



Hazardous Energy Control (Lockout/Tagout) for Gas Clearances

Procedure

TD-4441P-20, Rev. 0a
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Effective Date: 03/01/2016



Summary

This utility procedure provides direction for applying layers of protection for personnel safety while isolating hazardous energy during a gas clearance, including tags, locks, and other means of preventing operation of isolated equipment. This procedure also provides direction on managing the keys to any locks/locking devices, to ensure locks remain in place until the clearance supervisor and all other authorized personnel deem it safe to remove them.

LEVEL OF USE: Informational Use



Target Audience

All personnel who perform work, or provide support for work, on PG&E natural gas transmission or distribution systems and associated equipment including but not limited to:

- Gas control center (GCC) personnel (gas transmission control center [GTCC] and gas distribution control center [GDCC])
- Maintenance and construction (M&C) personnel
- Gas pipeline operations and maintenance (GPO&M) personnel
- General construction (GC) personnel
- Pipeline field services personnel
- Gas construction contractors
- Gas transmission engineering and design (GTE&D) and gas distribution engineering and design (GDE&D) personnel
- Quality control (QC) and quality assurance (QA) organizations supporting field employees

For information only, the following personnel need to be aware of this procedure:

- Asset and risk management personnel
- Gas storage asset management personnel
- Project management and major programs personnel
- Process excellence personnel
- Process safety personnel
- Transmission and distribution mapping personnel
- Gas estimators in customer service delivery (CSD; electric operations)



Safety

Personal injury may occur when performing work on facilities that normally carry and/or operate with hazardous energy if that energy is not adequately controlled.



Before You Start

Supervisor confirms that personnel:

- Demonstrate competency and skills required to perform the work.

Personnel:

- Receive appropriate training as indicated in [Utility Standard TD-4441S, "Gas Clearances."](#)
- Gather appropriate personal protective equipment (PPE) following safe work practices. Use additional PPE as required for the work performed per the specific procedure.



Operator Qualification (OQ) Requirements

There is no specific OQ for performing the steps in this procedure (e.g., tagging, locking). However, tasks performed in executing a clearance may require OQs (e.g., turning valves or operating squeezers).



Quality Control (QC) and Quality Assurance (QA)

Quality Control

The following QC verification points are used during field observations by the supervisor in the various lines of business that perform this work:

- Valid OQ for personnel performing task
- Proper tag used
- Tag completed properly
- Proper lock process followed

Quality Assurance

The following QA assessments evaluate conformance during annual randomized schedule which complies with state and federal regulations:

- Valid OQ for personnel performing task
- Authorized personnel understand responsibilities under lockout/tagout
- Proper tag used
- Tag completed properly
- Proper lock process followed



Tools and Equipment

Tools and equipment required to perform work in this procedure include, but are not necessarily limited to, the following (see [Attachment 1, “Man-on-Line, Caution, and Information Tags”](#) and [Attachment 2, “Locks, Lockboxes, and Locking Devices,”](#) for ordering information):

Tags

- Man-on-Line (MOL)
- Caution
- Information

Tools for completing and removing tags

- Ties that meet the characteristics described in [Section A](#)
- Permanent markers
- Diagonal cutters for removing ties

Locks

- Device (red) and/or other locking devices
- Personal (green)
- Contractor (black)

Lockboxes

- Main lockbox
- Satellite lockboxes



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Overview: Lockout/Tagout for Gas Clearances

This utility procedure provides direction for applying layers of safety while isolating hazardous energy during a gas clearance. Isolation of energy sources, such as gas, electrical, chemical, mechanical, hydraulic and pneumatic, is required.

All isolation points have at least three layers of protection for personnel safety:

- The energy isolation itself (e.g., closing a valve or squeezing pipe)
- A Man-on-Line (MOL) tag placed in a prominent position
- An additional layer of protection associated with the equipment isolating the energy (e.g., locking a valve or monitoring the equipment). See [Job Aid TD-4441P-20-JA01, "Isolation Devices and Locking Requirements,"](#) for details.

PG&E must provide personnel with approved locks, tags and other hardware required to implement this procedure. These locks and tags may not be used for any other purpose. See [Attachment 1](#) and [Attachment 2](#) for ordering information.

