DOE-0336
Revision 1

Hanford Site Lockout/Tagout Procedure

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

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1.0 PURPOSE

The Hanford Site Lockout/Tagout Procedure, herein called the procedure, establishes the single process for the locking and tagging of equipment and systems to protect personnel from the unexpected release of hazardous energy or materials. In addition, this procedure provides a method for equipment and systems control to protect equipment from damage and maintain the integrity of physical boundaries.

Conformance to this procedure ensures that hazardous energy sources are properly isolated and controlled. This procedure shall provide consistent application of lockout/tagout requirements across work activities.

2.0 SCOPE

The use of this procedure prevents the unexpected start-up or release of stored energy that could result in injury or hazardous material exposure.

- This procedure shall be used whenever workers (contractors, subcontractors, vendors, service providers, etc.) are performing servicing or maintenance activities, including construction, on facility equipment or systems where there is any possibility of personnel injury as a result of an unexpected release of energy or hazardous materials.
- A contractor performing Greenfield Construction with no physical interface to an existing facility shall be designated as the controlling organization (CO) and required to follow the Hanford Site Lockout/Tagout Procedure in its entirety. This procedure shall be used to control potential hazardous energy to personnel when damaged equipment is removed from service and pending corrective maintenance.
- The “Danger” tag and associated lock shall be the only devices used by the Authorized Worker (AW) for controlling hazardous energy during servicing and maintenance activities and shall not be used for other purposes.
- This procedure may be used as a method for equipment and systems control to protect equipment from damage, prevent a potential inadvertent release to the environment, and maintain the integrity of physical boundaries.

Equipment is not to be operated when a “Danger-Do-Not-Operate” or “Danger” tag is attached to a component.

Some hazardous energy/material examples that should be controlled to avoid personnel exposure during service and maintenance are:

- Electrical
- Mechanical
- Hydraulic
- Pneumatic
- Chemical
- Radiation Generating Devices (RGD)
- Thermal energy
- Potential energy (springs, compressed gases, suspended objects)
- Potential release of hazardous material (contaminated fluids, etc.)

Activities relating to Electrical Utilities (EU) Operations are addressed per MSC-PRO-066, *Electrical Utilities Lock and Tag Program.* When performance of the work requires facility over locking/tagging of the EU Hold-Off Tag, apply a CO lockout/tagout that may be overlocked/tagged by the AW and that meets the requirements of this Procedure and MSC-PRO-066. When interfacing with work groups who do not use DOE-0336, the CO must coordinate the control of the isolation boundary with this procedure.

This procedure does ***not*** apply to the following:

- Work on cord-and-plug-connected electric equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.
- Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provided that the employer demonstrates that:
  - Continuity of service is essential;
  - Shutdown of the system is impractical; and
  - Documented procedures are followed, and special equipment is used which will provide proven effective protection for employees.
- Use of locks and/or tags for purposes of long-term equipment shutdown or deactivation (e.g., Administrative Lock Programs).
- Servicing of motor vehicles.
- Use of Caution Tags.
- Servicing, maintenance, adjustments, or minor tool changes which take place during normal production operation, if they are **routine**, **repetitive**, and **integral** to the use of the equipment and alternative protective measures are employed. In such cases, the employee is not permitted to remove or bypass a guard or other safety device, or place any part of the body within the point-of-operation or danger zone during an operating cycle.
  - Activities requiring machine or equipment shutoff and disassembly, such as changing a machine tool or cutting blade, replacement of belts, valves, gauges, linkages, support structure, etc., which take place outside of the normal production process DO NOT QUALIFY for this exception to lockout/tagout requirements.

3.0 IMPLEMENTATION

This procedure becomes effective September 15, 2011.

4.0 REQUIREMENTS

This procedure implements the lockout/tagout requirements of the *Worker Safety and Health Program and Conduct of Operations*.

5.0 PROCESS

This section establishes the process steps for performing lockout/tagout activities. The user may perform only those sections needed. Bullets are used for steps or sub-steps not requiring sequential performance.

5.1 Roles, Responsibilities, and General Administration Requirements

Only qualified personnel may perform lockout/tagout activities.

NOTE: *The Volpentest HAMMER Training and Education Center (HAMMER) "Lockout/Tagout Training Program Description" provides guidance for selecting applicable lockout/tagout training. This document can be accessed via the HAMMER/Hanford Training web page.*

A qualified member of the CO must be current in lock and tag training and be designated in writing by the responsible organization to perform the work. CO personnel who are assigned to establish safe work boundaries must be knowledgeable on the systems to which the boundaries are being established. Personnel performing and/or signing for Safe Condition Checks must be qualified as an AW, at a minimum.

To be qualified as an AW, the AW must be current in lock and tag training. To perform AW functions, the individual shall be familiar with facility processes and systems or be escorted by an AW that is.

Supervisors/Field Work Supervisors who oversee lockout/tagout activities shall be qualified as an AW, at a minimum.

NOTE: *For the tables in this section under the requirement "type" column, "RR" means roles and responsibilities, and "GR" means general requirements.*

Actionee	*Type*	*Roles and Responsibilities*
• Controlling Organization Administrator (COA)	• RR	• Responsible for all lockout/tagout functions to include: • Identify hazards that require the use of lockout/tagout. • Determine which method (CO or eight criteria) of lockout/tagout to use. • Assign, establish, and maintain isolation boundaries. • Prepare the Tagout Authorization Form (TAF) (A-6004-460). • Ensure that safe condition checks are performed. • Authorize the lockout/tagout to be installed. • Authorize removal of the CO lockout/tagout. • Oversee the lockout/tagout surveillance process, including establishing and documenting periodicity. • Provide lockout/tagout hardware and tags. • Notify affected worker(s) of impending lockout/tagout. • Identify and document CO personnel that may perform lockout/tagout for the facility.

Actionee	*Type*	*Roles and Responsibilities*
		• Ensure lockout/tagout authorization forms and eight criteria lockout/tagout forms are completed in accordance with this procedure. • Ensure a lockout/tagout brief is conducted before installation of lockout/tagouts. • Escort, or assign a knowledgeable AW to escort, personnel who are unfamiliar with the facility and/or systems.

COA Designated Escort	RR	• The escort ensures:
		  o Proper boundary walk down
		  o The correct placement of the AWs lock(s) and "Danger" tag(s)
		  o Proper performance of the AWs safe-to-work check
		  o The correct removal of the AWs lock(s) and "Danger" tag(s)
		• Escorts shall be a qualified AW, at a minimum.

Management	RR	• Ensure required training is maintained and documented. • Designate in writing the Lockout/Tagout Technical Authority. • Conduct periodic field reviews to ensure program effectiveness. • Conduct the annual assessment of the Procedure.
Hanford Site Lockout/Tagout Committee	RR	• Review and approve this procedure and any procedure changes, interpretations, clarification, or guidance. • Review and approve the lockout/tagout training.
Lockout/Tagout Technical Authority	RR	• Function as the company point-of-contact for implementation and interpretation of this program. • Interface with the Hanford Site Lockout/Tagout Committee.
CO Qualified Worker (COQW)	RR	• Install, verify, and remove COs lockout/tagout. • Perform or witness safe condition checks that are performed in support of COs lockout/tagout.

Actionee	*Type*	*Roles and Responsibilities*
Authorized Worker	RR	• Install only their own AW lock(s) and "Danger" tag(s) on the isolation device(s) and/or lockbox(s) for their own safety in accordance with this procedure. • Remove only their AW lock and "Danger" tag when it does not cause an unsafe condition. • Perform and/or sign Safe Condition Checks for CO. • Perform AW Safe-to-Work Checks. • Request a knowledgeable person as an escort when unfamiliar with a facility and/or system.
Supervisor/Field Work Supervisor	RR	• Ensure CO lockout/tagout installation is complete before AW lockout/tagout installation if applicable. • Coordinate the installation of AW locks and "Danger" tags. • Ensure AW lockout/tagout requirements are reevaluated if there is a change in the scope of work. • Coordinate the removal of AW locks and "Danger" tags. • Ensure that only qualified AWs are assigned to perform lockout/tagout. • Conduct briefs associated with lockout/tagout activities for the COA, as requested.

	Type	*General Administrative Requirements*
	GR	The person that signs for "prepared by" and the person that signs for "technical review" shall be two separate individuals.
	GR	An AW performing the work has the option to observe the initial shutdown of the system/equipment (e.g., loss of power). This does not preclude the requirement to perform a Safe-to-Work Check.
	GR	Hardware shall be durable, standardized, substantial and readily identifiable.

