Hanford Site Lockout/Tagout

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1.0 PURPOSE

This procedure establishes the single process for the locking and tagging of machines, 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 integrity of physical boundaries.

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

2.0 SCOPE

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

- This procedure shall be used whenever workers 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.

- This procedure shall also be used to control potential hazardous energy to personnel when damaged equipment is removed from service pending corrective maintenance.

  NOTE: *The Danger Tag and associated lock shall be the only devices used by the authorized worker 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 potential inadvertent release to the environment, and maintain integrity of physical boundaries.

Equipment is not to be operated when 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 HNF-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 controlling organization (CO) lockout/tagout that can be overlocked/tagged by the Authorized Worker (AW) and must meet the requirements of this procedure and HNF-PRO-066.

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: 1) continuity of service is essential; 2) shutdown of the system is impractical; and 3) 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 equipment shutdown or deactivation not related to worker protection, servicing and maintenance (e.g., Administrative Lock Programs).

- 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 provided that 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.

  NOTE: *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.*

- Motor Vehicles.

- Use of Caution Tags.

3.0 IMPLEMENTATION

Effective July 1, 2008, implementation of this procedure commences.

4.0 REQUIREMENTS

This procedure implements the requirements of CRD O 5480.19, Chg 2 (Supplemented Rev 4), *Conduct of Operation Requirements for DOE Facilities*.

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 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.*

To be qualified to be a member of the CO; you 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 only Safe Condition Checks must be qualified Authorized Workers.

To be qualified as an AW, the AW must be current in lock and tag training.

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 (TAF or eight criteria) of lockout/tagout to use. • Assign, establish, and maintain isolation boundaries. • Prepare the TAF. • 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.

Actionee	*Type*	*Roles and Responsibilities*
		• 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. • Ensure that only CO Qualified Workers are assigned to perform CO lockout/tagout. • 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 qualified designee to escort outside contractor personnel. The escort remains with the outside person and ensures: o The correct placement of the outside service employee's personal lockout/tagout o Proper performance of the outside service employee's safe-to-work check o The correct removal of the outside service employee's personal lockout/tagout
Management	RR	• Ensure required training is maintained current and documented.
Hanford Site Lockout/Tagout Committee	RR	• Review and approve this procedure and any procedure changes. • Review and approve the lockout/tagout training.
Safety Organization Manager	RR	• Designate in writing the CO lockout/tagout technical authority. • Conduct periodic field reviews to ensure program effectiveness. • Conduct the annual assessment of the lockout/tagout program.
CO Lockout/Tagout Technical Authority	RR	• Function as the company point-of-contact for implementation and interpretation of this program.
CO Qualified Worker (COQW)	RR	• Install, verify, and remove CO's lockout/tagout. • Perform or witness safe condition checks that are performed in support of CO's 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(es) for their own safety in accordance with this procedure. • Remove only their own AW lock and Danger tag when it does not cause an unsafe condition. • Perform safe condition checks for CO. • Perform AW Safe-to-Work Checks.
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. • Sign TAF Block #12 signifying work complete for COA, as directed.

Type	*General Administrative Requirements*
GR	The person that signs for "prepared by" and the person that signs for "technical review" must 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; o be red, uniquely keyed, and o controlled.

Actionee	*Type*	*Roles and Responsibilities*
		• These 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. DDNO 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 a tag will be done by a single line cross-out and initialing and dating the change. All technical changes will require a review by a preparer and a technical reviewer.
	GR	If it is determined that the lock should be cut off, then the AW's supervisor, or designee, and a person from the CO must 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 that energy source will completely de-energize and deactivate the equipment, 4. The equipment is isolated from that 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 lockout device in the possession of the AW), 7. The servicing or maintenance does not create hazards for other workers, ***and*** 8. There is no incident or deficiency involving use of this exception for the machine or equipment, pending correction or resolution by the affected facility.
	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 number on the label should

Actionee	Step	Action

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, etc.) If no drawing is available, use whatever means necessary to determine the correct identification with concurrence from 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 can be added to a TAF after Lock and Tag has been installed by referring to section 5.10.4.*

   - Obtain the next sequential number from the Tagout Index (A-6000-514) and enter this number in TAF Block #1, 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.
   - Enter the page number in TAF Block #2.
   - Enter the system name, number, or abbreviation in TAF Block #3.
   - Enter the identification of all applicable control drawings, drawing change documents, and/or other methods used to establish isolation boundaries in TAF Block #4.
   - Enter lockbox information in TAF Block #5.
   - Enter work authorization(s) or procedure number(s) or step number in TAF Block #6 that are pertinent to this lockout/tagout and consistent with the reason for tagging identified in TAF Block #8.
   - Enter tag numbers applicable to the work authorization/procedure in TAF Block #7.
   - Enter summary of work to be performed or the basis for the tags in TAF Block #8.
   - List the personnel hazard(s) that require the lockout/tagout in TAF Block #9.

