is responsible for:

- Performance of this procedure and has overall authority and responsibility for all L/Ts; this authority may be delegated except where specifically prohibited by inclusion of the following emboldened statement: **"This signature shall not be delegated"**
- Determining the effect and understanding the impact of the L/T on other activities in progress or those about to be started and the facility's capability to support it and does not conflict with existing L/T boundaries
- Ensuring that, when the L/T involves lifting, and/or landing leads; installing and/or removing flanges, appropriate Post Maintenance Testing for restoration is conducted per the work document that the L/T is providing protection for
- Ensuring proper safety precautions are followed for every L/T affecting their area of responsibility
- Where venting is required, ensure atmospheric vents and drains are DNO-Tagged OPEN and locked to prevent the possibility of re-accumulation of stored energy to hazardous energy levels.
- Authorizing Installation, Removal, and Revision(s) of ALL L/T Orders. **This signature shall not be delegated.** Signatures may be obtained in accordance with Manual 2S, Procedure 1.1, *Procedure Administration*, on "Alternate Methods of Documenting Approval/Concurrence"
- Reviewing the L/T Order for completeness and establishing a "Safe Energy State". **This signature shall not be delegated**
- Ensuring all L/T protection for a task is provided by a single L/T Order. (This includes Multi-Facility L/Ts.)
- Verifying appropriate review signatures are on the L/T Order. Operations reviewers and the Work Group reviewers are always required to review the L/T Order and sign block 8
- Coordinating Multi-Facility L/Ts
- Maintaining the L/T logs, both documented (OSR 20-147, *Lockout/Tagout Log*), and single point [OSR 20-177, *Single Point Lockout/Tagout (SPLT) Log*]; established L/T Orders, and controlling the keys for established L/T point(s) [S/RID 4, 5]
  - An exception to this requirement is when a Single Point Lockout/Tagout (SPLT) is utilized, in which case, the L/T key is controlled by the SPLT Holder and an L/T Order is not used
- Reviewing the L/T Order with appropriate affected personnel before beginning work. Where an exception to Independent Verification requirements exists, the Shift Manager must communicate the exception to the affected personnel
- Determining if Independent Verification is required during the removal of the L/T in accordance with the requirements of Manual 2S, Procedure 5.7, *Independent Verification*.
- Obtaining Engineering approval for electrical and designated SSC activities added to a L/T.

4.15 Subcontract Technical Representative (STR)[S/RID 3]

The STR is responsible for:

- Coordinating the equipment L/T before allowing the subcontractor to begin work
- Ensuring subcontractors, vendors, consultants have completed the required "Hazardous Energy Control" training needed to understand their L/T responsibilities and limitations prior to beginning work.

4.16 Work Group Supervisor (WGS)

The person performing the WGS (e.g., Construction, Subcontractor, E&I or Mechanical Maintenance) function is responsible for:

- Reviewing the L/T Order for personnel safety and proper boundary for work scope, and signing onto the L/T Order as Work Group Reviewer
- Ensuring that an established L/T is adequate to safely accommodate new activities prior to concurring with the Shift Manager to approve the added work scope
- Providing personnel to accompany the L/T Operator(s) to prevent the delay of L/T installation when the work group exercises the right to witness L/T installation
- Ensuring all L/T protection for a task is provided by a single L/T Order.

5.0 REQUIREMENTS

5.1 Exceptions and Clarifications

NOTE

When planning a L/T, the clarifying information given in this section, is intended for unique situations that depart from a routine Documented L/T. Attachment 8.2, directs actions required to support a routine documented L/T. Attachments 8.4, *L/T Revisions, 8.5, Grounding*, and 8.6, *Multi-Facility L/T, direct actions when invoking L/T Revisions, Grounding and Multi-Facility L/Ts*.

5.1.1 L/T Requirements Exceptions[S/RID 2, 3]

1. A properly administered L/T program, as part of disciplined facility operations by properly trained and qualified personnel, provides the primary means of controlling the position of energy-isolating devices in order to protect personnel, equipment, and the environment from inadvertent release of energy or hazardous material. Exceptions to the requirement of using a L/T include the following:
    - OSHA exceptions for minor servicing, cord and plug, and hot tap explained in the, OSR Form 20-201, *Lockout Process Exemption Determination Flowchart*. The minor servicing exception must be documented on OSR 20-201 and retained with the Technical Work Document or Procedure History File as appropriate.
    - Exceptions to the Basic Rules for Electrical Work as defined and illustrated in Manual 18Q.

5.1.1 L/T Requirements Exceptions[S/RID 2, 3], (cont.)

2. Additional exceptions to this procedure must be approved by the Environment, Safety, and Health (ESH) Manager.

5.1.2 Interpretations

Interpretations Board – Specific situations, or unusual conditions, may require an interpretation of this procedure and its requirements. In order to ensure consistency of application across the Site and monitor for adverse trends, a Site Lockout Interpretations Committee (SLIC) has been designated by Senior Management Staff. The purpose of this committee is to review HEC events for trends and recommend changes and to review requests for an interpretation from a facility or division, determine compliance with the requirements of this procedure of the request, and to approve or disapprove the request in conjunction with Health and Safety. All approved interpretations will be communicated to the Site through the Safety Home Page, and distribution through to the Facility Managers' Forum.

5.2 Tags

5.2.1 DANGER — Do Not Operate (DNO)

Use OSR 20-154, *Danger - Hazardous Energy Control* tags (Stores Caption 26, Item 16162.90) for protection of personnel, to prevent damage to equipment, and to prevent unauthorized releases to the environment.

Instructions for completing a DANGER -- Hazardous Energy Control -- Do Not Operate tag

The Lockout/Tagout (L/T) preparer fills in tag blanks 1-4 with the correct information.

Block Number/Action:

1. Lockout/Tagout No.
2. Tag No.
3. Component/Equipment ID
4. Required Position
5. The First L/T Operator installing the tag signs "Installed by" blank.
6. The First L/T Operator installing the tag places the "Date" in the date blank.
7. The Second L/T Operator verifying the tag signs "Verified By" blank.
8. The Second L/T Operator verifying the tag places the "Date" in the date blank.

Tag attachment means shall be of a non-reusable type, attached by hand, self-locking, and non-releasable with a minimum locking strength of not less than 50 pounds. The general design and basic characteristics shall be at least equivalent to a one-piece, all-environment-tolerant nylon cable tie (Stores - Caption 11, Item 22460.00).

EXCEPTION

Where nylon ties cannot be attached to the component being locked/tagged, the tag may be attached using an alternate means to ensure the component is identified as part of the lockout/tagout order (e.g. taping a tag to the exterior of a glovebox). .

5.2.1 DANGER — Do Not Operate (DNO), (cont.)

DANGER - Hazardous Energy Control - Do Not Operate Laser-printable tags (Stores - Caption 26, Item 16162.80) are also available for use.

OSR 20-155, *DANGER - Hazardous Energy Control - Do Not Operate* adhesive labels (Stores - Caption 26, Item 14213.00) are available for use where the size of the tag is an obstruction.

5.2.2 Lock-Out Label

Instructions for Completing a LOCK-OUT Label

The L/T Holder will complete the OSR 20-156, *Lockout* label (Stores - Caption 26, Item 14214.00) blocks.

Block/Action:

- Name - Name of L/T Holder applying the label and lock
- Dept./Phone - L/T Holder enters their department and phone number.

5.2.3 WARNING — Grounding

OSR 18-49A, *Warning for Electrical Grounding tags* (Stores Caption 26, Item 13400.00) are used for tagging grounding cables or shorting devices when the Hazardous Energy Control (Lockout/Tagout), Manual 8Q, Procedure 32 has been administered. The attachment means is of a non-reusable type, attached by hand, self-locking, and non-releasable with a minimum locking strength of no less than 50 pounds. The general design and basic characteristics are at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.

Instructions for completing an "Electrical Grounding Tag"

The L/T Shift Manager, E&I, or Construction Supervisor fills in the following blanks 1 - 4 with the correct information.

Block/Action:

1. L/T #
2. Tag #
3. Switch/Device ID
4. Switch/Device Location
5. Installer signs "Installed By".
6. Installer signs "Date".

5.2.4 WARNING - No Entry Without Permission

OSR 7-200A, *Warning No Entry Without Permission* tags (Stores Caption 26, Items 10645.00) are plastic and are reusable. They are used to control entry into an area/enclosure and to warn those authorized to enter of the "Tag Only" L/T point within the area/enclosure. Warning tags may be installed on the entry door or enclosure in plain view.

Instructions for Completing WARNING Tag

Block/Action:

1. Tag number (optional).
2. Enter location tag will be used.
3. Enter reason for tag. ("For L/T purposes")
4. Enter additional protective equipment/actions required.
5. Person installing, signs block 5.
6. Person installing, enters date.

On back of card PRINT NAME and PHONE # of authorizing person. (This may be a function or title, for example, Shift Manager, Safety Engineer, Custodian, etc.)

5.2.5 Warning- Spurious Voltage Jumper Labels

OSR 18-128, WARNING - Spuri*ous Voltage Jumper*, labels are used to identify and control spurious voltages per Attachment 8.2.

Instructions for Completing a Spurious Voltage Jumper Label

The L/T Holder will complete the Spurious Voltage Label (OSR 18-128) blocks for:

- L/T #
- Jumper #

5.2.6 Use of DNO – Tags

DNO tags with locks (long shank lock, Stores Caption 21, Item 1405.00) are used on primary L/T points when the energy isolation device is capable of being locked out (has a hasp of other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it).

DNO tags without locks can be used on primary L/T points when the application of locks is not possible (or as permitted in this procedure). However, a minimum of at least one, Additional Protective Measure, must be provided and documented on the L/T Order in the block titled, "Instruction/Component/Identifier/Description" or in the SPLT Log in the block titled, "Additional Protective Measures".

EXCEPTION

DNO Tags without locks is permitted for secondary L/T points without an Additional Protective Measure.