	GR	Locks:
		• AW locks shall:
		  o Be green
		  o Use individual "Danger" tag(s) issued for their exclusive use
		  o Have one key that is to remain under the exclusive control of the AW unless using Section 5.10.1 of this procedure
		• CO locks used with "Danger – Do Not Operate" (DDNO) tags shall:

Actionee	*Type*	*Roles and Responsibilities*
		o Be red o Be uniquely keyed o Have one key controlled by the CO • Colors of locks shall not be used for any other applications.
	GR	Lockboxes, where used, shall have clear covers.
	GR	Attachment of "DDNO" tags shall be by grommet and/or by an all-environment-tolerant nylon cable tie (See substantial hardware.)
	GR	Temporary lifting and reinstalling of "DDNO" tags is not allowed. Tags may only be used one time and must be destroyed once removed.
	GR	Do ***not*** authorize another person to ignore or violate this procedure.
	GR	Do ***not*** operate any device on which a lockout or tagout is installed.
	GR	Equipment with an attached lockout (s) or tagout(s) is ***not to be removed*** from the installed location.
	GR	Any changes made to a TAF or tag shall be done by a single line cross-out and initialing and dating the change. All technical changes shall be reviewed by a preparer and a technical reviewer.
	GR	If it is determined that the lock should be cut off, then the AW supervisor, or designee, and a person from the CO, shall be present (as a second check) to verify that it is the correct lock prior to cutting it off.
	GR	Do not use an AW lock in place of a CO lockout.

5.2 Write the Lockout/Tagout

Actionee	*Step*	*Action*
COA (Preparer)	1.	If the work control process identifies hazards that require the use of lockout/tagout, determine which of the following methods is to be used: • Use of a CO lockout/tagout using a TAF, ***or*** • Use of AW locks and tags alone when **all** of the **eight criteria** listed below are met. 1. The equipment has no potential for stored or residual energy or re-accumulation of stored energy after shutdown, which could endanger workers. 2. The equipment has a single energy source that can be readily identified and isolated. 3. The isolation and locking out of the energy source will completely de-energize and deactivate the equipment. 4. The equipment is isolated from the energy source and locked out during servicing or maintenance. 5. A single lockout device will achieve a locked out condition. 6. The lockout device is under the exclusive control of the AW performing the servicing or maintenance (key to the lockout device is in the possession of the AW). 7. The servicing or maintenance does not create hazards for other workers. 8. There has been no incident or deficiency involving the use of this exception for the machine or equipment pending correction or resolution by the responsible CO or contractor employer.
	2.	If the eight criteria method is selected, go to Section 5.9.
	3.	Identify the lockout/tagout boundary using any appropriate means necessary (e.g., approved drawings, engineering sketches, databases, documents, and/or a field walkdown). • Refer to Appendix C for hazardous energy isolation controls. • The facility specific identification on the label should match the

Actionee	Step	Action
		identification on the drawing. If it does not, then pursue the appropriate method to make them the same (e.g., install a temporary label, initiate a drawing change). If no drawing is available, use whatever means necessary to determine the correct identification with concurrence from the system subject matter expert.
		4. If a lock cannot be used, see Appendix B, Block #14 directions for examples of alternate methods.
		5. Prepare the TAF (A-6004-460). Appendix B contains TAF clarifications by block. **NOTE:** *Additional work packages may be added to a TAF after a lock and tag have been installed by referring to section 5.10.4.* • Block #1: Obtain the next sequential number from the Tagout Index (A-6000-514) and enter this number. The number shall also be entered on all additional pages and in the index. This step may be deferred to Step 5.3.1.a. The tagout number is not part of the technical review. • Block #2: Enter the page number. • Block #3: Enter the system name, number, or abbreviation. • Block #4: Enter the identification of all applicable control drawings, drawing change documents, and/or other methods used to establish isolation boundaries. • Block #5: Enter lockbox information as applicable. The lockbox information may be filled in at the time of installation. • Block #6: Enter work authorization(s), procedure number(s), or step number(s) that are pertinent to this lockout/tagout and consistent with the reason for tagging identified in TAF Block #8. • Block #7: Enter tag numbers applicable to the work authorization/procedure. • Block #8: Enter summary of work to be performed or the basis for the tags. • Block #9: List the personnel hazard(s) that require the lockout/tagout in TAF Block #9.

Actionee	*Step*	*Action*
		• Block #13: Enter the tag number(s) (e.g., 1, 2, 3, 4 -7). • Block #14: Enter any required special instructions. Mark "NA" for tags not requiring special instructions. • Block #17: Enter the tagout number. • Block #18: Enter the page number. • Block #19: Enter the sequential number of the tag (e.g., 1, 2, 3). • Block #20: Enter a clear, specific description that uniquely identifies each component to be tagged. • Block #21: Enter the location of the component. • Block #22: Enter the lock number, if a lock is required. The lock number may be filled in at the time of installation. Enter "N" in TAF Block #22 if a lock is not required. If a lock cannot be installed, an alternative method of equivalent protection is to be used. Enter equivalent method information in Block #14. • Block #23: Enter the required position/condition of the component. Use clear/concise terms that appear on the component indicator, when present. • Block #31: Enter the number(s) of the tag(s); (e.g., 1, 2, 3, 4-7). • Block #32: Enter instructions for Safe Condition Check. See Appendix D for guidance, as needed.
	6.	Prepare the "Danger--Do Not Operate" tags to be used. **The information on the tags shall match the information on the TAF.** See Appendix B for directions, if needed.
	7.	Sign and date TAF Block #10 to signify that the lockout/tagout boundary and paperwork are adequate and accurate for the task.

Actionee	*Step*	*Action*
COA (Tech Reviewer)	8.	Sign and date TAF Block #11 indicating completion of an independent technical review to verify the adequacy and accuracy of the lockout/tagout boundary and paperwork. • Use controlled drawings, engineering change notices (ECN), facility modification packages (FMP), approved sketches, field walk downs and other available documents and means to verify the adequacy of the lockout/tagout. • Review isolation boundaries and ensure that they are technically adequate and administratively accurate to effectively control hazardous energy. • Ensure that the TAF and tags are properly prepared and documented in accordance with this procedure.

5.3 Apply the Controlling Organization Lockout/Tagout

The TAF shall be in the possession of the person installing, verifying, performing Safe Condition Check or removing the tag(s). If conditions warrant, an up-to-date copy of the TAF may be used, provided the original is signed promptly after leaving the area.

The AW performing the work has the option to observe the initial shutdown of the system/equipment (e.g., loss of power). This does not preclude the requirement to perform a Safe-to-Work Check.

If discrepancies are found during field activities of the lockout/tagout process, stop work and notify the CO/Authorizer.

5.3.1 Installation of Lockout/Tagouts

Actionee	*Step*	*Action*
COA (Authorizer)	a.	Perform the following: • If not already completed, obtain the next sequential number from the tagout index and enter the number in TAF Block #1 and on any additional pages. • Ensure all information on TAF is complete and accurate.

Actionee	*Step*	*Action*
		• Review tag(s) for completeness. • Verify equipment/system conditions support the application of the lockout/tagout. • Authorize installation of the locks and tags by signing and dating TAF Block #24 and associated tags. • Ensure a lockout/tagout pre-installation brief is conducted with personnel performing installation, verification, and Safe Condition Checks. Include any special instructions, relevant hazards and controls, and performance of the Safe Condition Check. If necessary, individuals may be briefed separately prior to performance of their tasks. • Ensure affected personnel are notified of impending lockout/tagout.
COQW(Installer)	b.	Prepare to install the lock and tag. • Verify TAF and tag(s) are authorized for installation. • Ensure any special instructions from TAF Block #14 are met. • Ensure the correct component is in the specified position/condition per TAF Block #23. • If a lock and tag will prevent performing the safe condition check in Step 5.3.3, then perform the safe condition check(s) before installing the lock and maintain the safe condition until the lock and tag are installed.
	c.	Install the lock (if applicable) and tag: • Place lock on the correct component. • Ensure visually and physically (as long as another lockout/tagout is not installed) that the lockout device is adequately installed to prevent inadvertent operation of the component. • If lock number is not already assigned in Step 5.2.5 (5.10.4.5), record the lock number in block #22 on the TAF and tag. • Install, sign, and date the tag. Ensure that the tag is secure and any special instructions from TAF block #14 are met. The tag shall be placed on the component or as close as possible without interfering with other indications or controlling devices.
	d.	Sign and date the TAF in block #25.
	e.	Repeat Steps 5.3.1.b through 5.3.1.d as many times as necessary to install the specified lock(s) and tag(s).
COA/COQW	f.	Place key(s) under control (e.g., lockbox, key cabinet).

5.3.2. Independent Verification **of** CO Lockouts**/Tagouts**

The verification process is expected to be done independently, but may be performed concurrently if justified in block #14 of the TAF. The justification shall state why the verification cannot be done independently (e.g., removal of valve handles, fuses removed from a panel and the panel door locked shut).

If position cannot be determined, or if isolation/deenergization cannot otherwise be verified, work shall be stopped and the COA/Authorizer shall be notified.

Actionee	*Step*	*Action*
COA	a.	Assign a person other than the one that installed the tags.
COQW/Verifier	b.	Verify lock and tag as follows: • TAF and tag are authorized for installation. • The installation has been performed as directed by the TAF and the in-field information agrees with the TAF. • Tag information is complete. • TAF and tag have been signed by the installer. • Any special instructions from TAF Block #14 are met. • The ***correct*** component is tagged. • Position/condition of component is ***correct*** as defined by TAF Block #23. • Tag is secured. • Lock (if applicable) is secured on ***correct*** component. • Visually and physically (as long as another lockout/tagout is not installed), that the lockout device is adequately installed to prevent inadvertent operation of the component. • Lock number matches the number recorded in TAF Block #22, as applicable.
	c.	Sign/date the tag.
	d.	Sign and date the TAF Block #26.
	e.	Repeat Steps 5.3.2.b through 5.3.2.d as many times as necessary to verify the specified lock(s) and tag(s).
COA/COQW	f.	Verify key is controlled for each lock.