Actionee	*Step*	*Action*

- Enter the tag number(s) (e.g., 1, 2, 3, 4 -7) in TAF Block #13.
- 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., in TAF Block #14.
- Enter the Tagout number in TAF Block #17.
- Enter the page number in TAF Block #18.
- Enter the sequential number of the tag (e.g., 1, 2, 3) in TAF Block #19.
- Enter a clear, specific description that uniquely identifies each component to be tagged in TAF Block #20. (Examples may include one or more of the following: facility specific identification number, component name, nameplate information, etc.)
- Enter the location of the component in TAF Block #21.
- Enter the lock number in TAF Block #22 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.
- Enter the required position/condition of the component in TAF Block #23. Use clear/concise terms that appear on the component indicator, when present.
- Enter the number(s) of the tag(s); (e.g., 1, 2, 3, 4-7) in TAF Block #31.
- Enter instructions for Safe Condition Check in TAF Block # 32.

6. Prepare the tags to be used (*Danger Do Not Operate Tag*, 37-8350-035, 37-8350-036*).

   NOTE: *Asterisk denotes small tag for use where large tag cannot be used.*

   The information on the tags shall match the information on the TAF. See Appendix B for directions, if needed.

Actionee	Step	Action
	7.	Sign and date TAF Block #10 to signify that the lockout/tagout boundary and paperwork is adequate and accurate for the task.
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 (ECNs), facility modification packages (FMPs), approved sketches, field walkdowns 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 can be used provided the original is signed promptly after leaving the area.

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

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. • Conduct a lockout/tagout pre-installation brief with personnel performing installation, verification and Safe Condition Checks.
	b.	Authorize installation of the locks and tags by signing and dating TAF Block #24 and each tag.
COA	c.	Notify affected personnel of impending lockout/tagout.
COQW(Installer)	d.	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 is installed.
	e.	Install the lock (if applicable) and tag: • Place lock on the correct component. • Ensure visually and physically 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 TAF Block #22. • Install, sign, and date the tag. Ensure that the tag is secure and any special instructions from TAF Block #14 are met. The tag will be placed on the component or as close as possible without interfering with other indications or controlling devices to clearly indicate the condition.
	f.	Sign and date the TAF Block #25.

Actionee	Step	Action
	g.	Repeat Steps 5.3.1.d through 5.3.1.f as many times as necessary to install the specified lock(s) and tag(s).
COA/COQW	h.	Place key(s) under control (e.g., lockbox or key cabinet) if applicable.

2. Independent Verification of CO Lockouts/Tagouts

The verification process is expected to be done independently, but can be performed concurrently if justified in TAF Block #14. The justification must 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.

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

Actionee	Step	Action
COA	a.	Assign a different 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 that 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 that the lockout device is adequately

Actionee	Step	Action
		installed to prevent inadvertent operation of the component. • Lock # 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 locks and tags.
COA/COQW	f.	Verify key is controlled for each lock.

3. Perform Safe Condition Checks

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

Actionee	Step	Action
COQW	a.	Perform or witness Safe Condition Check (The safe condition check may have already been performed per Step 5.3.1, and does 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.*
	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).

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 installs ***only*** their own lock(s) and Danger Tag(s), (54-6001-955) 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 using a Primary Authorized Worker (PAW) to perform a field walkdown, refer to Section 5.10.2.

If using a PAW to perform a Safe-To-Work Check, refer to Section 5.10.3.

Actionee	*Step*	*Action*
COA	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. 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: • 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, communicate with the COA for resolution. • If the AW would be exposed to unacceptable hazards (e.g., high radiation conditions, confined spaces) while performing a field walk down, a job specific instruction is written in the work instruction, approved by the Safety organization and the COA, with agreement from the AW. The instruction will provide justification for no walkdown or an alternate method of identifying boundaries. • Verify the information on AW tag is complete and legible.

Actionee	Step	Action

- Over lock/tag the CO lock(s)/tag(s), OR if a lockbox is used, verify that all the keys and/or equivalent protection indicator are in the lockbox and 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.

   NOTE: *If using a Primary Authorized Worker to perform a Safe-To-Work Check is justified, refer to Section 5.10.3.*

   Methods used to perform Safe-To-Work checks include one or more of the following:

   - Attempt to restart.
   - 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 the Safe Condition Check performed by the COQW. The AW is responsible for performing his/her own Safe-to-Work Check in accordance with the criteria above.

   NOTE: *A voltage check is always required for electrical work. In the case where the hazardous energy is mechanical with an electrical motive force, an AW can request a voltage check on the electrical powered component.*

4. Perform the work.

5. When the AW is ready to remove the AW lockout/tagout:

   a. Determine it is safe to remove the AW lockout/tagout.

   b. Remove the AW lockout/tagout. Each AW removes only their own locks and Danger tags except as allowed by Section 5.10.1.

   c. 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 TAF will be in the possession of the person removing the tag(s). If conditions warrant, an up-to-date copy of the TAF can be used provided the original is signed promptly after leaving the area.