1. DNO - Tags are essentially warning devices and do not provide the physical restraint that is provided by a lock.

5.2.6 Use of DNO – Tags, (cont.)

2. DNO - Tags may evoke a false sense of security; to be effective, without exception, All employees must clearly understand and obey the warning "DO NOT OPERATE".
3. DNO - Tags must be legible and understandable.
4. DNO - Tags are NOT to be removed without proper authorization, they are NEVER to be bypassed, ignored or otherwise defeated.
5. DNO - Tags and their means of attachment must be made of materials that will withstand the environmental conditions in which they are placed.
6. DNO-Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

Missing, damaged, faded or illegible DNO Tags

When DNO tags are missing, damaged, faded or illegible, the following actions should be taken:

1. Use component identifier.
2. Make an additional entry on the L/T Order in the block titled, "Instruction/Component/Identifier/Description", specifying the DNO-Tag is missing, damaged, faded, or illegible and a replacement tag has been applied to the L/T point.
3. Issue a replacement DNO-Tag, identifying it as such, with the phrase, "Replacement Tag", written on it.
4. Use the same DNO-Tag number as the original.
5. Transfer the applicable L/T Order information to the replacement tag.
6. The Installer and Verifier will sign the replacement tag.
7. Verify the replacement DNO-Tag has been properly installed on the appropriate L/T point.
8. Verify that the damaged or illegible tag was removed from the L/T point and destroyed.

5.3 General L/T Information

5.3.1 Additional Protective Measures

1. The use of one or more approved Additional Protective Measures (APMs) is required when using a DNO-Tag without an accompanying lock.
2. Health and Safety approval is required prior to using any new APM other than those listed Document SRNS-J1000-2011-00003 (See “Guidance Documents”), as an approved Additional Protective Measure.
3. For L/Ts involving circuit breakers, facilities may elect not to use locks due to the weight of the lock acting on the breaker handle. In these situations, the use of a breaker device (screw or cam lock design) that can be directly attached to the breaker without an accompanying lock is permitted. The DNO-Tag will be securely attached to the device where provision has been made for hanging a lock.

5.3.1 Additional Protective Measures, (cont.)

4. For L/T's involving lifting battery leads, facilities may elect to not use locks due to the potential of the lock causing an electrical short. In these situations, the use of a plastic clamshell over the lifted battery lead or taping over the battery lead with electrical tape without an accompanying lock is permitted. When using the plastic clamshell, the DNO-Tag will be securely attached to the clamshell where provision has been made for hanging a lock. When taping the battery lead, the DNO-tag will be securely attached to the lifted battery lead.

   In the situations above, the breaker device, clamshell or electrical tape provide a physical barrier of safety which is as an Additional Protective Measure.

   When using Additional Protective Measures with documented lockouts:

   - The L/T Installer positions the component, installs the additional protective measure and hangs the DNO tag.
   - The L/T Verifier verifies the component position and proper installation of the Additional Protective Measure and the DNO tag.

   When using Additional Protective Measures with SPLT's, the SPLT Holder performs the installation and verification steps as specified in Attachment 8.3.

ADDITIONAL PROTECTIVE MEASURES (APMs)	
Acceptable for Documented L/T's **only**:	Acceptable for Documented **and** SPLT's:
• Removal of a fuse, then lifting, and DNO tagging the lead(s). • Removal of valve operating devices (handwheels, handles, etc.). • Height of pole and use of specialized tools and equipment (e.g., bucket truck) for access to overhead electrical line devices. • When no other method will isolate the L/T point, the work group may station an observer by the L/T point during the entire time that any work is being performed. (This observer will have no other concurrent duties.)	• Physical devices such as breaker clips, cam lock breaker devices or clamshells that are attached to or cover the energy isolation device are to prevent movement or unintentional access. Taping leads with electrical tape provides a physical and insulation barrier to prevent electrical shorting from unintentional contact. • Warning Barricade around the L/T point per Manual 8Q, Procedure 9 or in the case where a rope barricade is not possible/practical due to space or obstructions, then a Warning Tag (OSR 7-200A) may be placed on the entry door or component enclosure. In either case, ensure the phrase "For L/T Purposes" is written on the Barricade sign or Warning Tag to warn employees that they are approaching a "Tag Only" L/T point. • Removal of a fuse, then installing a fuse "block out" device and placing a DNO-Tag on the device. • Removing and tagging a fuse. While this option meets the intent of OSHA, it is discouraged due to the potential for someone to inadvertently insert a "spare" fuse.

5.3.2 Multiple L/Ts on Same Component

Occasions will arise when different L/T Orders require L/T of the same energy isolating device. It is acceptable to have several DNO-Tags and locks from several different L/Ts installed on the same energy isolating device as long as all of them require the device to be in the same position.

5.3.3 Changes to L/Ts

1. Non-intent changes are grammatical changes (editorial, punctuation, spelling) and may be made to a L/T Order by the Shift Manager. Non-intent changes may also include those changes which do not affect the actual Safe Energy State boundary for the work to be performed (i.e. field preparation and/or restoration activities associated with the lockout).
2. Intent changes include, but are not limited to, changing components and/or changing component positions. When intent changes are made to a L/T Order, the same reviewing group(s) who reviewed the original L/T Order initial next to where the changes are made.

5.3.4 Adding Activities to Established L/Ts

The Shift Manager may add an activity to an established L/T when all of the following criteria are met:

- An established L/T Order covers a new proposed activity,
- The activities in progress are compatible with the activity being added, and
- The L/T Holder(s) or workgroup performing the added activity concur by initialing L/T Order.

When it is determined by the Shift Manager that an established L/T Order covers the added work scope, the activities in progress are compatible with the activity being added, and the L/T Holder(s) or workgroup performing the added activity concurs.

Then the Shift Manager documents this decision by:

- Writing the activity number in the block titled, "Activity Number" on the L/T Order
- Initialing the block titled, "Shift Manager Activity Approval (Initial)" on the L/T Order authorizing the work to be added to the established L/T
- Ensuring original reviewers ,WGS ,Engineering (as applicable) or other support functions initial next to the activity
- Ensuring reviewers shall place initials and printed name in block titled, "Initials and printed name of person(s) who initialed L/T Order" (First time only).

5.3.5 Independent Verification (IV) not required

Independent Verification on installation of all L/T points is required except for a Single Point L/T, or when the Facility Manager determines minimal access to the point is required due to exposure hazards such as high radiation/contamination. When the verification has been waived, an alternate means of verification such as Second Person Verification (SPV) per Manual 2S, Procedure 5.7 shall be considered first before waiving the need to eliminate any verification Each situation must be evaluated on a ” case by case“ basis.

5.3.5 Independent Verification (IV) not Required, (cont.)

The FM signs signifying approval for waiving the Independent Verification (IV) in the L/T Order. The L/T Preparer is to add instructions in the L/T Order to include step(s) for:

- Justification for waiving IV
- Specifying alternate method of verification or no verification performed
- Facility Manager approval (printed name, signature and date).

5.3.6 L/T Installer (No Verification Required)

> **NOTE**
>
> The items in Steps 1 – 3 below can be performed in any sequence.

1. Install the DNO-Tag and lock (if able), and enter the key numbers in the associated block titled "Key Number (optional)" on the L/T Order.
2. Initial the L/T Order, as required, upon completion of each step.
3. Place initials and printed name in block titled, "Initials and printed name of person(s) who initialed L/T Order". (First time only)
4. When all the locks have been installed, deposit the L/T keys in the lockbox ensuring there is a key for each locked point. If no locks were used, (only APMs) go to next step.
   - Install DNO Tag and lock on the L/T lockbox
   - Sign the DNO Tag.
5. Initial the L/T Order.
6. Return the L/T Order to the Shift Manager.

5.3.7 Unavailable L/T Holder Release - Exception

> **! WARNING !**
>
> **The safety of personnel shall be maintained at the highest level possible when a L/T must be removed.**

L/T Holders are responsible for releasing the L/T after completion of the work by signing off of the L/T order. Some events or conditions may arise that require the removal of an L/T when an L/T holder is unavailable for release. Every effort will be made by management to contact the L/T holder for release using communication techniques described in Manual 2S. When an L/T Holder is unavailable and cannot be contacted, and the equipment is deemed necessary for operation, the Shift Manager shall obtain concurrence of the release from the L/T Holder's Facility Manager or equivalent level prior to initiating release.

5.3.7 Unavailable L/T Holder Release - Exception, (cont.)

Shift Manager

1. Authorize an Unavailable L/T Holder Release using the following steps:
   A. Verify the affected equipment can be safely unlocked and positioned.
   B. Verify employees, tools, etc., are clear of the affected system.
   C. Authorize removal of tags and locks, including cutting of locks.
   D. Document the L/T Holder's FM concurrence next to each "L/T Holder's Signature Release" per Manual 2S method in the L/T Order.
   E. Print the phrase "Unavailable L/T Holder Release" under the Shift Manager's signature, in the block titled, "Authorization to Remove L/T", of the L/T Order.
   F. Ensure that the affected L/T Holder has knowledge of the release before resuming work at the facility.

5.4 Administration

5.4.1 Filing Established L/T Orders

1. The "Established" L/T Orders will be maintained in a L/T Log or a L/T File.
2. Maintain the L/T Log or File in a central location that is accessible to the Shift Manager.

5.4.2 Lockout/Tagout Log Instructions (OSR 20-147)

1. The Shift Manager has responsibility for ensuring the L/T log is maintained current. [S/RID 5]
2. When form does not provide enough room/lines, the use of another sheet is proper. Page numbers are sequential for each attachment.

Block	Action
1.	Enter applicable area/facility (F Canyon, FB Line, 100 K, etc.).
2.	Enter sequential page number.
3.	Enter L/T number. The number consists of three parts Area/facility-Year-Sequential number (100K-97-0001).
4.	Enter system number if applicable (may be omitted from form if systems are not defined).
5.	Enter brief description of equipment that is to be Locked/Tagged out.
6.	Enter work activity number (work request #, SOP #, etc.). Only one number is required.
7.	Enter date and time L/T was Established.
8.	Enter date and time L/T was Released.
9.	Enter the date the L/Ts and Log were assessed and any pertinent comments.

5.4.3 Assessments and Discrepancies [S/RID 6, 8]

NOTE

Administrative facilities, inactive facilities surplus facilities and portable equipment maintenance (specifically for PECMC) are only required to have annual assessments. Facilities conducting monthly assessments will also conduct an annual roll up assessment of the previous year's performance, which can be combined with one of the Monthly Assessments in the first quarter of the CY.

Operations Manager

1. Schedule monthly and annual facility assessments. Annual assessments must be completed in the first quarter of each calendar year.
2. Ensure a monthly and annual assessment of the facility established L/T Orders are performed as scheduled including both Documented and Single Point L/Ts.
3. Assign assessors that are trained in hazardous energy control program, assessor trained, and were not involved in the installation or verification of the L/T Orders being assessed. . It is acceptable to team a trained assessor with a trained person on the hazardous energy control program to perform the assessments.