5.3.3. Perform Safe Condition Checks

Refer to Appendix D for guidelines for performing Safe Condition Checks.

Actionee	*Step*	*Action*
COA/COQW /AW	a.	Perform or witness Safe Condition Check per TAF Block #32. (The safe condition check may have already been performed per Step 5.3.1 and would not need to be completed again.) Ensure any special conditions for performing the safe condition check are met.
	b.	Sign and date the Safe Condition Check TAF Block #27 for each tag listed in TAF Block #19. **NOTE**: *Signing TAF Block #27 signifies that the safe condition check requirements in Block #32 have been met. Qualified AW performing the Safe Condition Check may sign for the performance of the Safe Condition Check.*
	c.	Repeat Steps 5.3.3.a and 5.3.3.b as many times as necessary to complete Safe Condition Checks.
COA	d.	Ensure the TAF is complete (tags have been installed, verified, and Safe Condition Checks are complete).

5.3.4. Tagout Index

Actionee	*Step*	*Action*
COA	a.	Enter date installed in Block #3 on *Tagout Index*, (A-6000-514). This step does not have to be done prior to the release of work.

5.4 Perform the Required Field Work

Each AW shall install ***only*** their own lock(s) and "Danger" Tag(s), except as allowed by Section 5.10.1. An AW performing the work has the option to observe the initial shutdown of the system/equipment (e.g., loss of power). This does not preclude the requirement to perform a Safe-to-Work Check.

If any discrepancies are found during field activities of the lockout/tagout process, stop work and notify the COA/Authorizer.

Actionee	*Step*	*Action*
COA/ Supervisor	1.	Perform the following: • Verify that the TAF is complete (tags have been installed, verified, and Safe Condition Checks are complete). • Ensure the AW(s) are aware of the following: o Energy isolation boundaries

Actionee	*Step*	*Action*
		o Any special methods used for energy control o Personnel hazards o Safe condition checks • Provide an up-to-date copy of the TAF to the AW(s).
AW	2.	Perform a field walk down of the identified boundaries and install the over lock and tag as follows: If using a Primary Authorized Worker to perform a Field Walkdown, proceed to Section 5.10.2. • If the AW may be exposed to unacceptable hazards (e.g., high radiation conditions, confined spaces) while performing a field walkdown, a job specific instruction shall be written in the work instruction and approved by the Safety organization and COA, with agreement from the AW. The instruction shall provide justification for no walkdown or an alternate method of identifying boundaries. • Verify CO lock(s)/tag(s) are hanging on the required component(s). • Verify components are in the required position(s)/condition(s). When component position cannot be verified (by system response or visual indication), communicate with the COA for resolution. • Verify the information on AW tag is complete and legible. • Overlock/tag the CO lock(s)/tag(s). If a lockbox is used, verify that all the keys and/or equivalent protection indicators are in the lockbox then overlock and tag the lockbox.
	3.	Perform or witness a Safe-to-Work Check: • Prior to the start of work • Once per shift • If the configuration has changed • If the job location has been left unattended If using a Primary Authorized Worker (PAW) to perform a Safe-To-Work Check is justified, proceed to Section 5.10.3. Methods used to perform Safe-To-Work checks include one or more of the following: • Attempt to restart (ensure personnel are clear of the potential hazard). • Use of instrumentation. • Use of any other appropriate methods to assure energy control. The Safe-to-Work Check is expected to be performed independently of the Safe Condition Check, even if the AW observed COQW perform the Safe Condition Check. The AW is responsible for performing their Safe-to-Work Check in accordance with the criteria above.

Actionee	Step	Action
		Voltage checks shall be conducted where electrical shock hazards exist. In the case where the hazardous energy is mechanical with an electrical motive force, an AW may request a voltage check on the electrically powered component.
	4.	Perform the work.
	5.	When the AW is no longer exposed to the hazard(s) controlled by the CO lockout and is ready to remove the AW lockout/tagout: a. Remove the AW lockout/tagout. Each AW shall remove only their own locks and "Danger" tags, except as allowed by Section 5.10.1. b. Notify COA, either directly or through the field work supervisor, that the AW lock is removed.

5.5 Clearing a Controlling Organization Lockout/Tagout

The person removing the tag(s) shall have possession of the TAF. If conditions warrant, an up-to-date copy of the TAF may be used, provided the original is signed promptly after leaving the area.

Actionee	Step	Action
COA/FWS	1.	Sign and date in TAF Block #12 that the boundary identified in Block #7 is no longer required.
COA	2.	Review of work document(s). • Verify work task(s) supported by the TAF are complete. • Verify system configuration supports lock and tag removal. • Verify all AW locks are removed. • Determine it is safe to remove lock and tag.
	3.	Approve removal of tag(s) as follows: • Sign and date removal approval in TAF Block #28. • Identify Restoration Position/Condition in TAF Block # 29. • Refer to and/or revise special instructions in TAF Block #14 for removal instructions, if applicable. • Ensure performance of a pre-removal brief to include restoration position, associated hazards, and controls.
COQW (Remover)	4.	Ensure that affected personnel are safely positioned or removed from the area prior to re-energizing equipment.
	5.	Remove lock and tag in accordance with TAF, following any applicable

		removal instructions provided in Block #14.
	6.	Ensure component position is as specified in TAF Block #29.
	7.	Sign and date TAF Block #30 for each tag removed.
	8.	Return TAF and tag(s) to the COA or as directed.
COA	9.	Complete lock and tag removal as follows: • Verify correct lock(s)/tag(s) has been removed. • Notify affected worker(s). • Destroy tag(s).
	10.	Ensure the completeness and accuracy of all data recorded.
	11.	Enter closing date in Block #4 on *Tagout Index (*A-6000-514*)* when lockout/tagout is complete.

5.6 Removal of Energy Control Device(s) When AW Is Not Present on Hanford Site

Actionee	*Step*	*Action*
Manager/ Supervisor	1.	Verify the AW who applied the lockout device is ***not*** on the Hanford site. Employees in training at the HAMMER facility are not considered to be on the Hanford Site.
	2.	Make all reasonable efforts to contact and inform the AW that their lockout device will be removed. • A phone conversation with the AW, when documented, is considered adequate. • If the AW cannot be contacted, the AWs management may direct removal of the lock.
Manager/ Supervisor and COA	3.	If it is determined that the lock should be cut off, then the AWs supervisor, or designee, and a person from the CO shall be present (as a second check) to verify that it is the correct lock prior to cutting it off.
	4.	Determine that it is safe to remove the lockout device(s).
	5.	Confirm that this is the correct lock and remove it.
	6.	Inform the AW of the lock and/or tag removal promptly upon their return to work.

5.7 Procedure for Partial Clearance of Tags

Individual tags may be cleared prior to the clearance of the entire tagout. Partial clearances are allowed when using multiple work packages on the same TAF, if tags **ARE NOT** required by the other listed work packages. Work may need to be suspended and associated AW locks removed to accommodate lockout/tagout partial clearance.

Actionee	*Step*	*Action*
COA(Preparer)	1.	TAF Block #15: Enter tag number(s), justification, and indicate the reason for partial clearance.
	2.	TAF Block#6: Re-enter information.
	3.	TAF Block #7: List applicable tag(s) for new lockout/tagout boundary.
	4.	TAF Block #8: Enter summary of work to be performed or basis for the tags.
	5.	TAF Block #9: List the personnel hazard(s) that require lockout/tagout.
	6.	TAF Block #10: Sign and date to signify that the lockout/tagout boundary and paperwork are adequate and accurate for the task.
COA (Tech Reviewer)	7.	Perform an independent technical review to verify the adequacy and accuracy of the lockout/tagout boundary and paperwork. Sign and date TAF Block #11. (See Step 5.2.8)
COA	8.	Return to Section 5.5 to clear tag(s).

5.8 Replacement/Addition of Tags

This section covers the process for adding tags or the replacement of missing, damaged, or illegible tags. If lockout is intact, a second Safe Condition Check is not necessary. Work may need to be suspended and associated AW locks removed to accommodate a lockout/tagout addition. For previously installed tags that need to be replaced (e.g., missing, damaged, illegible), the process to partially clear the tag(s) shall be completed per Section 5.7.

Actionee	*Step*	*Action*
COA(Preparer)	1.	TAF Block #15: Document reason for addition of tag(s).
	2.	Complete TAF Blocks #6-9. • TAF Block #6: Enter work authorization(s), procedure number(s), or step number(s) that are pertinent to this lockout/tagout and consistent with the reason for tagging identified in TAF Block #8.