Actionee	*Step*	*Action*
COA	1.	Review of work document(s).
		a. Verify work task(s) supported by the TAF are complete.
		b. Verify system configuration supports lock and tag removal.
		c. Verify all AW locks are removed.
		d. Determine lock and tag is safe to be removed.
	2.	Approve removal of tag(s) as follows: • Sign and date in TAF Block #12 that the tag(s) in Block #7 are no longer applicable. • Sign and date removal approval in TAF Block #28. • Identify Restoration Position /Condition in TAF Block # 29. • Refer to special instructions in TAF Block #14 for removal instructions, if applicable.
COQW (Remover)	3.	Ensure that affected personnel are safely positioned or removed from the area prior to re-energizing equipment.
	4.	Remove lock and tag in accordance with TAF. **NOTE:** *Refer to Block #14 for any special instructions.*
	5.	Restore component position as specified in TAF Blocks #29.
	6.	Sign and date TAF Block #30 for each tag removed.
	7.	Return TAF and tag(s) to the COA or as directed.

COA	8.	Complete lock and tag removal as follows: • Verify correct locks/tags have been removed. • Notify affected worker(s). • Destroy tags.
	9.	Ensure the completeness and accuracy of all data recorded.
	10.	Enter date closed 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 is considered adequate, when documented. • If the AW cannot be contacted, the AW's management can direct removal of the lock.
Manager/ Supervisor and COA	3.	If it is determined that the lock should be cut off, then the AW's supervisor, or designee, and a person from the CO must 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 the AW's return to work.

5.7 Procedure for Partial Clearance of Tags

NOTE: *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.*

Actionee	*Step*	*Action*
COA(Preparer)	1.	Indicate the reason for partial clearance in TAF Block #15. Enter tag number(s) and justification.
	2.	Re-enter information in TAF Block#6.
	3.	List applicable tag(s) for new lockout/tagout boundary in TAF Block #7.
	4.	Enter summary of work to be performed or the basis for the tags in TAF Block #8.
	5.	List the personnel hazard(s) that require the lockout/tagout in TAF Block #9.
	6.	Sign and date TAF Block #10 to signify that the lockout/tagout boundary and paperwork is 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) **NOTE:** *Work may need to be suspended and associated AW locks removed to accommodate lockout/tagout partial clearance.*
COA	8.	Proceed to Section 5.5 to clear tag(s).

5.8 Replacement/Addition of Tags

This section covers the process for replacement of missing, mutilated, or addition of tags. If lockout is intact, a second Safe Condition Check is not necessary.

Actionee	*Step*	*Action*
COA(Preparer)	1.	Document reason for addition of tag(s) in TAF Block #15.
	2.	Complete TAF Blocks #6 through 9, as applicable. • Re-enter information in TAF Block #6. • Enter tag numbers applicable to the individual work authorization/procedure/step number in TAF Block #7.

Actionee	*Step*	*Action*

- Enter summary of work to be performed or the basis for the tags in TAF Block #8.

- List the personnel hazard(s) that require the lockout/tagout in TAF Block #9. (e.g., electrical, mechanical, hydraulic, chemical, radiation, thermal, potential etc.)

3. Complete TAF Blocks #19 through 23, 31 and 32 for added tag(s).

   - Enter the sequential number of the tag; (i.e., 1, 2, 3) in TAF Block #19.

   - Enter a clear, specific description that uniquely identifies each component to be tagged in TAF Block #20. (Includes one or more of the following: facility specific identification number, name, nameplate information, etc.)

   - Enter the location of the component in TAF Block #21.

   - Enter the lock number in TAF Block #22 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.

   - Enter the required position/condition of the component in TAF Block #23. Use clear/concise terms that appear on the component indicator, when present.

   - Enter the number(s) of the tag(s); (e.g., 1, 2, 3, 4-7) in TAF Block #31.

   - Enter the Safe Condition Checks in Block #32.

4. Add any special instructions in TAF Block #14 (e.g., alternate means of protection or special installation instructions)

5. Prepare the tags to be used (*Danger Do Not Operate Tag*, 37-8350-035, 37-8350-036*). The information on the tags shall match the information on the TAF. See Appendix B for directions, if needed.

   NOTE: *Asterisk denotes small tag for use where large tag cannot be used.*

Actionee	Step	Action
	6.	Sign and date TAF Block #10 to signify that the lockout/tagout boundary and paperwork is 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)
	8.	Proceed to tag installation in Section 5.3. **NOTE:** *Work may need to be suspended and associated AW locks removed to accommodate lockout/tagout addition.*
	9.	When new tags have been added, sign and date in TAF Block #12 stating that the previous lockout/tagout boundary in Block #7 is no longer applicable. **NOTE**: *For previously installed tags that need to be replaced (e.g., missing, mutilated, etc.), the process to partially clear the tag(s) is completed per Section 5.7.*

5.9 Authorized Worker Locks and Tags Alone Using the Eight Criteria

The eight criteria are listed in Step 5.2.1.
Use the Eight Criteria Checklist (A-6003-801) when performing work in this section.
Instructions for use are contained on the Checklist.