L/T Facility Assessor

1. Perform and document the facility L/T assessments (monthly and/or annual) as specified by 12Q, SA-1, *Self Assessment* using the lines of inquiry defined in the site L/T assessment template 2013-SA-002174.
2. Discrepancies identified during the assessments shall be handled as specified in Manual 1B, Procedure 4.23, *Corrective Action Program*..
3. Document all assessments in STAR.
4. Promptly communicate to the Shift Manager all discrepancies that require immediate correction.
5. Inform Facility Management of the assessment results.
6. Annual assessments shall be completed by the end of the 1st quarter of each calendar year.
7. Must be a trained assessor and trained in the Hazardous Energy Control Program. It is allowable to team a trained assessor with a trained HEC person.

Shift Manager

1. Resolve all discrepancies that require immediate action such as missing or illegible DNO tags, lockout hasp not fully engaged, no approved Additional Protective Measure (APM) when locks not used, or L/T Order and component position do not match.

5.4.3 Assessments and Discrepancies, (cont.)

2. For missing, damaged, faded or illegible DNO tags, see “Use of DNO Tags” for specific guidance on actions.

L/T Program Assessor

1. Perform a review of completed facility assessments in STAR.

2. Review Lessons Learned documentation to determine if issues regarding hazardous energy control (Lockout/Tagout) were communicated to affected facility personnel.

3. Review other assessments and performance analysis data from STAR in the previous calendar year.

4. Use STAR template 2014-SA -00832 as guidance to perform the annual program assessment. Annual program assessment shall be completed by the end of the second quarter of each calendar year and documented in STAR.

5. Must be a trained assessor and trained in Hazardous Energy Control Program.

5.5 Training [S/RID 3, 17, 18, 19, 21, 22]

1. All employees will be made aware of the safety significance of this procedure, including the prohibition relating to attempts to reposition components which are DNO-Tagged/Locked-Out. The information is procedure based and presented in General Employee Training. [S/RID 3,17]

2. L/T functions for Preparers, Reviewers, Shift Managers, Operators, Determiners, Worker Holders, and Assessors must complete the “Initial Hazardous Energy Control Training” and complete a Job Performance Measure (JPM) properly demonstrating skills required to perform their L/T function(s).[S/RID 3, 17]

5.5 Training, (cont.)

3. Facility Managers and Operations Managers must complete "Hazardous Energy Control Training for Facility and Operations Managers" to ensure they are knowledgeable of this procedure's requirements and intent in order to manage implementation of this procedure. [S/RID 3, 17]

4. L/T Support Holders must complete "HEC for Support Personnel" or an approved equivalent by Health and Safety, that highlights their responsibilities and the processes in place to protect them while signed on to the L/T as a L/T Support Holder.

5. Every two (2) years, every person involved in the Hazardous Energy Control Program must complete refresher training.

6. Facility Management can at anytime conduct facility specific or refresher training as deemed appropriate based on their facilities HEC performance and lessons learned. The content, method and affected population will be determined based on the need. .

7. Retraining shall be provided for all employees when there are significant changes to this procedure as identified by Health and Safety.

8. Vendor Technical Representatives, Service Representatives and Maintenance Service Providers must complete "Initial Hazardous Energy Control Training and complete a JPM properly demonstrating skills required to perform their L/T function(s) when contractually required to follow the site's HEC program (Manual 8Q, Procedure 32) [S/RID 3, 17].

   An exception to this requirement is when the Vendor Technical Representatives, Service Representatives or Maintenance Service Providers job scope does not exceed five working days on site within a calendar year. In these unusual situations, the responsible organization shall conduct a HEC briefing, or approved equivalent, on the requirements of this procedure for Vendor Technical Representatives, Service Representatives and Maintenance Service Providers who provide technical assistance or perform maintenance work. When the briefing is complete and all questions/concerns have been addressed, document the briefing by having the representative/service provider sign an attendance roster. This briefing does not qualify the representative/service provider to work as an authorized L/T Worker Holder. An authorized L/T Worker Holder, after the briefing, must continuously escort the Vendor Technical Representatives, Service Representatives or Maintenance Service Providers. These workers must sign on and off of the L/T Order on page 3 to account for their involvement in the Lockout. Also, to identify the authorized L/T Worker Holder under whom they are escorted and working, print the authorized L/T Worker Holder's name under the worker's printed name in the "L/T Holder's Acceptance" Block on the L/T Order. The Activity Approval will be N/A, since the activity will already be approved when the authorized L/T Worker Holder signs on the lockout for the specific activity. [S/RID 3]

5.5 Training, (cont.)
Step 9, (cont.)

The HEC briefing shall include as a minimum:

- Manual 8Q, Procedure 32 requirements (stressing that the DNO tag and locks/locking devices will not be violated),
- The scope of work covered by the L/T,
- The boundaries of the L/T as it relates to what portion of the system that may be worked on, and
- The requirement for continuous escorting during the duration of the work.

9. Health and Safety serves as Subject Matter Experts (SMEs) to Site Training for training development. Site Training designs, develops, and delivers approved training materials to site divisions.

10. The “Initial Hazardous Energy Control Training“ shall include material on how lockouts can hinder facility operations, particularly when local component operations are necessary while remote controls are locked out. [S/RID 18]

11. The “Initial Hazardous Energy Control Training“ shall include material on how the mass of locks and/or chains may impair seismic design features of components.[S/RID 19]

5.6 Portable Equipment and Vehicle Maintenance (PECMC)

The PECMC organization that is performing the maintenance and servicing on the portable equipment or vehicles in the field that is NOT physically connected to or near a facility will be responsible for the development, installation and removal of lockouts in accordance with Manual 8Q, Procedure 32 and Manual Y10.10, Procedure 9-38023, *Control of Hazardous Energy when Performing Maintenance on PECMC Portable Equipment and Vehicles*.

In situations where the portable equipment or vehicle is located in a facility, positioned over a facility or physically connected to a facility during maintenance and servicing, the lockout will be developed and controlled by the affected facility. The installation and removal of the lockout may be coordinated with the responsible organization performing the work whose supervisors and/or workers are trained and knowledgeable on the portable equipment or vehicle.

For portable equipment and vehicles serviced and maintained by the PECMC organization, Manual Y10.10, Procedure 9- 38023 outlines the responsibilities, record keeping, and training for implementing the HEC requirements defined in this procedure. Any changes or revisions to the PECMC procedure will require Health and Safety Management approval.

6.0 REFERENCES

1B, *Management Requirements and Procedures*

1B, 3.31, *Records Management*

1B, 3.32, *Document Control*

1B, 4.23, *Corrective Action Program*

2S, *Conduct of Operations Manual*

2S, 1.1, *Procedure Administration*

2S, 5.7, *Verification Methodologies*

2S, 5.9, *Hazardous Energy Control*

4B, *Training and Qualification Program Manual*

8Q, *Employee Safety Manual*

8Q, 9, *Barricades*

8Q, 36, *Process System Access*

8Q, 33*, Confined Space Entry Program*

10 Code of Federal Regulations (CFR) 851, *Worker Safety and Health Program*

18Q, *Safe Electrical Practices and Procedures Manual*

29 CFR 1910.147, .269, .333 Occupational Safety and Health Administration (OSHA) - General Industry [S/RID 13]

29 CFR 1926, OSHA, - Construction, SUB PART K [S/RID 13]

DOE-STD-1030-96, DOE Guide To Good Practices For Lockouts And Tagouts

E7, *Conduct of Engineering*

NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces [S/RID 14, 20, 23]

[S/RID 1] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)1

[S/RID 2] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)2

[S/RID 3] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)3

[S/RID 4] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)4

[S/RID 5] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)5

[S/RID 6] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)6

[S/RID 7] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)7

[S/RID 8] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)8

[S/RID 9] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)9

[S/RID 10] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)10

[S/RID 11] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)11

[S/RID 12] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(a)12

6.0 REFERENCES, (cont.)

[S/RID 13] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(b)

[S/RID 14] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(c)

[S/RID 15] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(d)1

[S/RID 16] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(d)2

[S/RID 17] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(e)1

[S/RID 18] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(e)2

[S/RID 19] DOE O422.1, Attachment 2, Paragraph 2.i.(1)(e)3

[S/RID 20] 10 CFR 851, App. A. 10

[S/RID 21] 10 CFR 851.25(a)

[S/RID 22] 10 CFR 851.25(b)

[S/RID 23] 10 CFR 851.23(a)(14)

[S/RID 24] 10 CFR 851, App. A. 4

Y10.10, Procedure 9-38023, *Control of Hazardous Energy when Performing Maintenance on PECMC Portable Equipment and Vehicles*

6.1 Guidance Documents

SRS Approved Lockout Devices
http://shrine01.srs.gov/eshqa/eshqa/safety/references/hazardousenergy/lockout_devices.pdf

SRS Approved Protective Measure Devices
http://shrine01.srs.gov/eshqa/eshqa/safety/references/hazardousenergy/Approved%20APM%20Devices.PDF

HEC Applicability to Portable Equipment and Vehicles
http://shrine01.srs.gov/eshqa/eshqa/safety/references/HEC_for_Portable_Equip%20_%20Vehicles.PDF

Guidance for Isolating Batteries When Performing Battery Work
http://shrine01.srs.gov/eshqa/eshqa/safety/references/hazardousenergy/Guidance-for-Isolating-Batteries.PDF

ERBM 2006-01 - Guidance for Working with Common Neutral Circuit
http://serb.srs.gov/pdfs/ERBM%202006-01%20REV%201.pdf

6.2 Tags, Labels and Signs

OSR 7-200A Tag: *Warning No Entry Without Permission*

OSR 18-49A Tag: *Warning for Electrical Grounding Tag*

OSR 20-154 Tag: *DANGER - Hazardous Energy Control*

OSR 20-155 Label: *DANGER - Hazardous Energy Control - Do Not Operate* (adhesive)

OSR 20-156 Label: *Lockout*

OSR 18-128 Label: Warning - *Spurious Voltage Jumper*

7.0 RECORDS

Records generated as a result of implementing this procedure are maintained in accordance with Manual 1B, Procedure 3.31, *Records Management*.

The following records generated by this procedure are retained for the specified time:

Maintain the L/T Log(s) for one year after completion per DOE O 243.1B. Then disposition per departmental records retention and disposal requirements.