- **Device locks** are red locks (or other locking devices) used to secure equipment at isolation points. Device locks may be individually keyed (i.e., one key opens one lock) or keyed by set (i.e., one key opens all locks in a set), but each device lock must open for one and only one key.
- **Personal locks** are green locks provided to each employee who may work in areas that may require hazardous energy isolation. The number of locks provided to an employee may vary depending on the nature of the employee's work. Personal locks may be individually keyed (i.e., one key opens one lock) or keyed by set (i.e., one key opens all locks in a set), but each personal lock must open for one and only one key.
- **Contractor locks** are black locks provided for contractors to lock onto lockboxes (**NOT** PG&E equipment). If contractors supply their own locks, those locks must either be black, or be wrapped with black tape. Each contractor lock must open for one and only one key.

[Attachment 3, "Example Scenarios,"](#) illustrates possible hazardous energy control (lockout/tagout) situations.

Section A. Isolating Hazardous Energy

This section provides instructions for isolating hazardous energy for personnel safety, including attaching tags, affixing locks, and applying additional layers of protection. Examples of additional layers of protection (as described in [TD-4441P-20-JA01](#)) include, but are not limited to, the following:

- Physical lock or locking device
- Manned stand-by throughout clearance
- Removal of parts necessary for operating equipment (such as handles)
- Other means of reducing the possibility of accidental operation


The clearance supervisor is accountable for the acquisition, completion, and placement of all tags and device locks, even if the tasks are delegated to other personnel.

1. The clearance supervisor (or their delegate) obtains the tags and isolation equipment required for the clearance being performed.
2. Follow these tagging rules:
 - A. The clearance supervisor (or their delegate) ensures tags are completely and correctly filled out, and correspond to the operational steps listed in the “Gas Clearance Document.” Tags can be completed with permanent markers, or tag labels can be printed out from SAP with information already provided.
 - B. The clearance supervisor (or their delegate) attaches tags in a position that anyone attempting to operate the tagged equipment will encounter prior to operation. The device for attaching tags (e.g., a zip tie) must meet the following criteria:
 - Non-reusable
 - Attachable by hand
 - Self-locking
 - Non-releasable, with a minimum unlocking (breaking) strength of 50 lb.
 - The general design and basic characteristics must be at least equivalent to a one-piece, UV-rated, all-environment-tolerant, nylon cable tie.
 - C. **DO NOT** remove tags or operate tagged equipment except in accordance with the following:
 - 1) For MOL tags, follow the processes described in [Section C](#) and [Section D](#) for removing locks.
 - 2) For Caution tags, obtain authorization from the clearance supervisor before operating tagged equipment.
 - In an emergency situation, if the clearance supervisor is not available to authorize operating equipment tagged with a Caution tag, obtain authorization from the responsible superintendent or Gas Control.
3. Perform actions described in [Table 1, “Tags and Additional Layers of Protection,”](#) while executing the clearance.

Section A (continued)

Table 1. Tags and Additional Layers of Protection

AT THIS TYPE OF LOCATION	PERFORM THESE ACTIONS
Isolation Point	<ol style="list-style-type: none"> 1. Operate/manipulate equipment/tools as necessary for the execution of the clearance at this point (typically indicated in the “Gas Clearance Document” Sequence of Operations Tagging List). 2. OPTIONAL: Have a second person independently verify that the isolation point correctly aligns with the clearance (e.g. valve is in the correct position). 3. Attach an MOL tag. 4. Apply an appropriate additional layer of protection (as described in TD-4441P-20-JA01) and verify that the protection works as intended (e.g., prevents the valve from turning or the equipment from operating). <ul style="list-style-type: none"> • If the additional layer of protection includes a device lock, document the device lock number on the Gas Clearance Document Sequence of Operations. 5. OPTIONAL: Attach an Information tag if desired, but only in addition to (never in place of) the MOL tag.
Clearance Point	<ol style="list-style-type: none"> 1. Operate/manipulate equipment/tools as necessary for the execution of the clearance at this point (typically indicated in the Sequence of Operations Tagging List). 2. Attach a Caution tag. 3. OPTIONAL: Attach an Information tag if desired, but only in addition to (never in place of) the Caution tag.
Gauge Point/Tap	<ol style="list-style-type: none"> 1. OPTIONAL: Attach an Information tag if desired (no tag is required).