Actionee	Step	Action
COA	1.	Identify energy isolation point. Complete the Eight Criteria Checklist (A-6003-801). **NOTE:** *This checklist does not authorize work to begin. Follow the normal work control process for the facility/location where you will be working.*
COA and AW	2.	Verify and concur the identified energy isolation point is correct. **NOTE:** *The CO and AW must agree to using the eight criteria or a CO Lockout/Tagout will be used.*
COA/Supervisor	3.	Conduct a lockout/tagout pre-installation brief with AW(s) covering 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.

Actionee	*Step*	*Action*
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). • A Safe-to-Work Check per Step 5.9.9 can be performed at this time if the locking device will prevent performance after installation.
	7.	Ensure component is in the required position.
AW	8.	Securely attach the lockout device and completed Danger Tag, 54-6001-955 at the same point. Each AW installs ***only*** their own lock and Danger Tag except as allowed by Section 5.10.1.
	9.	Perform or witness a Safe-to-Work Check: • Prior to the start of work. • Once per shift. • If the configuration has changed. Methods used to perform Safe-To-Work checks include one or more of the following: • Attempt to restart. • Use of instrumentation. • Use of any other appropriate methods to assure energy control. **NOTE:** ***A voltage check is always required for electrical work. In the case where the hazardous energy is mechanical with an electrical motive force, an AW can request a voltage check on the electrical powered component.***
	10.	Perform work.
	11.	Determine that it is safe to remove the AW lockout device. • Ensure that personnel are safely positioned or removed from the area prior to re-energizing equipment.
	12.	Remove AW lockout device. Each AW removes ***only*** their own locks and Danger tags except as allowed by Section 5.10.1.

Actionee	Step	Action
	13.	Notify the COA, either directly or through the field work supervisor, that the AW lockout/tagout is removed.
COA	14.	Notify affected workers when lockout/tagout is removed.

5.10 Exceptions

5.10.1 AW Lock Removal/Reinstallation

Actionee	Step	Action
AW	1.	Perform the initial application of the AW Lock. However, 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 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, etc.).
		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. **NOTE:** *Each authorized worker has the right to verify the lockout/tagout Boundary(ies) if they so choose.*
Work Crew	2.	Designate the Primary Authorized Worker(s).
PAW	3.	Perform a field walk down of the identified boundaries and install the over lock and tag as follows: • Install PAW's AW lock prior to or following field walkdown. • Verify CO lock(s)/tag(s) are hanging on the required

Actionee	Step	Action
		component (s). • Verify components are in the required position(s)/condition(s). When component position cannot be verified, communicate with the CO for resolution. • Over lock/tag the CO lock(s)/tag(s), OR if a lockbox is used, verify that all the keys and/or equivalent protection indicator are in the lockbox and then overlock and tag the lockbox.
Supervisor or PAW(s)	4.	Communicate to the work crew that the lockout/tagout is in place.
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), OR if a lockbox is used, over lock/tag the lockbox.
	6.	Proceed to Section 5.4, Step 3.

5.10.3 Using a Primary Authorized Worker Safe-to-Work Check

Actionee	Step	Action
COA/Manager	1.	Authorize a PAW to perform a Safe-to-Work Check when additional safety hazards exist due to nature of work if the following conditions are met: • Written justification (work package comments, pre-job sheet, etc.) is obtained from the COA and agreed to by the workers. **NOTE:** *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.

4. Methods used to perform Safe-To-Work checks include one or more of the following:

   - Attempt to restart.
   - 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 PAW observed the safe condition check performed by the COQW.

   NOTE: ***A voltage check is always required for electrical work. In the case where the hazardous energy is mechanical with an electrical motive force, an AW can request a voltage check on the electrical powered component.***

Supervisor or PAW

5. Communicate to the work crew that the Safe-To-Work Check is complete.

6. Proceed to Section 5.4, Step 4.

5.10.4 Adding Work Packages to a Previously Installed LOTO

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 the worker's safety. **NOTE:** *Each Work Authorization/Documentation might not necessarily 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, and/or a field walkdown). • Refer to Appendix C for hazardous energy isolation controls. • The facility specific identification number 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, etc.) If no drawing is available, use whatever

Actionee	Step	Action
		means necessary to determine the correct identification with concurrence from system subject matter expert.
		3. Ensure that the existing LOTO boundary and safe condition check(s) are adequate for the work scope and incorporates at a minimum all of the 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 might 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 block. • Add the identification of all applicable control drawings, drawing change documents, and/or other methods used to establish isolation boundaries in TAF Block #4, as necessary. • Enter additional lockbox information in TAF Block #5, as required. • Enter all work authorizations or procedure numbers or step numbers in TAF Block #6 that are pertinent to this lockout/tagout and consistent with the reason for tagging identified in TAF Block #8. • Enter tag numbers applicable to the work authorization/procedure in TAF Block #7, including additional tag numbers if required. • Enter summary of work to be performed or the basis for the tags in TAF Block #8. • List the personnel hazard(s) that require the lockout/tagout in TAF Block #9. • As required update or enter additional special instructions such as: sequence of tag removal in TAF Block #14. • As required update or enter additional safe condition