Actionee	*Step*	*Action*
		• TAF Block #7: Enter tag numbers applicable to the work authorization/procedure. • TAF Block #8: Enter summary of work to be performed or the basis for the tags. • TAF Block #9: List the personnel hazard(s) that require the lockout/tagout.
	3.	Complete TAF Blocks #19-23, 31, and 32 for added tag(s). • TAF Block #19: Enter the sequential number of the tag; (i.e., 1, 2, 3). • TAF Block #20: Enter a clear, specific description that uniquely identifies each component to be tagged. • TAF Block #21: Enter the location of the component. • TAF Block #22: Enter the lock number if a lock is required. The lock number may be filled in at the time of installation. • TAF Block #22: Enter "N" if a lock is not required. If a lock cannot be installed, an alternative method of equivalent protection shall be used. Enter equivalent method information in Block #14. • TAF Block #23: Enter the required position/condition of the component . Use clear/concise terms that appear on the component indicator, when present. • TAF Block #31: Enter the number(s) of the tag(s); e.g., 1, 2, 3, 4-7. • TAF Block #32: Enter instructions for Safe Condition Check.
	4.	TAF Block #14: Add any special instructions (e.g., alternate means of protection, special installation instructions).
	5.	Prepare the "Danger Do Not Operate" tags to be used. **The information on the tags shall match the information on the TAF.** See Appendix B for directions if necessary.
	6.	TAF Block #10: Sign and date to signify that the lockout/tagout boundary and paperwork are adequate and accurate for the task.
COA(Tech Reviewer)	7.	Perform an independent technical review to verify the adequacy and accuracy of the lockout/tagout boundary and paperwork. Sign and date

Actionee	*Step*	*Action*
		TAF Block #11. (See Step 5.2.8)
COA	8.	Complete tag installation as described in Section 5.3.
	9.	When new tags have been added, sign and date TAF Block #12 stating that the previous lockout/tagout boundary in Block #7 is no longer applicable.

5.9 Authorized Worker Locks and Tags Alone Using the Eight Criteria

Use the Eight Criteria Checklist (A-6003-801) (Eight Criteria are listed in Step 5.2.1) when performing work in this section. Instructions for use are contained on the Checklist. The checklist does not authorize work to begin. Follow the normal work control process for the facility/location where work will be performed.

Actionee	*Step*	*Action*
COA	1.	Identify energy isolation point and complete the Eight Criteria Checklist (A-6003-801).
COA and AW	2.	Verify and concur the identified energy isolation point is correct. • Agree to use the eight criteria or use a CO Lockout/Tagout.
COA/Supervisor	3.	Conduct a lockout/tagout pre-installation brief with AW(s) that covers positioning, isolation, and Safe-To-Work checks.
COA	4.	Determine that it is safe to shut down the system.
	5.	Notify affected worker(s) of intent to de-energize equipment.
COQW/AW	6.	Shutdown or ensure equipment is shutdown or otherwise de-energized by relieving, disconnecting, restraining, or otherwise rendering safe any stored or residual energy. • An AW performing the work has the option to observe the initial shutdown of the system/equipment (e.g., loss of power). • If a lock and tag will prevent performing the Safe-to-Work Check per Step 5.9.9, then perform the Safe-To-Work check before installing the lock.
	7.	Ensure component is in the required position.

Actionee	*Step*	*Action*
AW	8.	Securely attach the lockout device and completed "Danger" Tag (54-6001-955) at the same point. Each AW shall install ***only*** their own lock and "Danger" tag, except as allowed by Section 5.10.1. • Verify visually and physically (as long as another lockout/tagout is not installed) that the lockout device is adequately installed to prevent inadvertent operation of the component, as desired.
	9.	Perform or witness a Safe-to-Work Check: • Prior to the start of work. • Once per shift. • If the configuration has changed. • If the job location has been left unattended. Methods used to perform Safe-To-Work checks include one or more of the following: • Attempt to restart (ensure personnel are clear of the potential hazard). • Use of instrumentation. • Use of any other appropriate methods to assure energy control. Voltage checks shall be conducted where electrical shock hazards exist. In the case where the hazardous energy is mechanical with an electrical motive force, an AW may request a voltage check on the electrically powered component.
	10.	Perform work.
	11.	Determine that it is safe to remove the AW lockout device. • Work is complete and/or equipment is in a safe configuration that supports lock and tag removal, • Other AWs continue to work and maintain control over the isolating device, or • A CO lockout/tagout is installed to replace the AW lockout/tagout.
	12.	Remove AW lockout device. Each AW removes ***only*** their own locks and "Danger" tags, except as allowed by Section 5.10.1.
	13.	If authorized to restore equipment to service, ensure that personnel are safely positioned or removed from the area.
	14.	Notify the COA, either directly or through the field work supervisor, that the AW lockout/tagout is removed.

Actionee	*Step*	*Action*
COA	15.	Notify affected workers when lockout/tagout is removed.

5.10 Exceptions

5.10.1 AW Lock Removal/Reinstallation by a Different AW

Actionee	*Step*	*Action*
AW	1.	Perform the initial application of the AW Lock. When the removal/reinstallation of the AW lockout device introduces the AW to additional safety hazards (e.g., radiation or contamination exposure potential), the lockout/tagout may be removed and/or reinstalled by another AW at the request of, and under the verbal direction of, the original AW.
COA		In such extreme non-routine cases: a. Formally document this exception (e.g., work package, work record, acceptance test plan). b. At a minimum, address by way of a briefing.
AW		c. Establish direct communications between original AW and person removing/reinstalling the AW Lock. d. Perform Safe-to-Work Check each time AW Lock is reapplied.

5.10.2 Using a Primary Authorized Worker Boundary Walkdown

Actionee	*Step*	*Action*
COA/Manager	1.	Authorize a PAW to perform a boundary walkdown when additional safety hazards exist due to nature of work or the size of work crew. **Each AW has the right to verify the lockout/tagout boundary(ies) if they so choose.**
Work Crew	2.	Designate the PAW(s).
PAW	3.	Perform a field walk down of the identified boundaries and install the over lock and tag as follows: • Verify CO lock(s)/tag(s) are hanging on the required component(s). • Verify components are in the required position(s)/condition(s). When component position cannot be verified (by system response or visual indication), communicate with the COA for resolution. • Over lock/tag the CO lock(s)/tag(s); if a lockbox is used, verify that all the keys and/or equivalent protection indicator are in the lockbox and then overlock/tag the lockbox.
Supervisor or	4.	Communicate to the work crew that the lockout/tagout is in place.

Actionee	*Step*	*Action*
PAW(s)		
AW	5.	Install the AW(s) lock as follows: • Verify the information on AW tag is complete and legible. • Over lock/tag the CO lock(s)/tag(s); if a lockbox is used, over lock/tag the lockbox.
	6.	Return to Section 5.4, Step 3.

5.10.3 Using a Primary Authorized Worker (PAW) Safe-to-Work Check

Actionee	*Step*	*Action*
COA/Manager	1.	When additional safety hazards exist due to the nature of the work, authorize a PAW to perform a Safe-to-Work Check under the following conditions: • A written justification (work package comments, pre-job sheet, etc.) is obtained from the COA, and • It is agreed to by the workers. **Each authorized worker has the right to perform or witness a Safe-to-Work check if they so choose.**
Work Crew	2.	Designate the PAW(s).
PAW	3.	Perform or witness Safe-To-Work check. • Prior to the start of work. • Once per shift. • If the configuration has changed. • If the job location has been left unattended.
	4.	Methods used to perform Safe-To-Work checks include one or more of the following: • Attempt to restart (ensure personnel are clear of the potential hazard). • Use of instrumentation. • Use of any other appropriate methods to ensure energy control. The Safe-to-Work Check is expected to be performed independently of the Safe Condition Check even if the PAW observed the safe condition check. Voltage checks shall be conducted where electrical shock hazards exist. In the case where the hazardous energy is mechanical with an electrical motive force, an AW may request a voltage check on the electrically

Actionee	*Step*	*Action*
		powered component.
Supervisor or PAW	5.	Communicate to the work crew that the Safe-To-Work Check is complete.
	6.	Return to Section 5.4, Step 4.

5.10.4 Adding Work Packages to a Previously Installed Lockout/Tagout

Actionee	*Step*	*Action*
COA/Manager	1.	When determined by facility management that it is necessary to add an additional work package to an existing TAF: • Ensure that the addition of the work scope does not affect worker safety. **NOTE:** *Each Work Authorization/Documentation may not use all tags on the TAF.*
COA(Preparer)	2.	Identify the lockout/tagout boundary for the new work package using any appropriate means necessary (e.g., approved drawings, engineering sketches, databases, documents, field walkdown). • Refer to Appendix C for hazardous energy isolation controls. • The facility specific identification on the label should match the identification on the drawing. If it does not, then pursue the appropriate method to make them the same (e.g., install a temporary label, initiate a drawing change). If no drawing is available, use any means necessary to determine the correct identification with concurrence from system subject matter expert.
	3.	Ensure that the existing lockout/tagout boundary and safe condition check(s) are adequate for the work scope and incorporate, at a minimum, all components identified in step 2 above. Determine if additional tags are required to establish a safe work boundary. **NOTE:** *It is desirable to perform safe condition checks as near to the work area as possible. Since the new work package may address work to be performed at a different location, under the same boundary, an additional safe condition check may be required at that location.*
	4.	Prepare the TAF. Appendix B contains TAF clarifications by