Maintain all other forms, excluding Tags, for one year after completion of the work per DOE O 243.1B.

7.1 Forms

OSR 7-941 *Lockout Request Form*

OSR 20-143 *Lockout/Tagout Order*

OSR 20-146 *Electrical Grounding*

OSR 20-147 *Lockout/Tagout Log*

OSR 20-177 *Single Point Lockout/Tagout (SPLT) Log*

OSR 20-201 *Lockout Process Exemption Determination Flowchart*

8.0 ATTACHMENTS

Attachment 8.1 Flowsheet

Attachment 8.2 Preparation, Installation and Removal of Documented L/Ts

Attachment 8.3 Single Point L/T (SPLT) [S/RID 4]

Attachment 8.4 L/T Revisions [S/RID 13]

Attachment 8.5 Grounding

Attachment 8.6 Multi-Facility L/T

Attachment 8.7 Preparer's Guide

ATTACHMENT 8.1
Flowsheet
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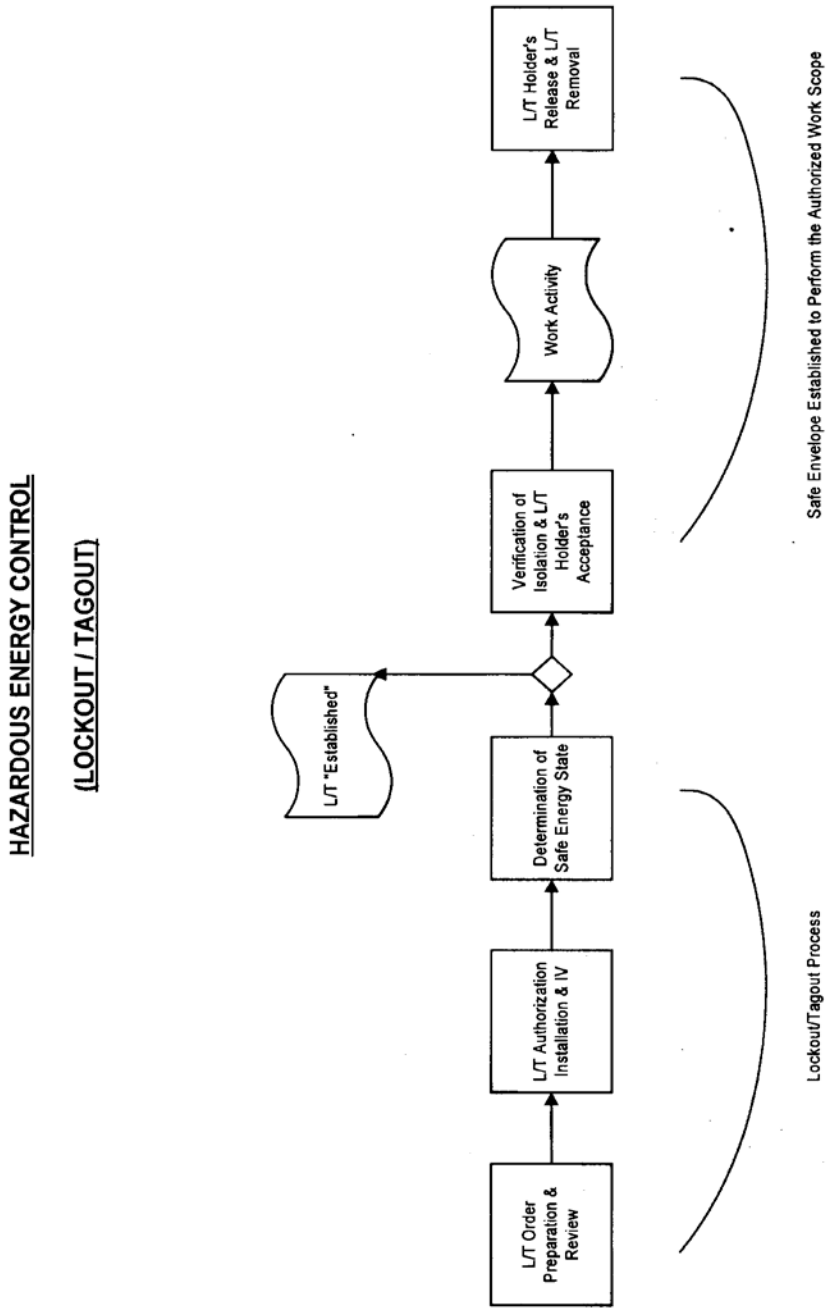

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! WARNING !

Operation of equipment protected by a DNO tag or unauthorized alteration or removal of DNO-Tags or locks is prohibited. Willful violation of this provision will result in disciplinary action, up to and including termination. [S/RID 10]

A. L/T Request (OSR 7-941)

Initiate a L/T by completing a L/T Request Form. A L/T Request may be used by the requesting work group(s) to assist operations personnel in determining the boundary for a L/T. This form is intended as a planning tool and is not required to process a L/T.

B. L/T Order Preparation

Preparer

1. Review established L/T Orders and determine if a new L/T Order or Revision is needed. .

2. Use Attachment 8.7. (*Preparer's Guide*), in addition to this procedure to plan, develop and review the L/T Order.

3. Refer to Attachments 8.4., 8.5., and 8.6., respectively when planning L/T Revisions, Grounding and Multi-Facility L/Ts.

4. L/T Preparers shall not perform the reviewer function, unless approved by the Facility Manager.

C. L/T Review

Operations Reviewer

1. Determine the required reviewers based on the scope of work and systems being affected by the L/T. Specify on the L/T Order block titled, "Review", those departments required to review the L/T.

   A. Ensure the L/T boundaries are adequate for the work to be performed safely.

   B. Ensure routing includes additional reviewers as required to validate boundary adequacy.

   C. Mark N/A for those departments not required to review the L/T.

   D. Review the tags to ensure they match L/T Order.

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Engineering Reviewers

Engineering reviews are required for documented electrical L/Ts to ensure safe boundary identification. This review may be delegated to an electrical system Subject Matter Expert.

All Reviewers

The cognizant manager of each reviewing department or their designee (e.g., Operations, Maintenance, Construction, Engineering, E&I, etc.) reviews and sign the L/T Order ensuring adequacy of the lockout versus their respective scope of work. Support groups who may be L/T Support Holders, (e.g., RP, IH, Quality Inspectors, etc.) are not required to review the L/T Order during the L/T preparation.

Reviewers are to perform their own independent review of boundary points and documents. It is allowable to discuss information with the L/T Preparer or other reviewers but do not solely rely on the information provided by them.

D. Preparation for Shutdown

Shift Manager

Prepare the component/system for shutdown.

E. System or Equipment Shutdown

Shift Manager

Direct shut down of equipment or system(s) in an orderly manner to avoid any additional hazards to personnel.

F. System/Equipment Isolation and Tagging

Shift Manager

1. Ensure facility conditions will support the proposed equipment and system alignments.
2. Ensure L/T does not conflict with existing L/T boundaries.
3. Ensure the L/T has been properly reviewed and at least two different L/T reviewers (e.g., minimum of Operations and Work Groups) are involved in the preparation/review/authorization process.
4. When ready to install the L/T, sign the block titled, "Shift Manager Authorization to Install L/T" on the L/T Order. **This signature shall not be delegated**.

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5. Notify the Work Group(s) the L/T is ready to be installed. In response to the Shift Manager's notification, the Work Group may witness component positioning and/or L/T verification during installation.

L/T Installer

! WARNING !

Do not attempt to manipulate a component controlled under an established L/T. Conduct Independent Verification using Procedure Manual 2S techniques.

NOTE

Component identification used on the DNO-Tag and L/T Order must uniquely identify the component. Additional information found on the component label is not required to be included on the DNO-Tag or L/T Order.

6. Perform the following for each L/T point, except the L/T lockbox point, per the L/T Order:

   A. Ensure the following:

      1) Tag number(s) on the L/T Order and the DNO-Tag(s) are the same.

      2) Component identification information used on the DNO-Tag and the L/T Order shall uniquely identify the component. If the identification used is inadequate to uniquely identify the component, STOP and notify the Shift Manager. If the component is not identified, STOP, notify the Shift Manager and request a temporary identifier be placed on the component.

   B. Position, or verify the position of, the components per L/T Order. The Installer can witness the positioning and placement of the DNO tag in locations where conditions preclude the L/T Installer from entering. [S/RID 9]

      1) When the component is already DNO tagged, verify the position of the component is the same required position as the DNO-Tag being installed. If the position is different, STOP, and notify the Shift Manager. [S/RID 4]

      2) When possible, verify the position is correct using visual or other means.

      3) When locks cannot be utilized, see "Additional Protective Measures".

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NOTE

1. When installing tags on components, which will be secured with manufactured lockout devices, ensure the tag is placed on the component such that it will not interfere with the installation of the device during the locking/verification phase of the lockout.

2. The items in Step C., below, can be performed without regard to sequencing.

C. Document installation activities by performing the following:

1) Sign and attach the DNO-Tag securely to the component in a clearly visible location so the DNO-Tag does not interfere with or obscure indicators, switches, labels or other control devices. If witnessing is used for the placement of the tag, the installer signs the tag prior to installation.

2) Initial the L/T Order in the "Installed By".

3) Place initials and printed name in the L/T Order block titled, "Initials and printed name of person(s) who initialed L/T Order", (first time only).

4) When Independent Verification is not required, perform actions as identified in Section “Independent Verification Not Required”.

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L/T Verifier

! WARNING !

Do not attempt to manipulate a component controlled under an established L/T. Conduct Independent Verification using Procedure Manual 2S techniques.

NOTE

1. For verifying components located in a controlled atmosphere, where component manipulations are performed in glovebags, glovebox and shielded cell, the Verifier does not sign the DNO-Tag. Verification activity is documented in the L/T Order.
2. Individual steps within F.7.A., F.7.B., and F.7.C respectively, can be performed in any sequence.
3. Chains, hasps, and manufactured items such as doughnuts are to be secured with a lock during this phase of the L/T.

7. Perform the following independent verification for each L/T point in accordance with the L/T Order.

   A. Locate the component and verify:

      1) The actual position of the component is the required position. If the position is different, STOP, and notify the Shift Manager.

      2) Tag number on the L/T Order and the DNO-Tag are the same.

      3) Component identification information used on the DNO-Tag and the L/T Order shall uniquely identify the component. If the identification used is inadequate to uniquely identify the component, STOP and notify the Shift Manager. If the component is not identified, STOP, notify the Shift Manager.