Actionee	*Step*	*Action*

checks in TAF Block #32. Specify that the additional safe condition check is new by designating as: "(NEW)"

5. If additional tags are required to establish a safe boundary perform the following, otherwise proceed to Step #6:

   - Enter the tag number(s) (e.g., 1, 2, 3) in TAF Block #13, as necessary.
   - 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., in TAF Block #14.
   - Document reason for addition of tag(s) in TAF Block #15.
   - Enter the sequential number of the tag (i.e., 1, 2, 3) in TAF Block #19.
   - Enter a clear, specific description that uniquely identifies each component to be tagged in TAF Block #20. (Includes one or more of the following: facility specific identification number, name, nameplate information, etc.)
   - Enter the location of the component in TAF Block #21.
   - Enter the lock number in TAF Block #22 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 an alternate method of equivalent protection is required, enter "See Block #14".
   - Enter the required position/condition of the component in TAF Block #23. Use clear/concise terms that appear on the component indicator when present.
   - Enter the sequential number of the tag (i.e., 1, 2, 3) in TAF Block #31.
   - Enter the Safe Condition Checks in Block #32.

Actionee	*Step*	*Action*
		• Prepare the tags to be used (*Danger Do Not Operate Tag,* 37-8350-035, 37-8350-036*).
		NOTE: *Asterisk denotes small tag for use where large tag cannot be used.*
		The information on the tags shall match the information on the TAF. See Appendix B for directions, if needed.
	6.	Sign and date TAF Block #10 to signify that the lockout/tagout boundary and paperwork is adequate and accurate for the task.
COA (Tech Reviewer)	7.	Sign and date TAF Block #11 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 (ECNs), facility modification packages (FMPs), approved sketches, field walkdowns 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 tags (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.
		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 DDNO tags.

Actionee	*Step*	*Action*
		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.	Sign and date the "(NEW)" Safe Condition Check in TAF Block #32.
COA/Supervisor	13.	Proceed 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 can 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 or mutilated at the time of the surveillance, see Section 5.8.
	4.	Initial and date TAF Block #16 for the completion of the surveillance in TAF Block #16 on each TAF reviewed.

5.12 Hazardous Energy Control Periodic Review

Actionee	*Step*	*Action*
Individual Contractor Safety Organization	1.	Issue annual review requirement letter and lines of inquiry.
COA	2.	Make arrangements with AW qualified person that is 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 in the facility.
COA/ COQW	3.	Perform a walk down of 100% of the installed TAFs (This step can 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 the results of the review.
Training	6.	Provide AWs the opportunity to provide 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 Safety Organization	7.	Complete the following: • Review the data for trends and common problems for the site. • Provide follow-up information to the facilities as appropriate. • Provide any unresolved comments received to the Hanford Site Lockout/Tagout Committee (see Charter).

5.13 Outside Contractors (including vendors and service providers)

For purposes of this procedure, an outside contractor is defined as anyone that is not an employee of a Hanford Prime Contractor Team.

The outside contractors and controlling organization will perform lockout/tagout activities in accordance with this section of the procedure. If the work being performed meets the exceptions of Section 5.10, refer to that section for applicable criteria.

This section does not apply to greenfield construction for such construction workscope with no physical interface to an existing facility the constructor/subcontractor will be designated as the CO and required to follow the Hanford Site Lockout/tagout program in its entirety.

Actionee	*Step*	*Action*
COA	1.	Designate a qualified member(s) of the CO to be the lockout/tagout point of contact for the outside contractor for facilities that have a physical interface with an existing facility.
	2.	Determine which of the following methods of lockout/tagout 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 that energy source will completely de-energize and deactivate the equipment, 4. The equipment is isolated from that 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 lockout device in the possession of the AW), 7. The servicing or maintenance does not create hazards for other workers, ***and***

8. The employer, in utilizing this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

3. Ensure the outside contractor personnel have successfully completed applicable *Lockout /Tagout* training.

   NOTE: *The 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.*

4. If the eight criteria method is selected, go to Step 5.13.11.

5. If the CO method is used prepare and issue a TAF according to Steps 5.2.3 through 5.2.8 and Section 5.3.

6. Escort outside contractor personnel where the work activities will be performed.

   NOTE: *It is acceptable to arrange to meet at the work location.*

7. Perform the following:

   - Ensure the TAF is complete (tags have been installed, independently verified, and Safe Condition Checks are complete).
   - Ensure the outside contractor AWs are aware of the following:
     - Energy isolation boundaries.
     - Any special methods used for energy control.
     - AW locks must be green.
   - Provide an up-to-date copy of the TAF to the outside contractor AW.