	<p style="text-align: center;">NOTE!</p> <p>Any person performing work under the protection of a clearance has the right to personally verify that the clearance area is safe to perform work.</p>
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4. Verify clearance area is safe to perform work.
5. If any isolation point’s additional layer of protection includes a device lock, secure keys in the main lockbox as described in [Section B](#).

Section B. Securing Keys to Device Locks

If no isolation points are secured with device locks, this section does not apply (skip to [Section C](#)).

This section provides instructions for clearance supervisor and all other authorized personnel to prevent access to the device lock keys until the clearance supervisor and all other authorized personnel agree it is safe to retrieve the keys and remove the device locks.

The clearance supervisor puts the device lock keys in a lockbox (known as the main lockbox). The main lockbox is then secured by the personal and/or contractor locks of the clearance supervisor and other authorized personnel ([Section B1](#)).

If any authorized personnel cannot use the main lockbox for any reason, one or more additional lockboxes (known as satellite lockboxes) are used to control access to the device lock keys as described below ([Section B2](#)).

B1

Using the Main Lockbox

The main lockbox (per [Attachment 2](#)) contains keys to all device locks deployed in the work area. It is secured by the personal lock of the clearance supervisor and the personal locks and/or contractor locks of the other authorized personnel. Therefore, the clearance supervisor cannot remove the device lock keys until all locks are removed from the main lockbox.

1. The clearance supervisor places all device lock keys in the main lockbox.

**NOTE!**

The clearance supervisor is the first person to lock the main lockbox (as described below) and the last person to unlock it (as described in [Section D](#)).

2. The clearance supervisor performs the following steps:
 - A. Sign on to main clearance roster (per [Section C](#)).
 - B. Secure main lockbox with a personal lock and retain the key to that lock.
3. Authorized personnel locking on to the main lockbox perform the following steps:
 - A. Sign on to main clearance roster (per [Section C](#)).
 - B. Secure main lockbox with personal locks or contractor locks (as appropriate).
 - 1) Each authorized person who **IS** responsible for a satellite lockbox places the key to his or her personal lock/contractor lock into that satellite lockbox (as described in [Section B2](#)).
 - 2) Each authorized person who is **NOT** responsible for a satellite lockbox retains the key to his or her personal lock/contractor lock.

B2

Using a Satellite Lockbox

If some authorized personnel cannot use the main lockbox for any reason, then those authorized personnel use one or more satellite lockboxes (see [Attachment 2](#)) as needed (in addition to the main lockbox).

A satellite lockbox contains the key to an authorized person's lock on the main lockbox, and is secured by the personal locks and/or contractor locks of authorized personnel working under that authorized person (e.g., a contractor crew working under a contractor crew foreman). Therefore, the authorized person responsible for the satellite lockbox cannot remove their lock on the main lockbox (and the clearance supervisor cannot remove the device lock keys) until all locks are removed from the satellite lockbox.

1. One authorized person represents the group of authorized personnel locking on to a satellite lockbox (e.g., a contractor crew foreman). This person is responsible for maintaining the satellite lockbox and any associated documentation (including a roster for authorized personnel locked on to the satellite lockbox).
2. The authorized person responsible for the satellite lockbox performs the following steps:
 - A. Secure the main lockbox with a personal lock or contractor lock (as appropriate), and sign on to the main clearance roster, as described in [Section B1](#).
 - B. Take the key to the lock on the main lockbox and place it into a satellite lockbox.
 - C. Sign on to the satellite lockbox roster (per [Section C](#)).
 - D. Secure the satellite lockbox with a second lock (keyed differently than the lock on the main lockbox) and retain the key to that lock.
3. Each authorized person working under the authorized person in charge of the satellite box (e.g., the members of a contractor crew) performs the following steps:
 - A. Sign on to the satellite lockbox roster (per [Section C](#)).
 - B. Secure that satellite lockbox with a personal lock or contractor lock (as appropriate) and retain the key to that lock.

Section C. Actions During Clearance Work

This section provides instructions for actions that are (or may be) required during clearance work. The clearance supervisor or their delegate performs the steps in this section (except where specifically noted otherwise).

1. Start and maintain a roster of authorized personnel and their contact information. See [Form TD-4441P-20-F01, "Clearance Roster"](#) for a blank roster form.
 - A. If the main lockbox is the only lockbox, or if no lockboxes are in use, then the clearance supervisor's roster is the only clearance roster.
 - B. If any satellite lockboxes are in use, each authorized person responsible for a satellite lockbox starts and maintains a roster for the authorized personnel locked on to that satellite lockbox.