Actionee	Step	Action
		block. • TAF Block #4: Add the identification of all applicable control drawings, drawing change documents, and/or other methods used to establish isolation boundaries. • TAF Block #5: Enter additional lockbox information, as required. • TAF Block #6: Enter all work authorizations, procedure numbers, or step numbers that are pertinent to this lockout/tagout and consistent with the reason for tagging identified in TAF Block #8. • TAF Block #7: Enter tag numbers applicable to the work authorization/procedure, including additional tag numbers if required. • TAF Block #8: Enter summary of work to be performed or the basis for tags. • TAF Block #9: List personnel hazard(s) that require the lockout/tagout. • TAF Block #14: Update or enter additional special instructions (such as sequence of tag removal) as required. • TAF Block #32: Update or enter additional safe condition checks as required. Specify that the additional safe condition check is new by designating as "NEW."
		5. If no additional tags are required proceed to Step #6. If additional tags are required to establish a safe boundary perform the following: • TAF Block #13: Enter the tag number(s) (e.g., 1, 2, 3). • TAF Block #14: Enter any required special instructions, such as sequence of tag installation/removal, alternate methods of protection equivalent to a lockout, if unable to use a lock, etc. • TAF Block #15: Document reason for addition of tag(s). • TAF Block #19: Enter the sequential number of the tag (i.e., 1, 2, 3). • TAF Block #20: Enter a clear, specific description that uniquely identifies each component to be tagged. • TAF Block #21: Enter the location of the component. • TAF Block #22: Enter the lock number if a lock is required. The lock number may be filled in at the time of installation. • TAF Block #22: Enter "N" if a lock is not required. If a lock cannot be installed, an alternative method of equivalent protection is to be used. Enter equivalent method information in Block #14. • TAF Block #23: Enter the required position/condition of

Actionee	*Step*	*Action*
		the component. Use clear/concise terms that appear on the component indicator when present. • TAF Block #31: Enter the number(s) of the tag(s); (i.e., 1, 2, 3, 4-7). • TAF Block #32: Enter instructions for Safe Condition Check. • Prepare the "Danger--Do Not Operate" tags to be used. **The information on the tags shall match the information on the TAF.** See Appendix B for directions, if needed. The information on the tags shall match the information on the TAF. See Appendix B for directions, if needed.
	6.	TAF Block #10: Sign and date to signify that the lockout/tagout boundary and paperwork are adequate and accurate for the task.
COA (Tech Reviewer)	7.	TAF Block #11: Sign and date indicating completion of an independent technical review to verify the adequacy and accuracy of the lockout/tagout boundary, safe condition checks, and paperwork. • Use controlled drawings, engineering change notices (ECN), facility modification packages (FMP), approved sketches, field walk downs, and other available documents and means to verify the adequacy of the lockout/tagout. • Review isolation boundaries and ensure that they are technically adequate and administratively accurate to effectively control hazardous energy. • Ensure that the TAF and additional tag(s) (if required) are properly prepared and documented in accordance with this procedure.
COA/Supervisor	8.	Conduct a lockout/tagout briefing with personnel performing work under the TAF. The Lockout/Tagout briefing shall include at a minimum: • Scope of work pertaining to the additional work package. • Identification of safe to work checks as agreed upon by AWs, FWSs and COAs. • Requirement for all personnel to be clear of equipment during performance of the safe to work checks. This needs to be coordinated with any existing work in progress. • Review any additional safe condition checks as required.
	9.	Proceed to tag installation in Section 5.3 if installing additional

Actionee	*Step*	*Action*
		DDNO tags. **NOTE**: *Steps 10 through 12 are only applicable when "NEW" Safe Condition Checks are required.*
COA/Supervisor	10.	Ensure that all personnel are clear of the equipment/system for which the boundary has been established and all work activities listed on the TAF have stopped prior to allowing "NEW" Safe Condition Checks.
COQW	11.	Perform or witness "NEW" Safe Condition Check(s) as required. Ensure any special conditions for performing the safe condition check are met.
	12.	TAF Block #32: Sign and date the "NEW" Safe Condition Check.
COA/Supervisor	13.	Return to Section 5.4.

5.11 Controlling Organization Lockout/Tagout Surveillance Process

Actionee	*Step*	*Action*
COA	1.	Establish and document periodicity of lockout/tagout surveillance, at least quarterly, on TAF Block #16. Frequency may be adjusted and documented on TAF Block #16 based on special considerations to include: • Access limitations • Hazards • Duration of TAF **NOTE:** *Lockouts/Tagouts that are in areas that pose an unacceptable safety risk such as radiological, hazardous chemical zones, or high overhead areas may be excluded from periodic surveillance.*
	2.	Perform and document surveillance using a *Lockout/Tagout Surveillance Checklist* (Site Form A-6003-747).
	3.	For all CO locks and tags found missing, damaged, or illegible at the time of the surveillance, return to Section 5.8.
	4.	TAF Block #16: Initial and date for the completion of the surveillance on each TAF reviewed.

5.12 Hazardous Energy Control Periodic Review

Actionee	*Step*	*Action*

Actionee	*Step*	*Action*
Individual Contractor Management	1.	Issue annual review requirement letter and lines of inquiry.
COA	2.	Make arrangements with AW and qualified person that are independent of the lock and tag process at the facility to perform an annual periodic review of the content, implementation, and performance of the Hazardous Energy Control Program used at the facility.
COA/ COQW	3.	Perform a walk down of 100% of the installed TAFs (This step may be performed in conjunction with the surveillance per Section 5.11).
	4.	Review previous calendar year TAFs (inactive) and available Eight Criteria Checklists for compliance.
	5.	Document results of the review.
Training	6.	Provide AWs the opportunity to submit input and feedback into this procedure annually. • Discussion of individual responsibilities, • Does the program provide adequate protection for the worker? **NOTE**: *This activity occurs during annual Refresher Training.*
Individual Contractor Management	7.	Complete the following: • Review data for trends and common problems for the site. • Provide follow-up information to facilities as appropriate. • Provide any unresolved comments received to the Hanford Site Lockout/Tagout Committee (see Charter).

6.0 FORMS/TAGS

The following forms/tags (or equivalent) are used by this procedure. "Danger Do Not Operate" tags shall be constructed to include an adhesive laminate to be affixed after tag completion.

- 3x5-1/2 *Danger Tag*, (AW) 54-6001-955. Passport ID 551639
- *7-3/8 x4 Danger Do Not Operate Tag*, 37-8350-035, Passport ID 551450
- 2-1/2x3 *Danger Do Not Operate Tag*, 37-8350-036, Passport ID 551451
- *Eight Criteria Checklist*, A-6003-801
- *Lock and Tag Surveillance Checklist*, A-6003-747
- *Tagout Authorization*, A-6004-460
- *Tagout Index*, A-6000-514

7.0 RECORD IDENTIFICATION

Performance of this process generates the following records. Records shall be maintained in accordance with contractor records management processes.

Records Capture Table

Name of Document	Submittal Responsibility	Retention Responsibility
Tagout Authorization, A-6004-460	Initiator	Work package, minor work authorization, or Project records
Eight Criteria Checklist, A-6003-801	Initiator	Work package, minor work authorization, or Project records
Tagout Index, A-6000-514	Initiator	Work package, minor work authorization, or Project records
Lock and Tag Surveillance Checklist, A-6003-747	Initiator	Project records
Hazardous Energy Control Program annual periodic review inspection records, including deficiencies	Facility management	Project Records

8.0 REFERENCES

10 CFR 851, *Worker Safety and Health Program*
CRD O 5480.19, Chg 2 (Supplemented Rev. 4), *Conduct of Operations Requirements for DOE Facilities*
MSC-PRO-066, *Electrical Utilities Lock and Tag Program*
NFPA 70E, *Standard for Electrical Safety in the Workplace*
U.S. Code of Federal Regulations, Title 29, *Labor*, Part 1910.147, *The Control of Hazardous Energy (Lockout/Tagout)*
U.S. Code of Federal Regulations, Title 29, *Labor*, Part 1910.333, *Lockout and Tagging*
U.S. Department of Energy (DOE) Order 5480.19, Change 2, Attachment 1, Chapter IX , *Lockout and Tagouts*

APPENDIX A
Definitions

Affected Worker	A person whose job requires them to operate or use a machine or piece of equipment on which servicing or maintenance is being performed, or whose job requires them to work the immediate location in which such servicing or maintenance is being performed, under hazardous energy control lockout/tagout.
Authorized Worker (AW)	A person who installs and removes their AW lock and/or danger tag on a lockbox or an isolation component(s) for equipment or systems to perform servicing or maintenance on that equipment, or system.
Authorizer	The COA person that has been designated to authorize the lockout/tagout to be installed and/or cleared.
Component	A device that controls the transmission or release of energy or hazardous materials. Examples include restraint blocks, electrical circuit breakers, disconnect switches, slide gates, slip blinds, or line valves. For lockout purposes, components designed to accept a lock and that provide visible indication of the component's position are desirable.
Construction	In project architecture and civil engineering, the building or assembly of any infrastructure on a site or sites.
Constructor	Persons, firms, and corporations engaged in the construction business as a developer-builder, design-builder, general contractor, prime contractor, trade contractor, or construction manager who undertakes a project for an owner or contractor and has a contractual responsibility for assigned project outcomes.
Controlling Organization (CO)	The organization responsible for establishing and maintaining isolation boundaries associated with the work to be performed.
Controlling Organization Administrator (COA)	Individuals designated by CO management and trained to perform Tagout Authorization Form (TAF) preparation, technical review, or authorization. The COA is trained to the same level as a Controlling Organization Qualified Worker (COQW) and may perform assigned activities as a COQW.
Controlling Organization Qualified Worker (COQW)	Individual designated by CO management and trained to perform CO lockout/tagout installation, independent verification, safe condition checks, and removal.