8. Accompany outside contractor AW while they:

   a. Perform a field walk down of the identified boundaries and installs the AW lockout/tagout 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, communicate with

the COA for resolution.

- If the outside contractor AW would be exposed to unacceptable hazards (e.g., high radiation conditions, confined spaces) while performing a field walk down, a job specific instruction is written in the work instruction, approved by the Safety Organization and the COA, with agreement from the outside contractor AW. The instruction will provide justification for no walkdown or an alternate method of identifying boundaries.

- Verify the information on outside contractor AW tag is complete and legible.

- Install AW lock/tag over the CO lock(s)/tag(s), **OR** if a lockbox is used, verify that all the keys are in the lockbox and then over lock and tag the lockbox.

Outside Contractor AW

b. Perform or witness a Safe-to-Work Check:

- Prior to the start of work.
- Once per shift.
- If the configuration has changed.

Methods used to perform Safe-To-Work checks include one or more of the following:

- Attempt to restart.
- 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. The outside contractor AW may observe the safe condition check performed by the COQW, but is responsible for performing his/her own Safe-to-Work Check in accordance with the criteria above.

NOTE: ***A voltage check is always required for electrical work. In the case where the hazardous energy is mechanical with an electrical motive force, an AW can request a voltage check on the electrical powered component.***

9. Perform the work.

10. Complete Steps 5.13.21 thru 5.13.26.

COA	11. Identify energy isolation point. • Complete the Eight Criteria Checklist (A-6003-801). **NOTE:** *This checklist does not authorize work to begin. Follow the normal work control process for the facility/location where you will be working.* 12. Escort outside contractor personnel where the work activities will be performed. **NOTE:** *It is acceptable to arrange to meet at the work location.*
COA and Outside Contractor AW	13. Verify and concur the identified energy isolation point is correct. **NOTE:** *The COA and AW must agree to using the eight criteria or a CO Lockout/tagout will be used*
	14. Determine that it is safe to shut down the system.
COA	15. Notify affected workers of intent to de-energize equipment.
COQW, AW, or Outside Contractor AW	16. Shutdown or otherwise de-energize the equipment by relieving, disconnecting, restraining, or otherwise rendering safe any stored or residual energy. • An outside contractor AW performing the work may observe the initial shutdown of the system/equipment (e.g., loss of power). 17. Place component in required position. • A Safe-to-Work Check per Step 5.13.19 can be performed at this time if the locking device will prevent performance after installation.
Outside Contractor AW	18. Securely attach the lockout device and completed Danger Tag, 54-6001-955 at the same point. Each outside contractor AW installs ***only*** their own lock and Danger Tag. • Verify the information on Outside Contractor AW tag is complete and legible.

19. Perform or witness a Safe-to-Work Check:

    - Prior to the start of work.
    - Once per shift.
    - If the configuration has changed.

    Methods used to perform Safe-To-Work checks include one or more of the following:

    - Attempt to restart.
    - Use of instrumentation.
    - Use of any other appropriate methods to assure energy control.

    NOTE: *A voltage check is always required for electrical work. In the case where the hazardous energy is mechanical with an electrical motive force, an AW can request a voltage check on the electrical powered component.*

20. Perform work.

Outside Contractor AW

21. Notify the COA, either directly or through the field work supervisor, that the outside contractor AW lockout/tagout is ready for removal.

COA and Outside Contractor AW

22. Report to the work location and determine that it is safe to remove the outside contractor AW lockout device.

    - Ensure that personnel are safely positioned or removed from the area prior to re-energizing equipment.

COA

23. Authorize the outside contractor AW to remove their lockout device.

    NOTE: *If outside contractor AW is not available to remove their lockout device refer to Section 5.6.*

Outside Contractor AW

24. Remove locks and Danger tags.

COA

25. Notify affected worker(s) when lock and tag is removed.

    NOTE: *If performing eight criteria work, Step 5.13.26 does not have to be performed.*

26. Clear the CO lockout/tagouts per Section 5.5.

6.0 FORMS

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 are 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*
HNF-PRO-066, *Electrical Utilities Lock and Tag Program*
NFPA 70E, Section 120, *Working on or Near Energized Electrical Conductors or Circuit Parts that have Lockout/Tagout Devices Applied*
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 authorized worker lock and/or danger tag on a lockbox, or an isolation component(s) for machines, equipment, or systems to perform servicing or maintenance on that machine, 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 contractual responsibility for assigned project outcomes
Controlling Organization	The organization responsible for establishing and maintaining isolation boundaries associated with the work to be performed.
Controlling Organization Administrator	Individuals designated by Controlling Organization management and trained to perform TAF preparation, technical review, or authorization. The COA is trained to the same level as a COQW and may perform assigned activities as a COQW.
Controlling Organization Qualified Worker	Individual designated by Controlling Organization management and trained to perform CO lockout/tagout installation, independent verification, and removal.