   B. Secure verification points by performing the following:

      1) Install lock (do not use excessive force when applying locks to components) so the L/T point is held in the required position, or when locks are not utilized, see "Exceptions and Clarifications" (Additional Protective Measures). [S/RID 4]

      2) Enter the key numbers in the associated block titled "Key Number (optional)" on the L/T Order

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3) Sign the "Verified By" block on the DNO-Tag.

4) Initial the L/T Order in the "Installation Verified By" column, as required.

5) Place initials and printed name in the L/T Order block titled, "Initials and printed name of person(s) who initialed L/T Order", (first time only).

6) Ensure all L/T keys are deposited in the lockbox. If only APM's are used and there are no locks or keys, no lockbox is required. Return L/T Order to the Shift Manager.

C. Secure the L/T lockbox when used and document actions by performing the following:

1) Install DNO-Tag and lock on the lockbox.

2) Sign the DNO-Tag in the "Installed By" block

3) Initial the L/T Order in the "Installed By" column

4) Enter the key numbers in the associated block titled "Key Number (optional)" on the L/T Order.

8. Return the L/T Order, L/T lockbox, and keys to the Shift Manager (except when inside an RBA, return the L/T Order only).

Shift Manager

NOTE

Steps F.9.A. through F.9.C respectively, can be performed in any sequence.

9. Shift Manager shall perform the following:

A. Verify the lockbox L/T point and sign the DNO-Tag in the "Verified By' block.

B. Initial the L/T Order in the "Installation Verified By" column.

C. Place initial and printed name in L/T Order block titled, "Initials and printed name of person(s) who initialed L/T Order", (first time only).

D. Ensure key to the lockbox is controlled. [S/RID15, 16]

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G. Determination of Safe Energy State

L/T Determiner (May be Initial L/T Holder)

! WARNING !

Do not attempt to manipulate a component controlled under an established L/T. Utilize Independent Verification using Manual 2S techniques during the determination of safe energy state process.

NOTE

The following applies to documented L/Ts as well as SPLTs:

1. The voltage tests associated with the determination of a safe energy state need to be performed at the work location. If this is not possible, the voltage test needs to be as close to the work location as practical. Voltage tests at the L/T boundary are the least desirable location.
2. The voltage tests associated with the determination of a Safe Energy State must be performed by a qualified electrical worker, knowledgeable of the job scope, and will be at least as thorough as the pre-work voltage test. Voltage on the points to be worked and in proximity need to be addressed.
3. If adjustments are required to allow a voltage test close to the work location (e.g., adjusting heat trace thermostat), contact Operations for assistance.

The following may be performed in conjunction with the L/T Installation-Process.

1. Determination of a Safe Energy State is by performing the actions in following sequence based on type of work: [S/RID 14, 20, 23]

   A. Electrical Work (work on or near exposed electrical conductors)

      1) Walking down the L/T points in the field to visually verify that the boundary point(s) are positioned as specified by the L/T Order or as identified on the SPLT DNO tag.

      2) Performing an absence of voltage test for electrical equipment (<50 volts potential as close as possible to the work location),

      3) When possible, verifying source switch blades are open or

      4) Using other approved methods such as circuit breakers being fully withdrawn and disconnected.

      5) When the electrical work involves lifting or opening neutral wires (e.g. common neutrals), perform a current test. If current is present, **STOP** and notify the Shift Manager. See ERBM in “Guidance Documents” for more detail.

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6) When working on batteries, the most significant hazard potential when isolating for maintenance and servicing is to ensure no current flow. A safe energy state is achieved by a visual inspection of switch blades or performing current test.

The following applies to 600 volt systems and below. There is no spurious voltage testing method recommended for systems above 600 volts:

1) If voltage of 50 volts or more is found and is suspected to be spurious voltage, refer to Manual 18Q, Procedure 2, Note E4 for the definition and testing process of spurious voltages.

2) If spurious voltage is determined using the 18Q-2 methods, the Shift Manager shall:

a) Add instruction(s) in the L/T Order to install jumpers to eliminate the spurious voltage for determination of safe energy. Include steps for:

- Work Group Supervisor acceptance of spurious voltage testing to initiate jumper and tag installation
- Shift Manager authorization to install jumpers and labels (OSR 18-128)
- Work group installs spurious voltage of jumpers and labels (label # and location)
- Shift Manager verification of jumpers/labels installation.

b) Add instruction(s) in the L/T Order to remove the jumpers when L/T is released by all Holders. Include steps for:

- Shift Manager authorization to remove jumpers and labels
- Work group supervisor acceptance of spurious voltage jumpers removed
- Shift Manager verification of jumper/ labels removal.

d) If the spurious voltage is found after the lockout has been established, notify the Shift Manager to add instructions in L/T Order to install and remove jumpers in accordance with Steps 2a and 2b. The addition of spurious voltage jumpers to a lockout does not require additional reviewers/approvers since the lockout boundary points do not change.

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B. Overhead Electrical Line Work

1) Walking down the L/T points in the field to visually verify that the boundary point(s) are positioned as specified by the L/T Order or as identified on the SPLT DNO tag

2) Verifying air gap exists at the disconnecting device (fuse holder, aerial switch, etc.).

C. Mechanical Work (work on valves, piping, machinery, etc.) [S/RID 13]

1) Walking down the L/T points in the field to visually verify that the boundary point(s) are positioned as specified by the L/T Order or as identified on the SPLT DNO tag.

2) Verifying that the work location within the boundary is depressurized, vented and/or drained as applicable, and that blocking devices are installed appropriate.

D. Mechanical Work with electrically driven equipment [S/RID 13, 14, 20, 23,]

1) Walking down the L/T points in the field to visually verify that the boundary point(s) are positioned as specified by the L/T Order or as identified on the SPLT DNO tag.

2) Verifying that the work location within the boundary is depressurized, vented and/or drained as applicable, and that blocking devices are installed as appropriate.

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NOTE

If voltage is found and determined to be spurious using 18Q-2 methods, the spurious voltage does not have to be eliminated for the mechanical work to proceed.

3) Performing one of the following methods for determining the isolation of the electrical equipment for mechanical work:

a) Performing a voltage test on the disconnecting device (e.g., breaker, disconnect switch, etc.) that feeds the motor by a qualified electrical worker. Control voltages that may be associated with the disconnecting device do not require testing.

b) Verifying air gap exists at the disconnecting device (switch knife blades open, etc.) by a Specific Task Worker (STW) or higher, or

c) **Only for SPLT's;** allowing the operation of the normal local control device.(e.g., pushbutton, switch, etc.).

4) Specifying for "Mechanical Work Only "in the L/T Order or on the SPLT DNO tag.

2. Documentation of Safe Energy State Performed

A. Initialing the L/T Order block titled, "Determination of Safe Energy State (Initials)".

B. Placing initials and printed name in L/T Order block titled, "Initials and printed name of person(s) who initialed L/T Order", (first time only).

Shift Manager

3. Ensure a "Safe Energy State" is established by:

A. Reviewing the L/T Order and ensuring that all potentially hazardous stored or residual energy has been relieved, disconnected, restrained, or otherwise rendered safe.

NOTE

If vents cannot be locked open due to possible hazard to environment, ensure IH and/or Area Safety has given direction and approved the L/T Order.

B. Where venting is required, ensure atmospheric vents and drains are DNO-Tagged OPEN and locked to prevent the possibility of re-accumulation of stored energy to hazardous energy levels.

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Preparation, Installation and Removal of Documented L/Ts
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H. L/T "Established"

Shift Manager

1. Verify steps in determining a Safe Energy State are completed and then sign the L/T Order in the block titled, "Shift Manager (L/T Established**)". This signature shall not be delegated**.

2. Update area L/T Log and place the L/T Order in a central location. [S/RID 5]

I. Verification of Isolation [S/RID 4]

NOTE

Support personnel signing on as a L/T Support Holder are not required to conduct "Verification of Isolation". Contact the Shift Manager with any questions about the L/T boundaries. L/T Support Holder personnel must sign onto the lockout in Steps 3 and 4 below.

Shift Manager

If grounding is required by the L/T Order, notify the group responsible for grounding and proceed to Attachment 8.5., *Grounding*.

1. Notify the L/T Holder(s) to perform the verification of isolation.

L/T Holder

! WARNING !

Do not attempt to manipulate a component controlled under an established L/T.

If the L/T Holder has any questions about the L/T boundary or safety provided by the L/T, STOP and contact the Shift Manager to resolve.

2. As a minimum, review the L/T Order for completeness.

   A. Additional actions to verify isolation may include the following:

      1) Walkdown the L/T points ensuring each point is locked and tagged per directions in the L/T Order.

ATTACHMENT 8.2
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2) For electrical work (work on or near exposed electrical conductors) or work on electrically driven equipment; ensure qualified personnel have conducted a voltage test, inspected switch blades, or used other approved methods.

3) For mechanical work (work on valves, piping, machinery, etc.); ensure that the work area within the boundary is depressurized, vented (Vent path components tagged and Locked open when possible), and/or drained as applicable and that blocking/braking devices are installed as appropriate.

3. Sign the block titled "L/T Holders Acceptance".

4. A L/T Holder may place a lock with label on the lockbox at this time. A worker has the right to install their labeled lock on the lockbox and witness component positioning and/or verification during L/T installation.

J. L/T Release [S/RID 11, 12]

L/T Holder(s)

1. Verify work is complete and inform all work group members the L/T is being released.

2. If grounds removal is required:

   A. All L/T Holders release the L/T.

   B. The grounding group representative performs actions as directed by Attachment 8.5.

3. Remove individual locks if installed, from the lockbox.

4. Sign the L/T Order block titled, "Lockout/Tagout Holder's Signature for Release", releasing the L/T.

5. Notify the Shift Manager the L/T has been released.

ATTACHMENT 8.2
Preparation, Installation and Removal of Documented L/Ts
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K. L/T Removal

Shift Manager

1. Verify ALL L/T Holders have released the L/T. [S/RID 11]

2. Verify the system/component(s) is operationally intact. Inspect the area to ensure all nonessential items have been removed. [S/RID 7]

3. Based on current facility status, determine the restored positions for the components on the L/T Order; positioning sequence; and any additional instructions that may be required for removing the L/T. Write this information in the "Removal Sequence" and the "Restored Position" columns of the L/T Order. If sequencing is not required, N/A the corresponding block(s). [S/RID 7]

4. Determine which L/T points require independent verifications; for L/T points that do not require independent verification, N/A the corresponding block(s).