Danger-Do-Not-Operate Tag (DDNO)	The tag used by COs to perform hazardous energy or hazardous material lockout/tagouts. This tag and its use are specific to the CO. No servicing or maintenance may be performed under this tag unless a "Danger" tag has been installed by an AW either as an overlock or on a lockbox.
"Danger" Tag	The tag used by AWs to perform authorized worker lockout/tagout. This tag is for the personal protection of the AW who is performing servicing or maintenance under this tag.
Durable	(*1*) Lockout and tagout devices capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected. (*2*) Tagout devices are constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible. (*3*) Tags will not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.
Exclusive Control	Under the exclusive control of the employee means that the authorized employee has the authority to, and is continuously in a position to, prevent (exclude) other individuals from re-energizing the machine or equipment during his servicing or maintenance activity.
Energy Source	Any source of hazardous energy or materials. Sources include electrical, mechanical, hydraulic, pneumatic, chemical (toxic, hazardous, dangerous, radiological, carcinogenic), radiation generating devices, and thermal energies, as well as various forms of potential energy, such as that stored in springs, compressed gases, or in suspended objects (gravitational).
Equipment	The term equipment in this document is intended to be interchangeable with the term "equipment, machinery, or system."
Equivalent Protection Indicator	A small phenolic, Bakelite™ or similar label hung in a lockbox to indicate that equivalent protection to a lock is being used, in place of a lock, in conjunction with a tagout.
Gagging Device	A device designed to block off or obstruct operation of a valve (also called "jacking device").
Greenfield Construction	A new installation of facilities, equipment, or systems without the requirement of integrating systems that could directly affect an existing operational configuration.

Independent Verification	An additional verification by a second individual, operating independently after the original performance to verify a specified condition exists. The independent reviewers must determine for themselves that the information is adequate and accurate for the task to be performed. Typically, the highest level of independence is achieved when a separation in time and space exists between the individuals involved.
Installed	A CO lockout/tagout is considered installed after the TAF has been signed by both the installer and verifier, all safe condition checks have been performed, and keys are properly controlled.
Installer	The COQW that installs the lock and tag.
Isolation Boundary	Those isolating components that are configured and checked to provide a safe condition where servicing and maintenance are to be performed.
Knowledgeable Person	One who possesses the skill, expertise, or demonstrated ability (through education, training, or experience) to determine safe work boundaries for lockout/tagout on specific equipment or systems to accomplish effective control of hazardous energy.
Lock	A device that requires a key (not a combination lock) to operate and holds a component in the required position for the protection of personnel.
Lockbox	A specifically identified and job-specific container or device used in group lockout activities which is capable of being locked. A lockbox contains keys and equivalent protection indicators used to control the components (e.g., hand wheels, fuses, tagout forms) that are stored and controlled by attachment of AW personal locks.
Lockout/Tagout	Installation of a lock and “Danger” or “Danger-Do Not Operate” tag on a component to include all sources of hazardous energy such that operation of the isolation component is prohibited and forcible removal of the lock is required for operation.
Lockout Device	A device that uses a positive means, such as a lock, to hold an energy isolating component in a safe position and prevent the energizing of equipment. When properly installed, a blank flange or bolted slip blind are considered equivalent to lockout devices.
Logbook	A binder or file cabinet that contains, at a minimum, the index and the active TAFs. The logbook may contain a list of CO personnel, procedure, and other lockout/tagout information.

Normal Production Operations	The utilization of equipment to perform its intended production function.
Overlock/Overtag	Installation of a lockout/tagout on top of another lockout/tagout. Examples include: • The installation of a lock and "Danger" tag by an AW on top of the COs lock and "Danger-Do Not-Operate" tag • The installation of a CO lockout/tagout on top of an Electrical Utilities Operations clearance • The installation of a CO lockout/tagout on top of another facility's CO lockout/tagout.
Partial Clearance	Clearing of a subset of the tags that define a lockout/tagout boundary and therefore forces a new lockout/tagout boundary to be determined. For example: Tags 1, 2, 3 and 4 are installed and the work is started. At some point, Tag 4 needs to be cleared to allow startup of a portion of the system to permit work to proceed. This defines a new lockout/tagout boundary (Tags 1, 2, 3) and requires re-evaluation.
Preparer	A COA knowledgeable on the equipment being tagged and has been designated to prepare the TAF.
Primary Authorized Worker (PAW)	A member of the work crew designated with the responsibility to verify for a group of AWs that the boundary isolation steps taken have in fact isolated the machine or equipment effectively from the employees. The Primary Authorized Worker (PAW) may be used for initial authorized worker isolation verification or the safe-to-work checks for a group of employees working under the same lockout/tagout authorization.
Readily Identified	Easily determined to be the correct component for the equipment or system to be serviced and is positively known to be accurate, by both the CO and AW. This is accomplished by visual confirmation or a review of verified documentation reflecting current system configuration. Verified documentation includes a previous TAF or investigative package containing electrical circuit confirmation.
Remover	The CO person that removes the installed lock and tag.
Safe Condition Check	The comprehensive inspection or test of the lockout/tagout boundary performed for/by the COQW to ensure that the lockout/tagout boundary is controlled to prevent exposure from all identified sources of hazardous energy/material.
Safe-To-Work Check	The inspection or test performed by the AW to ensure that no hazardous energy exists where will perform servicing or maintenance.

Servicing and/or Maintenance	Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of equipment, and making adjustments where the employee may be exposed to the *unexpected* energization or startup of the equipment or release of hazardous energy.
Substantial	*(1) Lockout devices.* Lockout devices are substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools. (2) *Tagout devices*. Tagout devices, including their means of attachment, are substantial enough to prevent inadvertent or accidental removal. All DDNO tags shall be attached by grommet and/or by a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.
Technical Review	A review to properly identify, document, and verify the isolating boundaries through the use of accepted controlled as built drawings/databases, specific written procedures, field walk-downs, or any means necessary to verify that the boundaries are adequate and accurate as well as ensuring the TAF and the tags are correct. Such review may be assisted by other technical resources, where deemed necessary.
Technical Reviewer	A COA person that is knowledgeable on the equipment or system and has been designated to perform the independent technical review of a lockout/tagout.
Unattended	Equipment or lockbox with an AW lock installed is considered “attended” for that worker. By removing the individual’s AW lock, the job location is considered unattended for that worker.
Verifier	The COQW that independently verifies that the lockout/tagout been installed correctly.

Work Crew	All AWs working within the lockout/tagout boundary. The PIC or supervisor may be considered part of the work crew.
Work Documents	Procedures, work packages, job hazard analyses (e.g., Automated Job Hazard Analysis), TAFs, checklists, permits, instructions, and associated documents used in the field to directly control the work being performed.

APPENDIX B
Lockout/Tagout Forms Clarifications/Directions

Complete the blocks legibly in permanent and reproducible ink or electronically using the forms listed in Section 6.0. **Block numbers do not specify sequential performance.**

Tagout Authorization Form	
TAF Block #	**How to Complete This Block**
1.	Enter the next sequential number from the *Tagout Index* (A-6000-514); include on all additional pages of the TAF.
2.	Enter page number.
3.	Enter the system name, number, or abbreviation.
4.	Enter the identification of all applicable control drawings, drawing change documents, and/or other methods used to establish isolation boundaries.
5.	Enter lockbox information (e.g., lockbox number, lockbox location).
6.	Enter work authorization(s), procedure number(s), or step number that are pertinent to this lockout/tagout and consistent with the reason for tagging identified in TAF Block #8. Enter N/A or TBD if no work authorization/procedure applies.
7.	Enter tag numbers applicable to the work authorization/procedure. • This block should show all current tags providing the lockout/tagout boundary (e.g., 1,2,3,4, or 1 thru 4, or 1-4). • When doing partial clearance, addition(s), or replacement(s), list applicable tags for new lockout/tagout boundary.
8.	Summarize the work that is to be performed or the basis for the tags to be hung.
9.	List the hazards that require these tags to be hung. Some examples are: • Electrical • Mechanical • Hydraulic • Pneumatic • Chemical • Radiation Generating Devices (RGD) • Thermal energy

	• Potential energy (springs, compressed gases, suspended objects) • Potential release of hazardous material (contaminated fluids, etc.)
10.	The preparer shall sign this block prior to presenting for technical review. By signing this block, the preparer is stating that the TAF and tags are complete, technically accurate, and adequate to support the work. The person that signs for "prepared by" ***shall not*** sign for "technical review."
11.	Perform an independent technical review using whatever means necessary to verify: • The lockout/tagout boundary is adequate for the work. • The TAF is completed correctly. • The tags are correct. Sign for each line as if it is stand alone. Each set of tags needs to independently support the work by itself. The person that signs for "technical review" ***shall not*** sign for "prepared by".
12.	Determine if the task(s) requiring the lockout/tagout boundary is complete. Sign for each line as if it is stand alone. Each set of tags independently supports the work.
13.	Enter all tag numbers.
14.	Enter any special instructions associated with installing or removing applicable tag number(s), as listed in Block #13, such as: • Sequence of tag installation/removal. • When unable to use a lock an alternate method to provide protection equivalent to a lockout is required. Write that information in this block (e.g., removing an isolating circuit element or fuse, blocking switch controls, opening extra circuit disconnects, physical barriers, and removing valve handles). • Mark "N/A" for tags not requiring special instructions. If the verification cannot be done independently, state the reason why in this block.
15.	Enter the tag number(s) and reason for partial clearance or addition of tag(s).
16.	Document surveillance periodicity. See section 5.11. When the surveillance is complete, initial the block and enter the date.
17.	Enter the Lockout/Tagout number (from Block #1); include on all additional pages of the TAF.
18.	Enter the page number.