	A COQW also performs or witnesses Safe Condition Check as part of lockout/tagout installation.
Danger-Do-Not-Operate Tag (DDNO)	The tag used by controlling organizations to perform hazardous energy or hazardous material lockout/tagouts. This tag, and its use, is specific to the controlling organization. No servicing or maintenance may be performed under this tag unless a Danger tag has been installed by an authorized worker either as an overlock or on a lockbox.
Danger Tag	The tag used by authorized workers to perform authorized worker lockout/tagout. This tag is for the personal protection of the authorized worker who is performing servicing or maintenance under this tag.
Durable Hardware	(*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 or Bakelite™ 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. This ensures freedom of thought.
Installed	A CO lockout/tagout is considered installed after it 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 the servicing and maintenance is 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 to operate (not a combination lock) and holds a component in the required position for the protection of personnel. Locks used under the guidance of this procedure are to be singularly identified by color, shape, or size and shall only be used for lockout/tagout.
Lockbox	A specifically identified and job-specific container or device used in group lockout activities which is capable of being locked, and in which keys and equivalent protection indicators used to control the components (e.g., hand wheels, fuses, tagout forms) used in group lockout isolations are stored and controlled by attachment of AW personal locks.
Lockout	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 a machine or 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 a machine or equipment to perform its intended production function.

Overlock/Overtag Installation of a lockout/tagout on top of another lockout/tagout. Examples are:

- The installation of a lock and Danger tag by an authorized worker on top of the controlling organization's lock and Danger-Do Not-Operate Tag
- The installation of a controlling organization 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 person knowledgeable on the machine, equipment, or system being tagged and has been designated to prepare the Tagout Authorization form.

Primary Authorized Worker A member of the work crew designated with the responsibility to verify for a group of authorized workers that the boundary isolation steps taken have in fact isolated the machine or equipment effectively from the employees. The primary authorized worker 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	Can easily be determined (based on review of previous documentation i.e., TAF) or distinguished (visual confirmation) to be the correct component for the equipment or system to be serviced; and the single source of energy is positively known to be accurate, by both the controlling organization and authorized worker.
Remover	The controlling organization 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 the authorized worker performs to ensure that no hazardous energy exist where they 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 machines or 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 Hardware	*(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 machine, equipment or system and has been designated to perform the independent technical review of a lockout/tagout.
Verifier	The COQW that independently verifies that the lockout/tagout have been installed correctly.
Work Crew	All authorized workers 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), Tagout Authorization Forms, 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.	Obtain the next sequential number from the *Tagout Index* (A-6000-514). Enter this number in Block #1 and on all additional pages of the TAF.
2.	Enter page number in Block #2.
3.	Enter the system name, number, or abbreviation in Block #3.
4.	Enter the identification of all applicable control drawings, drawing change documents, and/or other methods used to establish isolation boundaries in TAF Block #4.
5.	Enter lockbox information in Block #5.
6.	Enter in Block #6 work authorization(s)/procedure number(s) that is pertinent to this lockout/tagout and consistent with the reason for tagging identified in Block #8. • Enter work authorization(s) or procedure number(s) or step number in TAF Block #6 that are pertinent to this lockout/tagout and consistent with the reason for tagging identified in TAF Block #8. • N/A or TBD this block if no work authorization/procedure applies.
7.	Enter in Block #7 tag numbers applicable to the work authorization/procedure. • This block should show all current tags providing the lockout/tagout boundary for the lockout/tagout (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 here.
8.	Summarize in Block # 8, 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 in Block #9. 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 originator of the TAF signs Block #10 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" ***may 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 Block #11 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" ***may not*** sign for "prepared by".
12.	Determine if the task(s) requiring the lockout/tagout boundary is complete. • Verify the task(s) supported by the tag(s) are complete. • Verify system configuration supports lock and tag removal. • Verify all required AW Locks are removed. • Determine lock and tag is safe to be removed. Sign Block #12 for each line as if it is stand alone. Each set of tags independently supports the work.
13.	Enter all tag numbers in Block #13.
14.	Enter in Block #14, 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 "NA" for tags not requiring special instructions. If the verification can not 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) in Block #15.
16.	Document surveillance periodicity in Block #16. Use the *Lock And Tag Surveillance Checklist* (Site Form A-6003-747) for the surveillance. • Initial the block and enter the date when the surveillance is complete. • Retention of the checklist is in accordance with Section 7.0.
17.	Enter the Lockout/Tagout number (from Block #1) in Block #17, and on all additional pages of the TAF.
18.	Enter the page number in Block #18.
19.	Enter in Block #19, the sequential number of the tag; e.g., 1, 2, 3.
20.	Enter in Block #20, 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 always 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 in Block #21, the location of the component (e.g., room, building number, system, etc).
22.	Write lock number in Block #22. The lock number may be filled in at the time of installation. Enter "**N**" if no lock is required. If an alternative method of equivalent protection is to be used, enter "See Block #14." Enter equivalent method information in Block #14.
23.	Enter the required position/condition in Block #23. 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 you are ready to authorize tags to be hung: • 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 Block #24 for each tag and sign "authorized by" on each tag.
25.	Ensure the following: • TAF and tag is 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 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 in Block #25.