5. Verify that components inside the L/T boundary, which may have been manipulated, are restored to the required position.

6. Verify that all personnel have been positioned safely or removed from the area.

7. Authorize L/T removal by signing the block titled, "Shift Manager Authorization to Remove L/T". **This signature shall not be delegated.**

8. Perform notifications as required by the L/T Order.

L/T Remover

! WARNING !

If the component has additional DNO-Tags or locks and the proposed restored position is different from the DNO-Tags remaining on the component, STOP, and notify the Shift Manager.

NOTE

Individual steps K.9.A., K.9.B, K.9.C, and K.9.D respectively, can be performed in any sequence.

9. Perform the following for each L/T point per the L/T Order:

   A. Remove the DNO-Tag, attachment device and lock (as applicable) from the component.

ATTACHMENT 8.2
Preparation, Installation and Removal of Documented L/Ts
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B. Position the component in accordance with the L/T Order.

C. Initial the L/T Order column titled, "Removed By" as required.

D. Place initial and printed name in L/T Order block titled, "Initials and printed name of person(s) who initialed L/T Order", (first time only).

E. Account for and destroy the DNO-Tags

F. Return the L/T Order to the Shift Manager

L/T Verifier

NOTE

Individual steps K.10.A, K.10.B, and K.10.C respectively, can be performed in any sequence.

10. Perform the following independent verification for each L/T point in accordance with the L/T Order:

A. Verify the component has been positioned to the required position.

B. Initial in L/T Order block titled, "Removal Verified By", as required.

C. Place initial and printed name in L/T Order block titled, "Initials and printed name of person(s) who initialed L/T Order", (first time only).

11. Return the L/T Order to the Shift Manager.

Shift Manager

NOTE

Individual Steps K.12.A, K.12.B, and K.12.C respectively, can be performed in any sequence.

12. Perform the following:

A. Review the L/T Order for completeness.

B. Sign the block titled, "L/T Removal Complete", signifying the L/T removal is complete.

C. Update the L/T Log.

ATTACHMENT 8.3
Single Point L/T (SPLT)
Page 1 of 4

! WARNING !

The L/T Worker Holder is directly responsible for installing, controlling and removing his/her DNO Tag and lock. The L/T Worker Holder shall not transfer the custody of their key to anyone at any time.

NOTE

1. The use of a SPLT shall be fully evaluated and agreed upon by the Work Group Supervisor and the Shift Manager.
2. For a SPLT installed to accommodate subcontractor work, facility operations/maintenance /custodian personnel as authorized by the SOM, shall position the component and then observe installation of the SPLT lock/tag by subcontract personnel.
3. For non-process related equipment only, the Shift Manager or equivalent authority may elect to allow subcontractor personnel to manipulate the component under the direction of the STR responsible for the subcontract. When this option is allowed, the STR must be present for the initial installation and establishment of the SPLT. If subsequent manipulations of the same component are required under the same SPLT, the subcontractor may be allowed to position the component without the STR being present to complete the authorized work activity.

A. Limitations

The SPLT bypasses several of the safeguards of a Documented L/T; therefore, the following limitations apply when utilizing a SPLT:

1. The length of time that the SPLT is in place in the facility should be minimized.

2. SPLT use is permissible ONLY in situations where it is clearly safe to use AND when the Work Group Supervisor has determined that ALL the conditions below are met. [S/RID 13]

   A. The machine or equipment has no potential for stored or residual energy, or re-accumulation of stored energy after shutdown, which could endanger employees. When working on batteries, a safe energy state is achieved by a visual inspection of switch blades or performing current test. See “Guidance Documents” for more detail on isolating batteries.

   B. The machine or equipment has a single energy source, which can be readily identified and isolated.

ATTACHMENT 8.3
Single Point L/T (SPLT)
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C. The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment.

D. The machine or equipment will be isolated from that energy source and locked out by the proposed SPLT during servicing or maintenance.

E. A single L/T device will achieve a tagged/locked-out condition.

F. The L/T device will be under the exclusive control of the L/T Worker Holder performing the servicing or maintenance.

G. The servicing or maintenance does not create hazards for other employees.

H. There have been no known accidents involving the unexpected activation or re-energization of the machine or equipment during previous servicing or maintenance.

NOTE

A SPLT may be utilized for work on electrical equipment, if the equipment is physically separated from other energized sources of power through permanent shielding. If multiple power sources (>50 volts) are found within the equipment enclosure where the work will be performed then use a Documented L/T.

3. SPLTs CANNOT be used for work in electrical equipment enclosures where multiple voltage sources >50 volts are, or can be, present.

4. SPLTs CANNOT be used for work when grounding of circuit(s) is required.

B. Activities

Work Group Representative

1. Request authorization from the Shift Manager to utilize the SPLT.

Shift Manager

2. Assign a sequential SPLT DNO-Tag number (i.e., SP-F/C-99-0001), for each individual worker, fill out the SPLT DNO-Tag with required information and update the Single Point Lockout/Tagout Log (OSR 20-177).

ATTACHMENT 8.3
Single Point L/T (SPLT)
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NOTE

1. The Shift Manager may authorize the L/T Worker Holder to position a component and hang a SPLT.
2. Items in steps B.3.A and B.3.B respectively, can be performed in any sequence. With completion of step B.3.C, the SPLT is “L/T Established.”
3. The SPLT Holder can install and remove the SPLT as needed to support the assigned task. The tag does not have to be re-signed with each installation.

SPLT Holder

3. Perform the following:

   A. Ensure the equipment to be worked on is in a Safe Energy State (see Attachment 8.2, *Determination of Safe Energy State*, for specific guidance).

   B. Each L/T Worker Holder ensures the correct position of the component, installs a DNO-Tag and locks the L/T point. If a lock cannot be applied, place the DNO-Tag on the component and, with the Shift Manager's approval, provide specified Additional Protective Measure (APM) per "Exceptions and Clarifications". The APM shall be specified on the SPLT Log.

   C. Each L/T Worker Holder signs the "Installed By" blank on the DNO-Tag, enters the date and ensures N/A is in the "Verified By" blank.

   D. When task is complete, each L/T Worker Holder removes their individual DNO-Tag, tag attachment device, and lock from the equipment.

   E. Account for and destroy the DNO-Tag.

   F. Notify the Shift Manager when the task is complete.

Shift Manager

4. Update the SPLT Log (OSR-177)

5. Ensure component position is restored properly.

ATTACHMENT 8.3
Single Point L/T (SPLT)
Page 4 of 4

C. Transfer of Work

1. Should the need arise for the **WORK** to be transferred to a different L/T Worker Holder (Worker) **THEN**:

   A. The on-coming L/T Worker Holder must place his/her Single Point Lock and DNO-Tag on the isolation point.

   B. The off-going L/T Worker Holder removes his/her Single Point Lock and DNO-Tag and notifies the Shift Manager.

   C. The Shift Manager updates the SPLT Log.

D. Single Point Lockout/Tagout Log Instructions (OSR 20-177)

1. The Shift Manager is responsible for ensuring the Single Point Lockout/Tagout Log is maintained current.

Block	Action
1.	Enter SPLT DNO tag number. The number consists of four parts: a preface-Area/facility-Year-Sequential number (e.g., SP-F/C-99-0001).
2.	Enter the name of the component number, description or unique identifier.
3.	Enter the work activity number (work package #, Procedure #, etc.). Only one number is required.
4.	Enter the name of the L/T holder for the SPLT DNO tag.
5.	Enter the date the SPLT DNO tag was issued and initial the SPLT Log.
6.	Specify the additional protective measure approved for use when a lock cannot be applied.
7.	Enter date SPLT is released and initial the SPLT Log.

ATTACHMENT 8.4
L/T Revisions [S/RID 13]
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NOTE

1. The installation and removal of a jumper for spurious voltages to a L/T is not considered a revision since the lockout boundary points do not change.
2. The installation and removal of grounds for worker protection to an established L/T is not considered a revision since the lockout boundary points do not change.

A revision is defined as ANY change to the boundary points of an established L/T. Revisions may be performed as necessary with the SAME disciplines' review and approval process as the original L/T Order. If additional disciplines beyond the original reviewers are affected by the revision, they also must approve the revision.

A. Limitations

1. An additional L/T Order Form (OSR 20-143) must be used to document the reviews and approval of the revised boundary points.

2. The approval of the Facility Manager MUST be obtained for the third revision and any revisions thereafter.

3. Revisions may be pre-approved with the original L/T Order.

4. A Temporary Modification (Temp Mod) may be required if a system will be operated in any configuration that is different from the design configuration, as required by Manual E7, *Conduct of Engineering*.

5. Revisions may be used to restore an operational function only when **ALL** the following are met:

   A. The safety of the worker(s) is not impacted (i.e., work is stopped) and,

   B. A Temporary Modification evaluation (Manual E7) is performed and,

   C. Appropriate Post Maintenance Testing is conducted for the restored equipment and,

   D. System status is maintained.

6. Once approved, a revision may be used as needed to support ongoing activities.

ATTACHMENT 8.4
L/T Revisions [S/RID 13]
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B. Activities

Preparer

1. Prepare written instructions for the L/T Revision.

Number revised L/T DNO-Tag(s) sequentially, counting from the last DNO-Tag number used in the original L/T or last revision, as applicable. Do not use alpha suffixes.

Reviewers

2. Review and approve the L/T Revision by signing L/T Order block titled, "Review".

Shift Manager

3. Review work in progress for potential impacts associated with performing the L/T Revision.

L/T Holder

4. Clear the work area before releasing the L/T Order.

5. Sign release of L/T Order. If required remove lock from the lockbox.

Shift Manager

6. Verify ALL L/T Holders have released the L/T per Attachment 8.2.

7. Verify all the required review signatures are obtained on the L/T Revision.

8. Verify system components are in a safe condition and ready for the L/T Revision.

9. Authorize the L/T Revision by signing the L/T Order in the block titled, "Shift Manager Authorization to Install L/T". **This signature shall not be delegated.**

LT Installer/Remover

10. Perform L/T Revision action steps per the L/T Order instructions in accordance with Attachment 8.2.

L/T Verifier

11. Perform Independent Verification steps per the L/T Order instructions in accordance with Attachment 8.2.

ATTACHMENT 8.4
L/T Revisions [S/RID 13]
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L/T Determiner

12. Determine that a Safe Energy State exists in accordance with Attachment 8.2.

Shift Manager

13. Ensure a Safe Energy State is established per Attachment.

14. Re-establish the L/T per Attachment 8.2.

15. Notify L/T Holders the L/T Revision has been established.

16. After reviewing the requested work activity to ensure the L/T adequately protects the worker, initial the L/T Order in the block titled, "Shift Manager Activity Approval".