19.	Enter the sequential number of the tag; e.g., 1, 2, 3.
20.	Enter a clear, specific description that ***uniquely*** identifies each component to be tagged, including one or more of the following: • Component name • Facility specific identification number • Nameplate information Additional information such as a noun name descriptor or which electrical loads are supplied, while not necessarily on the label, may be added to the TAF and tag for clarification. Additional information that is written on the label in the field such as "Fed from breaker XX" is not considered part of the facility specific identification number and does not need to be written on the TAF or the tags. This information is entered on the tag exactly as written on the TAF.
21.	Identify the location of the component (e.g., room, building number, system).
22.	Write lock number. The lock number may be filled in at the time of installation. Enter "**N**" if no lock is required. If a lock cannot be installed, an alternative method of equivalent protection is to be used. Enter equivalent method information in Block #14.
23.	Enter the required position/condition. Whenever possible and where present, use the clear and concise terms that appear on the indicators for the component. The ultimate goal is to be clear to everyone involved in the work what the required position is.
24.	Determine if tag(s) installation is ready to be authorized: • Ensure all information on TAF is complete and accurate. • Review tag(s) for completeness. • Verify equipment/system conditions support the application of the lockout/tagout. Sign and date for each tag and sign "authorized by" on each tag.
25.	Ensure the following: • TAF and tag are authorized for installation. • If applicable, ensure any special instructions for installation are met. • The correct component is in the position specified in Block #23. • Install the lock (if required) on the component to prevent repositioning. • Secure the tag. • Ensure visually and physically (as long as another lockout/tagout is not installed) that the lockout device is adequately installed to prevent inadvertent

	operation of the component. After ensuring the items above: • Sign and date the tag. • Sign and date the TAF.
26.	Verify the following: • TAF and tag are authorized for installation. • If applicable, ensure any special instructions for installation are met. • The correct component is tagged. • Position/condition of component is correct as defined in Block #23. • Verify visually and physically (as long as another lockout/tagout is not installed) that the lockout device is adequately installed to prevent inadvertent operation of the component. • The lock number matches Block #22. • The tag is secured. • The tag is signed and dated by the installer. • The TAF is signed and dated by the installer. After verifying the above information: • Sign and date the tag. • Sign and date the TAF.
27.	The Safe Condition Check is done to assure that a lockout/tagout boundary has been created for the worker to do the work specified. The safe condition check is done for the tags noted in Block #7. Perform or witness the safe condition check as described in Block #32. Sign and date the TAF for each tag identified in Block #19.
28.	When signed, the tag is authorized to be removed. Before signing this block, ensure that the tag is no longer needed to support the identified lockout/tagout boundary. To accomplish this use one of the following methods: • Field inspection. • Discussion with the Person in Charge (PIC), Field Work Supervisor (FWS), AW. Verify: • It is safe to remove the lock & tag. • All AW locks are removed. • System configuration supports lockout/tagout removal.
29.	Enter the position that the component is to be left in after clearing the lockout/tagout. Always provide a position even if it is the same as was required by the lockout/tagout.
30.	Remove the lockout/tagout: • Verify that Block #28 for this tag has been signed.

	• Remove the lock and tag, leaving component in the position required. Refer to the special instructions in Block #14 if necessary. • Sign and date. • Return TAF and tag(s) to the COA or as directed.
31.	Enter the number(s) of the tag; e.g., 1, 2, 3.
32.	Enter the Safe Condition Check instructions, or the step of the work document describing the safe condition check (e.g., methods, location). Consider the entire lockout/tagout boundary when determining the safe condition check. Refer to Appendix D. **NOTE:** *Reference previous safe condition checks for missing or damaged tag replacements if the lockout device remained in place.* **NOTE:** *If multiple work packages are used and it has been determined that additional safe condition checks are required, specify that the additional safe condition check is new by designating as: "NEW".* Since Block #27 has already been signed, the safe condition check signature and date can be entered next to the "NEW" safe condition entry.

Tagout Index	
Index Block #	**How to Fill Out This Block**
1.	Maintain a sequential list of facility specific numbers.
2.	Identify the system or component(s) being isolated. It is not necessary to list where the tag(s) are being placed.
3.	Enter the date that the lockout/tagout was installed.
4.	Enter the date that all installed tag(s) was removed and the TAF no longer required.

Danger Do Not Operate	
Component Tagged	Enter information from TAF Block #20.
Component Position	Enter information from TAF Block #23.
Lockout/TagOut No.	Enter information from TAF Block #1.
Tag No.	Enter information from TAF Block #19.
Logbook Location	State the location of the logbook/index at the facility (room #, SOM office, etc.). Be specific enough for facility personnel to know where to find it.
Lock No.	Enter information from TAF Block #22. The lock number may be filled in at the time of installation.

Authorized by:	Signed and dated by COA. Use the criteria listed in the directions for completing TAF Block #24.
Installed by:	Signed and dated by COQW. Use the criteria listed in the directions for completing TAF Block #25.
Verified by:	Signed and dated by COQW. Use the criteria listed in the directions for completing TAF Block #26.

APPENDIX C
Hazardous Energy Isolation Controls

The following information establishes the minimum requirements for hazardous energy or material isolation and control.

Specific provisions of this Appendix that cannot be met shall be included in the work planning and approval process to address alternative methods of hazard control and verification.

1.0 ISOLATING ELECTRICAL ENERGY

Live parts operating at 50 volts or more to which an employee might be exposed shall be put into an electrically safe work condition, using the process defined in this procedure, before an employee approaches nearer than the Limited Approach Boundary or Flash Protection Boundary (as defined by NFPA 70E) unless it can be demonstrated that de-energizing introduces additional or increased hazards or is infeasible due to equipment design. Until the area is verified free of all electrical hazards using the appropriate processes, electrical components shall be considered energized and appropriate controls, including PPE shall be incorporated to guard, isolate, or insulate the worker from exposure to electrical hazards.

1. Electrical Distribution. After reviewing available circuit drawings and minimizing the loads, open and lock/tag out electrical circuit breakers, switches, disconnects, or other devices that provide isolation to the area to be worked from all sources of electrical energy. Isolate, lock, and tag out control power as appropriate for the work to be performed.

2. Electrical Control Circuits. Do ***not*** use electrical control circuits as lockout/tagout boundary isolation points, since they do not provide adequate protection to interrupt main power. They may be tagged to protect the equipment, but they are insufficient to provide a safe condition and lockout/tagout isolation boundary for personnel protection.

3. Electrical Breakers. Use isolating techniques (such as racking out breakers, removing power fuses) as appropriate to ensure positive isolation from line electrical energy sources and to prevent the unexpected energizing of the circuit.

4. Electrical Tagout Requirements. A tag used without a lock shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device. Document all steps taken in order to demonstrate that the tagout is as effective as a lockout.

5. Simple Plug-In Electrical Tools/Equipment. Tagouts/lockouts are not required for plug-in electrical equipment if both the following apply:
    a. Exposure to the hazards of unexpected energization or startup of the equipment is controlled by unplugging the equipment from the energy source, and
    b. The plug is under the exclusive control of the employee performing the servicing or maintenance, at all times.

If work must be left prior to completion, return to a safe condition, establish a barricade or other alerting technique in accordance with NFPA 70E, or lockout in accordance with this procedure.

6. Energized Electrical Work. For work where de-energizing live parts is infeasible or otherwise justified, refer to NFPA 70E or the responsible company electrical safety procedure.

7. Working with Multi-Wire Branch Circuits and Other Neutral Hazards. Establish initial lockout/tagout boundaries by isolating all known sources of power using a combination of field walkdowns, document/drawing reviews, voltage checks, and system knowledge.

   If a potential neutral hazard is discovered in the field upon commencement of work, and the neutral circuit continuity cannot be maintained to complete the planned task, either by circuit design or lack of confidence in the circuit integrity, work shall be discontinued and the PIC/FWS and COA contacted.

   If further work planning, investigative review, and/or lockout/tagout boundary modification cannot guarantee complete isolation (e.g., the potential for system miss-wiring may still exist) work requiring interruption of neutral circuit continuity shall be conducted using the energized work processes determined by company procedures until the work area can be confirmed to be free of electrical hazards. Refer to Section 1.6 of this Appendix.