26.	Verify the following: • TAF and tag is 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 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 in Block #26.
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 in Block #27, for each tag identified in Block #19.
28.	When Block #28 is 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: • All AW Locks removed. • System configuration supports lockout/tagout removal.
29.	Enter in Block #29, 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 the TAF in Block #30. • Return TAF and tag(s) to the COA or as directed.

31.	Enter in Block #31, the number(s) of the tag; e.g., 1, 2, 3.
32.	Enter in Block #32, the Safe Condition Check instructions, or the step of the work document describing the safe condition check (e.g., methods, location, etc.). Consider the entire lockout/tagout boundary when determining the safe condition check. 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. Additional checks are allowable at the component, when desired or deemed necessary. **NOTE:** *Reference previous safe condition check for missing or mutilated 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 in block #32 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. Listing where the tag(s) are being placed is not required.
3.	Enter the date that the lockout/tagout was installed.
4.	Enter the date that all installed tag(s) were removed and the TAF is 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 that facility personnel know where to find it.
Lock No.	Enter information from TAF Block #22.
Authorized by:	Signed and dated by COA. Use the criteria listed in the directions for completing TAF Block #24.

Installed by:	Ensure the following: • TAF and tag is authorized for installation. • The correct component is in the position specified in TAF Block #23. • If applicable, ensure any special instructions for installation are met. • Ensure visually and physically that the lockout device is adequately installed to prevent inadvertent operation of the component. • Secure the tag. After ensuring the items above: • Sign and date the tag. • Sign and date the TAF Block #25.
Verified by:	Independently verify the following: • TAF and tag is authorized. • The correct component is in the correct position specified in Block #23. • If applicable, ensure any special instructions for installation are met. • The lock (as required) is installed correctly. • The tag is installed securely. • Ensure visually and physically that the lockout device is adequately installed to prevent inadvertent operation of the component. • The lock number matches Block #22. • 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 Block #26.

APPENDIX C
Hazardous Energy Isolation Controls

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

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 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 and tag out electrical circuit breakers, switches, disconnects, hot leads, or other devices that provide isolation to the area to be worked from all sources of electrical energy. If possible, visually ensure contacts of disconnect switches are disengaged. 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, etc., 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 must 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.

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 1.0.6 of this Appendix.

2.0 ISOLATING ROTATING OR MOVING EQUIPMENT

NOTE: *Section 1.0 above is not required in addition to this section if the Safe Condition Check in this section ensures the safety of the worker.*

1. Isolate lock and tag out the main power disconnects for working on rotating equipment. If a disconnect is unavailable or is in the work scope, use the next upstream power supply (breaker).

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. Lock and tag out the blocking or securing devices in place.

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 the direct 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 will be locked-out/tagged-out.

Use the following method:

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

2. If a normal depressurization path cannot be provided within the lockout/tagout boundary, use 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.).

NOTE: *If there is no normal depressurization path, a written work plan is used to achieve a depressurized condition.*

3. 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.

4. 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.

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 series (“two-valve protection”) to provide isolation from the

fluid. Apply the requirements for two-valve protection to all paths from which the fluid could cross the lockout/tagout boundary.

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

2. 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 can be done with single-valve isolation.)

3. 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 will be approved by Occupational Safety & Health 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.

4. A lockout/tagout is installed on an open atmospheric drain or vent between the valves to depressurize the equipment and to accommodate thermal expansion or contraction. If this cannot be achieved, refer to procedure Step 5.2.3, bullet 1.

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) will 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. Position Verification. If such position cannot be determined, or if isolation/deenergization cannot otherwise be verified, work should be stopped and the COA (Authorizer) should be notified.

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

1.1 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.

1.2 Testing of Deenergized Electrical Circuits

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 deenergized, 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. Additional checks are allowable at the isolating device, when desired or deemed necessary.

6. If electrical safe condition checks are not performed at the physical work location(s), and the safe-to-work check(s) cannot be performed at the component or on the equipment where the exposure to electrical energy could occur, then the job will be treated as energized and company energized work program shall be followed until absence of voltage can be verified.

2.0 Safe Condition Checks for Rotating and Moving Equipment

NOTE 1: ***A voltage check is always required for electrical work. In the case where the hazardous energy is mechanical with an electrical motive force, an AW can request a voltage check on the electrical powered component.***

NOTE 2: *Either Step 2.1* ***or*** *Step 2.2* ***or*** *both are performed depending on the hazard identified.*

2.1 After the lockout/tagout is installed, 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.

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

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

3.1 Vent(s) and/or drain valve(s) are monitored after the lockout/tagout is installed and during the remainder of the tagout process to verify system pressure is released.

3.2 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 exists. Strict supervisory control and advance planning are required if these methods are used.

3.3 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.”