L/T Holder

17. As each L/T Holder accepts the L/T Revision, their work may resume. Accept the L/T Revision by performing verification of isolation.

ATTACHMENT 8.5
Grounding
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Grounding is required for work on **ALL** electrical circuits greater than 600 volts and **may** be required on circuits 600 volts and less if so determined by the affected work group. Grounding is performed by qualified persons as defined in Procedure Manual 18Q. It involves placing personal grounds at locations, so arranged, that employees are prevented from being exposed to hazardous electrical differences of potential between conductive materials at the work location.

See Attachment 8.2 for spurious voltage jumpers.

A. Limitations

Grounds CANNOT be installed on Single Point L/T's.

B. Activities

Preparer

1. Provide steps in the L/T Order that:

   A. Direct the Shift Manager to request grounds be installed after establishment of the L/T.

   B. Direct the Shift Manager to verify ground(s) are installed per applicable ground sheet.

   C. Direct the Shift Manager to verify that grounds are removed per grounding sheet prior to authorizing removal of L/T.

Shift Manager

2. Authorize installation of grounding tag(s) and clusters by signing block 3, "Shift Manager Approves Application of Grounds (Signature)", of the Electrical Grounding form (OSR 20-146).

Grounding Work Group Supervisor (Installation of Grounds)

NOTE

Operations personnel or any group performing work under the L/T may observe the installations of grounds.

3. Approve the installation of grounds in accordance with Manual 18Q.

ATTACHMENT 8.5
Grounding
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4. Control the installation of grounds per the following steps.

   A. Sign Electrical Grounding form, OSR 20-146, to initiate grounding.

   B. Attach an electrical Warning-Grounding Tag to lockbox. If there is not a lockbox associated with the L/T due to the use of tags and Additional Protective Measures, then attach the tag to the L/T Order.

   C. Approve the installation of Warning-Grounding Tag on each grounding device.

   D. Approve the installation of the grounding device and document on the Electrical Grounding form.

   E. Return Electrical Grounding form to the Shift Manager to be attached to the L/T Order. In situations like utility services where grounds will be added/removed during the job, the Shift Manager is informed of the changes and the Electrical Grounding Form is retained in the field to document all grounding changes to support the work.

Shift Manager

5. Notify the applicable work group(s) to perform Verification of Isolation per Attachment 8.2.

Grounding Work Group Supervisor (Removal of Grounds)

6. Supervise removal of installed grounds and Warning-Grounding Tags, including witnessing steps.

   A. Ensure all L/T Holders have released the L/T.

   B. Sign Electrical Grounding form accepting L/T for removal of grounds.

   C. Remove the grounding device. Document on the Electrical Grounding form.

   D. Remove the Warning-Grounding Tags from the grounding device.

   E. Remove the Warning- Grounding Tag from L/T lockbox.

   F. Account for and destroy all Warning-Grounding Tags.

   G. Return the Electrical Grounding form to the Shift Manager.

ATTACHMENT 8.5
Grounding
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C. Electrical Grounding Instruction (OSR 20-146)

NOTE

When the form does not provide enough room/lines, the use of another sheet is proper. N/A those portions of additional sheets not used. All pages will have L/T numbers and L/T Revision numbers (if applicable). All pages will be numbered sequentially for each attachment.

Block	Action
1.	Preparer enters number of L/T.
2.	Preparer enters sequential page number.
3.	Shift Manager signs authorization to apply grounds.
4.	Grounding Work Group Supervisor enters signature and date initiating grounding.
5.	Grounding Work Group supervisor enters signature when the Warning-Grounding Tag is installed on the lockbox. Attach the tag to the L/T Order if there is no lockbox for the tag only L/T.
6.	Record location, installed by and witnessed by.
	Return the Electrical Grounding Form(s) to the Shift Manager if no changes to the grounds are needed to support the progress of the work. Shift Manager notifies Grounding Work Group Supervisor to remove grounding device(s).
7.	Grounding Work Group Supervisor enters signature and date for accepting the L/T for Grounding removal.
8.	Record removed by and witnessed by.
9.	Sign for Grounding tags removed from L/T lockbox.
	Return Electrical Grounding Form(s) to the Shift Manager.

ATTACHMENT 8.6
Multi-Facility L/T
Page 1 of 4

A Multi-Facility L/T is utilized when a Shift Manager performing work in the originating facility requires L/T point(s) established in a supporting facility to place subject equipment in a Safe Energy State.

A. Limitations

Originating facility can lockout/tagout equipment in the supporting facility only when BOTH facilities agree.

B. Activities

For the Shift Manager and L/T Operator, the following activities are in addition to the normal activities prescribed for a routine documented L/T listed in Attachment 8.2. The L/T Determiner and L/T Holder(s) will perform all required actions per Attachment 8.2.

Shift Manager (originating facility)

1. The originating facility provides the supporting facility with a scope of work needed by the originating facility and requests the supporting facility to complete the supporting L/T.

Shift Manager (supporting facility)

2. Prepare the L/T as requested by the originating facility.

3. Ensure the originating facility and appropriate workgroups review the supporting facility L/T.

Shift Manager (originating facility)

NOTE

The originating facility's Shift Manager or designee shall ensure that he/she is signed on the L/T Order of the supporting facility as a L/T Holder.

4. In preparing the L/T include as a L/T point the lockbox**,** or the individual component(s), of the supporting facility in the originating L/T Order.

Shift Manager (supporting facility)

5. The supporting facility Shift Manager will initial the block titled, "Shift Manager Activity Approval", of the supporting facility L/T Order when the L/T is established, documenting that the requested supporting facility L/T has met the scope requested by the originating facility.

ATTACHMENT 8.6
Multi-Facility L/T
Page 2 of 4

L/T Operator-Installer (originating facility)

6. Go to the supporting facility and:

   A. Perform the requirements of the originating facility L/T Order.

   B. Place a DNO-Tag on the applicable lockbox, or the individual component(s), of the supporting facility and sign the DNO tag(s).

   C. Initial L/T Order block titled, "Installed By", of the originating facility L/T Order.

L/T Operator-Verifier (originating facility)

7. Go to the supporting facility and:

   A. Install a lock on the applicable lockbox, or the individual component(s), of the supporting facility and sign the DNO-Tag

   B. Enter the key numbers in the associated block titled "Key Number (optional)" on the originating facility L/T Order.

   C. Initial L/T Order block titled, "Verified By", of the originating facility L/T Order.

L/T Determiner (May be Initial L/T Holder)

! WARNING !

Do not attempt to manipulate a component controlled under an established L/T. Conduct Independent Verification using Manual 2S techniques.

NOTE

The following may be performed in conjunction with the L/T Installation-Process.

8. Perform “Determination of Safe Energy State “outlined in Attachment 8.2 for L/T Determiner.

ATTACHMENT 8.6
Multi-Facility L/T
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Shift Manager

9. Perform “Determination of Safe Energy State” outlined in Attachment 8.2 for Shift Manager.

10. Verify steps in determining a Safe Energy State are completed and then sign the L/T Order in the block titled, "Shift Manager (L/T Established**)". This signature shall not be delegated**.

11. Update area L/T Log and place the L/T Order in a central location.

Shift Manager

If grounding is required by the L/T Order, notify the group responsible for grounding and proceed to Attachment 8.5., "Grounding".

12. Notify the L/T Holder(s) to perform the verification of isolation.

L/T Holder

If the L/T Holder has any questions about the L/T boundary or safety provided by the L/T, STOP and contact the Shift Manager to resolve.

! WARNING !

Do not attempt to manipulate a component controlled under an established L/T.

13. As a minimum, review the L/T Order for completeness.

    A. Additional actions to verify isolation may include the following:

        1) Walkdown the L/T points ensuring each point is locked and tagged per directions in the L/T Order.

        2) For electrical work (work on or near exposed electrical conductors) or work on electrically driven equipment; ensure qualified personnel have conducted a voltage test, inspected switch blades, or used other approved methods.

        3) For mechanical work (work on valves, piping, machinery, etc.); ensure that the work area within the boundary is depressurized, vented (Vent path components tagged and Locked open when possible), and/or drained as applicable and that blocking/braking devices are installed as appropriate.

14. Sign the block titled "L/T Holders Acceptance".

15. A L/T Holder may place a lock with label on the lockbox at this time. A worker has the right to install their labeled lock on the lockbox in addition to their supervisors’, and has the right to witness component positioning and/or verification during L/T installation.

ATTACHMENT 8.6
Multi-Facility L/T
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L/T Holder

If the L/T Holder has any questions about the L/T boundary or safety provided by the L/T, STOP and contact the Shift Manager to resolve.

! WARNING !

Do not attempt to manipulate a component controlled under an established L/T.

16. As a minimum, review the L/T Order for completeness.

    B. Additional actions to verify isolation may include the following:

        1) Walkdown the L/T points ensuring each point is locked and tagged per directions in the L/T Order.

        2) For electrical work (work on or near exposed electrical conductors) or work on electrically driven equipment; ensure qualified personnel have conducted a voltage test, inspected switch blades, or used other approved methods.

        3) For mechanical work (work on valves, piping, machinery, etc.); ensure that the work area within the boundary is depressurized, vented (Vent path components tagged and Locked open when possible), and/or drained as applicable and that blocking/braking devices are installed as appropriate.

17. Sign the block titled "L/T Holders Acceptance".

18. A L/T Holder may place a lock with label on the lockbox at this time. A worker has the right to install their labeled lock on the lockbox in addition to their supervisors', and has the right to witness component positioning and/or verification during L/T installation.