2.0 ISOLATING, ROTATING, OR MOVING EQUIPMENT

1. Lock and tag out the energy source(s) when working on rotating equipment.

2. Do ***not*** use power control switches as lockout/tagout boundary isolation points since they do not provide adequate protection to interrupt main power. They may be tagged to notify the user and prevent local operation but are insufficient to provide a safe condition and lockout/tagout isolation boundary for personnel protection.

3. If isolation from an energy source does not eliminate the potential for hazardous movement of equipment, block or otherwise secure the equipment to prevent such movement.

4. When blocking or securing devices are used, lock and tag them in place per this procedure.

3.0 ISOLATING ENGINE-DRIVEN EQUIPMENT (EXCEPT MOTOR VEHICLES)

1. Disconnect batteries or other sources of power and lockout/tagout, or

2. Disconnect batteries or other sources of power and remove or disconnect one or more essential operating part(s) (coil wire, rotor, etc.) retaining it under exclusive control of the AW.

4.0 ISOLATING LOW TEMPERATURE/PRESSURE FLUID SYSTEMS (LIQUID OR GAS)

NOTE: *Although steam condensate systems usually operate at relatively low temperatures and pressures, backfeeds, multiple energy sources, trap failures, etc., may create significant hazards to personnel. For this reason evaluate each situation carefully.*

- Establish lockouts/tagouts for systems that operate between 150-500 psig and/or 125-200°F.

- If it is determined by the COA and/or AW that a potential for personnel injury exists in a system that operates below 150 psig and/or 125°F that system shall have a lockout/tagout.

Use the following method:

1. Use at least one shutoff valve to provide isolation from each energy source.

2. Systems, portions of systems, and components that operate at temperatures or pressures above ambient should be vented and, if necessary for the performance of work, drained or cooled.

3. Whenever possible, an atmospheric drain and/or vent between the component to be worked and sources of pressure to the component should be locked in the open position to depressurize the equipment and to accommodate thermal expansion or contraction.

4. If a normal depressurization path cannot be provided within the lockout/tagout boundary, develop a written work plan using other methods to ensure that the system or component is adequately isolated, depressurized, and drained (such as loosening the fasteners on flanged connections or valve bonnets, removing instrument tubing, etc.).

5.0 ISOLATING HIGH TEMPERATURE/PRESSURE SYSTEMS/CRYOGENIC FLUIDS/LIQUID METALS/STEAM

NOTE: *Although steam condensate systems usually operate at relatively low temperatures and pressures, backfeeds, multiple energy sources, trap failures, etc., may create significant hazards to personnel. For this reason evaluate each situation carefully.*

When isolating steam systems or equipment whose operating temperature exceeds 200° F, operating pressure exceeds 500 psig, or systems that contain liquid metals or cryogenic fluids observe the following limits in addition to those in Section 4.0.

1. Use at least two shutoff valves in a series (“two-valve protection”) to provide isolation from the fluid. Apply the requirements for two-valve protection to all paths from which the fluid may cross the lockout/tagout boundary.

2. A lockout/tagout shall be installed on an open atmospheric drain or vent between the valves

to depressurize the equipment and to accommodate thermal expansion or contraction.

NOTE: *Two-valve isolation is **not** required for gas cylinders.*

3. Single-valve isolation may be used if the system operating controls are locked/tagged so that pressures greater than 500 psig and/or temperatures greater than 200° F cannot be reached. (For example, if a boiler is cooled down for maintenance and its operating controls are locked and tagged, work on the steam system may be done with single-valve isolation.)

4. If required two-valve protection cannot be obtained write a job specific instruction in the work instructions identifying the hazards and work methods to achieve protection equivalent to two-valve isolation. It shall be approved by the Safety Organization and the COA with agreement from the AW. The following conditions should be met:
    a. Alternate isolation devices (such as blank flanges, blocks, or freeze seals) have been considered and determined to be infeasible or impractical.
    b. The integrity of the single isolation valve is verified by venting or draining the portion of the system to be worked on and observing for leakage for at least 15 minutes to verify positive valve closure and leak tightness before starting work.

6.0 ISOLATING HAZARDOUS MATERIAL FLUID SYSTEMS

Systems containing hazardous materials (e.g. acids, bases) should be isolated and the isolated section should be depressurized. Verifying depressurization by breaking flanged connections, loosening valve bonnets, removing instrument tubing or other similar actions should be avoided unless no other means exists.

When hazardous systems are breached, at a minimum, the boundary isolation valve(s) shall be locked and tagged.

7.0 VALVE ISOLATION PRACTICES

1. Valves that Fail Open. Do ***not*** consider pneumatically or electrically operated valves that fail open, shut for isolation purposes unless the valve operating supplies are isolated and locked and tagged out and a jacking device or gagging device is installed and locked and tagged out to shut or keep the valve shut.

2. Valves that Fail Shut. Do ***not*** consider pneumatically or electrically operated valves that fail shut, shut for isolation purposes unless the valves are verified shut and the valve operating supplies are isolated and locked and tagged out.

3. Relief Valves. Relief valves and pressure safety valves are ***not*** used for isolation purposes.

4. Valve Operating Power. To use a pneumatically or electrically operated valve as the lockout/tagout boundary, isolate the motive energy source for the valve and lockout/tagout after the valve is in the required position.

5. Lock and Tag Out all Valve Operators. Lock and tag out all local and remote pneumatic and electric valve operators when the valve is used as a system isolation boundary point.

6. Regulators/Check Valves. Do ***not*** use regulators and check valves as a lockout/tagout boundary unless the valve is mechanically restrained in the required position with a gagging device designed for that purpose.

7. Valve Actuator Work. Consider additional isolation and specify as necessary to ensure protection when working on valve motor actuators with manual overrides, springs, or other operating mechanisms.

8.0 STORED ENERGY CONSIDERATIONS

After lock and tagouts are applied to energy isolating components, relieve, disconnect, restrain, ground, and otherwise make safe all potentially hazardous stored, residual, or reaccumulated energy.

All capacitors shall be discharged, and high capacitance elements shall also be short-circuited and grounded before the associated equipment is touched or worked on. Springs shall be released and physical restraint shall be applied when necessary to immobilize mechanical equipment and pneumatic and hydraulic pressure reservoirs. Other sources of stored energy shall be blocked or otherwise relieved.

APPENDIX D
Guidelines for Performing Safe Condition Checks

This section provides guidelines to ensure safe conditions are established when specifying the lock and tag boundaries for each of the hazard types listed. The COA determines the appropriate type of Safe Condition Check based on the risk to the worker and the hazards identified.

1.0 Safe Condition Check for Electrical Energy

1. If the hazard being controlled involves direct exposure to electrical energy, including shock or arc flash hazards, the following requirements apply. Requirements applicable to other hazards associated with electrically driven equipment (for example, rotating or moving equipment) are provided in Section 2.0.

Testing of Deenergized Electrical Circuits

2. During the lockout/tagout process, and before starting work, the circuit elements and electrical parts of equipment to which employees may be exposed shall be tested to verify that the circuit elements and equipment parts are de-energized, as follows:

    1. Whenever possible, visually verify that all blades of the disconnecting devices are fully open or that draw-out type circuit breakers are withdrawn to the fully disconnected position.
    2. Use an adequately rated voltage detector to test each phase conductor or circuit part to verify they are deenergized.
    3. Test each phase conductor or circuit part both phase-to-phase and phase-to-ground.
    4. Before and after each test, determine that the voltage detector is operating satisfactorily.
    5. Except in cases where not practical, or in the presence of a greater hazard (e.g., unnecessary exposure), electrical safe condition check(s) are to be performed at the physical work location or the closest accessible isolation device, component, or test point that will allow for a comprehensive test of the lockout/tagout boundary. Additional checks are allowable at the isolating device, when desired or deemed necessary.
    6. Where there is no accessible exposed point to take voltage measurements, planning shall include methods of verification.

2.0 Safe Condition Checks for Rotating and Moving Equipment

NOTE 1: *Either Step 1* ***or*** *Step 2* ***or*** *both are performed depending on the hazard identified.*

1. Operation of the equipment using the operating controls (if the controls are ***not*** DDNO tagged) shall be attempted to verify that the equipment cannot be started

and residual energy has been released. Always consider whether there are any interlocks or permissives that may prevent operation of the equipment.

2. Position indicators on electrical isolation devices or disconnecting devices are checked to verify the devices are open.

NOTE: *If electrical disconnects are not in good repair or are not properly identified, a voltage check is used to confirm that equipment is de-energized (Section 1.0).*

3.0 Safe Condition Checks for Fluid Systems

1. Vent(s) and/or drain valve(s) shall be monitored after the system is drained or vented, as appropriate to verify system pressure is released.

2. Verifying depressurization by breaking flanged connections, loosening valve bonnets, removing instrument tubing, or other similar actions should be avoided unless no other means for verifying depressurization exist. Strict supervisory controls and advance planning are required if these methods are used.

3. If verification that hazardous fluid systems are depressurized and drained is not feasible to be performed as a safe condition check, other options may be appropriate if addressed in TAF Block #14, “Special Instructions,” and/or TAF Block #32, “Safe Condition Checks.”