L/T Holder(s)

19. Verify work is complete and inform all work group members the L/T is being released.

20. If ground removal is required, go to Attachment 8.5., "Grounding"; otherwise, continue.

21. Remove individual locks if installed, from the lockbox.

22. Sign the L/T Order block titled, "Lockout/Tagout Holder's Signature for Release", releasing the L/T.

23. Notify the Shift Manager the L/T has been released.

L/T Operator-Remover (originating facility)

24. Go to the supporting facility and:

    A. Release the L/T Order per instruction of originating facility Shift Manager.

ATTACHMENT 8.7
Preparer's Guide
Page 1 of 7

A. General Guidance

Use Manual 8Q, Procedure 32, and other controlled documents, when planning and developing the L/T Order. Determine the required L/T boundary necessary to achieve a safe energy state for the task(s) associated with the L/T. Select L/T points and provide instructional steps in the L/T Order as needed to ensure that:

1. Compensatory measures are established prior to installation of L/Ts involving radiation exposure, contamination, or confined space entry. If the Facility Manager determines to waive the Independent Verification requirement for L/T installation then add instructions in the L/T Order as outlined in "Independent Verification (IV) Not Required".
2. Applicable operational/surveillance requirements and limitations on stand-by equipment are addressed.
3. Safety, security, and fire protection requirements are included.
4. Instructions for proper disposal of drained fluids are provided.
5. Selected L/T points are chosen to minimize impact on other work activities.
6. Appropriate sequence steps and selected L/T points safely isolate the component. (Consider the re-accumulation of energy.) [S/RID 4]
7. Push buttons, control switches, relays, solenoids, and check valves (unless specifically designed to have both an isolation and check feature) are restricted from use as a Primary L/T point.
8. Use of DNO Tags without locks is permitted for primary L/T points with an approved Additional Protective Measure (APM). The APM must be specified in the L/T Order. For SPLTs, the APM is specified in the log.
9. Use of DNO Tags without locks is permitted for secondary L/T points without an Additional Protective Measure. Secondary L/T points by themselves do not provide adequate isolation unless they are designed to be isolated and can be checked.
10. The use of energy isolation devices on equipment that is only accessible by remote means (e.g., canyon areas, hot cells, etc.) and where a L/T device cannot be used is avoided. If a remotely accessible energy isolation device must be used in a special situation to prevent employee hazard exposure, then the Facility Manager must, with input from the Area Safety Engineer, develop and document a special L/T process to control the energy isolation device. This special L/T process shall be included in the documented facility specific information and be provided to Health and Safety for approval prior to use. [S/RID 13]

ATTACHMENT 8.7
Preparer's Guide
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11. When a DNO-Tag cannot be directly attached to a device, identify the closest possible point (to the energy-isolating device) at which the DNO-Tag can be attached. The DNO-Tag should be placed such that it is immediately obvious and serves to warn anyone prior to attempting to operate the device.

12. When walkdowns are required, the following apply:

    A. All L/T points except those located in High Radiation Areas, Airborne/Contamination Areas, or inaccessible areas (e.g., confined spaces, require scaffolding) shall be walked down. Use of L/T points in these areas without a walkdown requires the approval of Operations Management.

    B. L/T Revisions will require a walkdown of the revised L/T points unless the L/T points meet the above exceptions.

    C. During the walkdown the L/T Preparer shall verify component accessibility and confirm that equipment location and labeling are per controlled documents.

    D. If a discrepancy exists between the controlled document and the field, then the discrepancy must be resolved before the walkdown is considered completed.

    E. If labeling deficiencies (e.g., no label, label does not match, etc.) are found during the walkdown, then ensure the L/T Order matches the drawings. The field label shall be corrected or installed. This can either be a permanent tag, a temporary (2S) tag, or a lead label in the case of lifted leads.

13. A walkdown verification shall be performed by the preparer in the development of all new lockouts. Controlled documents will be used when available during the preparation of the lockout. For repetitive work, (e.g. weekly, monthly), the lockout boundaries will be re-verified by a walkdown, or review of the controlled documents before installation of the lockout. If the lockout is approved, but not yet installed, and greater than 45 days old, the lockout boundaries will be re-verified by a walkdown or review of the controlled documents before installation. Record the walkdown and all documents reviewed with latest revision date in the L/T Order block titled, "References".

14. Consideration is given to conducting voltage checks to verify the correct L/T points are being identified during the preparation of the L/T. Also, with permission from Shift Manager, consider performing operational checks on equipment to validate that the proper points have been selected. A suggested method would be to witness operation of equipment and/or system/equipment parameters and then witness a qualified operator stop the affected equipment and/or secure the operating system in accordance with approved procedures. Verify that the result is as anticipated; i.e., motor stops running.

15. Equipment interlocks are not relied upon as a means to provide energy isolation. However, when testing for positive isolation of energy and/or prevention of equipment start-up, the interlock function must be taken into account.

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16. Installation of physical blocking or restraint devices is directed to prevent windmilling, and/or, other component movement that could be hazardous to personnel. The device must be installed after the equipment is de-energized and before work has begun. The device must be DNO-Tagged and locked if possible, and listed on the L/T Order.

17. Component identification information of L/T points in the L/T Order and on the associated DNO-Tags is taken from the labeling of the component in the field and is adequate to uniquely identify the component lockout point. Additional information found on the component label that does not aid in uniquely identifying the component is not required to be included on the DNO-Tag or L/T Order.

18. The following standardized nomenclature is used in the L/T Order and on DNO-Tags when identifying a required position of an L/T point. When available, use the nomenclature as labeled on the component.

COMPONENT	POSITION
Breakers	OPEN/CLOSED, ON/OFF, RACKED OUT/RACKED IN, RACKED UP/RACKED DOWN
Disconnects	OPEN/CLOSED, ON/OFF
Switches	OFF/STOP, MANUAL/AUTO, STAND-BY/BY-PASS
Push Buttons (only as Secondary Lockout Point)	NO POSITION AVAILABLE (DO NOT OPERATE)
Fuses	REMOVED/INSTALLED PULLED/INSERTED
Leads	LIFTED/LANDED
Grounding Devices	INSTALLED/REMOVED
Valves	OPEN/CLOSED
Blank Flanges	INSTALLED/REMOVED, LOOSENED/TORQUED
Locking Pins	INSTALLED/REMOVED
Actuator Air Supply	VENTED

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B. Lockout of Electrical and Electrically Driven Equipment.

Develop L/T Order instructional steps, as needed to ensure that:

1. Circuits have been de-energized by inspection of switch blade positioning, removal of fuses and/or, test for less than 50 volts present at work area, per Manual 18Q.

2. Switchgear is racked out to disengage the main contacts from the bus when possible.

3. Power to motors and controls with multiple feeds have all control and auxiliary circuits de-energized.

4. DNO-Tags and locks (where possible) are visible and accessible without exposing personnel to energized parts.

5. Work on electrical systems greater than 600 volts is in compliance with the Grounding requirements of this procedure and Manual 18Q.

6. Automatic transfer switches are not a source of energy when working upstream of the transfer switch. An automatic transfer switch cannot be used as an isolation device if the work is to be performed downstream of the transfer switch. Therefore, automatic transfer switches will not be a part of the lockout.

7. Components are not locked in the energized state as to restrict components from being readily accessible in emergency or other unusual circumstances. (i.e., Electrical distribution panel doors shall not be locked for use as an energy-isolating device.)

8. Batteries are isolated by lifting battery leads and/or, opening the associated disconnect. When isolating batteries for battery work, an absence of voltage determination is not required or practical since voltage is always present. A safe energy state is achieved by a visual inspection of switch blades or performing current tests. See "Guidance Documents" for more detail on isolating batteries.

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C. Lockout of Vessels and Piping.

Develop L/T Order instructional steps, as needed to ensure that:

1. The equipment is isolated, de-pressurized, drained, purged, or otherwise made safe for work.

2. If confined space entry is required, safe isolation can be achieved by blanking or blinding, misaligning or removal of lines, piping or ducts, or double block and bleed (two in-line devices (e.g. valves) that are "closed " and a drain or vent line that is "open" between the devices). See Procedure Manual 8Q, Procedure 33 for additional guidance.

3. The isolation valves that shut off flow of material and isolate equipment are DNO-Tagged CLOSED, and locked.

> **NOTE**
>
> If material is hazardous to the environment, IH and/or Area Safety Engineer is consulted for guidance.

4. Atmospheric vents and drains are DNO-Tagged OPEN and locked to prevent the possibility of re-accumulation of stored energy to hazardous levels.

5. For isolation of systems that are at high pressure (>500 psi), high temperature (>200°F), or contain hazardous materials, two valve isolation is used. Facility Manager level approval, or in organizations other than operating facilities, an equivalent level manager, is required for the L/T when two-valve isolation is not used in this situation.

6. Vents located at the work area are re-directed prior to DNO-Tagging and locking the vent open. Barricades (roping off the area) are provided around vents that are located in personnel traffic areas.

7. Power-driven and/or, remotely operated valves used as isolation points, are verified to be in the correct position and then made inoperable. DNO-Tag and lock the valve operator (hand wheels, etc.) and power supply to the valves as needed.

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D. Lockout of Diaphragm Air Operated Valves.

Develop L/T Order instructional steps, as needed to ensure that:

1. When the use of diaphragm air operated valves for isolation purposes cannot be avoided, that specific approval from the Facility Manager is obtained for use of the selected diaphragm air operated valves as L/T points.

2. The following requirements are followed when a diaphragm air operated valve is required as a L/T energy isolation point (CLOSED position),

   A. If the valve is "Air to Open", then all air supplies to the valve are isolated and vented. Both the isolation valve and the vent valve are included as L/T points.

   B. If the valve is "Air to Close", then a mechanical gagging or blocking device is used to prevent operation. DNO-Tags and lock (where able) are installed on both the blocking device and associated valve.

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E Revision Guidance

1. Develop L/T Order instructional steps for revisions, as needed to ensure that:

   A. "Shift Manager's Authorization to Remove L/T" and "L/T Removal Complete" blocks are N/A'd on Page 1 of the previous revision.

   B. The revision number is placed in the "Revision No." block on Page 1 and subsequent pages of the revision.

   C. Instructional steps and L/T points are numbered with the next sequential numbers from the previous revision.

   D. Direction for the Shift Manager to approve the installation of the revision is provided.

   E. Steps are provided to remove the lock from the lockbox and to re-install the lockbox lock as part of the revision.

2. Points that are removed in previous revisions should be signed off in the body of the L/T Order as the points are removed.

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L/T Training Matrix
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L/T Functions	Initial Training		Refresher Training (Every 2 years)
Preparer (Writer) **Reviewer** **Shift Manager** **Installer/Remover** **Determiner** **Worker Holder** **Assessor**	TREGHEC0 and JPM (TREGHEOM)		TREGHECR and JPM (TREGHEOM)
Support Holder	TREGHEC2		TREGHEC2
Operations Manager	TREGHEC1		TREGHEC1