Section C (continued)

2. The clearance supervisor and other authorized personnel “Report On” or sign on to the clearance as shown in Table 2, “Reporting/Signing On.”

Table 2. Reporting/Signing On

ROLE	WHO TO CONTACT	HOW CONTACT IS DOCUMENTED
Clearance supervisor	Gas Control	Gas Control records date/time of “Report On” call.
Authorized person locking on to main lockbox	Clearance supervisor	Authorized person signs on to main clearance roster.
Authorized person when no lockbox is in use		
Authorized person locking on to a satellite lockbox	Authorized person responsible for satellite lockbox	Authorized person signs on to clearance roster for satellite lockbox.

3. Work group performs the job.
4. If any of the circumstances described in Table 3, “Special Circumstances,” arise, follow the corresponding instructions.

Table 3. Special Circumstances

CIRCUMSTANCE	CONDITION	INSTRUCTIONS
Clearance supervisor is unavailable and work is not complete.	N/A	Follow the process described in the appropriate gas clearance procedure to transfer clearance supervisor authority to another employee.
Work is complete but a lock cannot be removed (e.g., lock owner is unavailable, key to lock is lost, or lockbox is lost).	Lock owner confirms their work is complete (in person or by radio, text, email, phone, etc.).	<ol style="list-style-type: none"> 1. Obtain permission from clearance supervisor’s superintendent. 2. Record permission date/time on the Gas Clearance Document. 3. Remove the lock using bolt cutters or other tools.
	Lock owner cannot be reached.	<ol style="list-style-type: none"> 1. Confirm that the area is clear. 2. Confirm that the lock owner’s work is complete. <ul style="list-style-type: none"> • For a PG&E employee, confirm with employee’s supervisor. • For a non-employee, confirm with contractor representative (contract crew foreman, contract employee supervisor, or other crew lead). 3. Obtain permission from clearance supervisor’s superintendent. 4. Record permission date/time on the Gas Clearance Document. 5. Remove the lock using bolt cutters or other tools.

Section D. Actions After Finishing Clearance Work

This section provides instructions on actions taken after clearance work is complete.

The clearance supervisor or their delegate performs the steps in this section (except where specifically noted otherwise).

1. Ensure that:
 - All personnel are safe and clear.
 - Clearance-related work is complete.
 - Equipment is safe to return to normal.
2. Authorized personnel sign off of the clearance as shown in Table 4, "Authorized Personnel Signing Off."

Table 4. Authorized Personnel Signing Off

ROLE	SIGNS OFF WITH	HOW SIGN OFF IS DOCUMENTED	OTHER REQUIRED ACTION
Authorized person locked on to a satellite lockbox	Authorized person responsible for that satellite lockbox.	Sign off of clearance roster for that satellite lockbox.	Remove personal or contractor lock from satellite lockbox.
Authorized person responsible for satellite lockbox	Clearance supervisor, but only after all authorized personnel working under the protection of the satellite lockbox have signed off.	Sign off of main clearance roster.	Remove personal or contractor locks from satellite lockbox and main lockbox.
Other authorized person locked on to main lockbox	Clearance supervisor	Sign off of main clearance roster.	Remove personal or contractor lock from main lockbox.
Authorized person when no lockbox is in use	Clearance supervisor	Sign off of main clearance roster.	N/A

3. For transmission clearances only, if work requires testing the cleared equipment, refer to [Job Aid TD-4441P-10-JA01, "Testing Cleared Equipment to be Operational."](#)
4. If work does not require testing:
 - A. "Report Off" to Gas Control.
 - B. If any isolation points are secured with device locks, remove personal lock from the main lockbox and retrieve keys to device locks.
 - C. Place system back in operation per the clearance Sequence of Operations, including removal of device locks and tags. **RECOMMENDED:** Use diagonal cutters to cut tag ties.
5. Continue following appropriate gas clearance procedure to complete the clearance process.

Section E. Recordkeeping

This section provides recordkeeping instructions. The clearance supervisor or their delegate performs the steps in this section.

1. Scan and upload clearance roster(s) into the work clearance document (WCD) no more than 5 business days after completing the clearance.
2. Retain records per the Record Retention Schedule.

END OF PROCEDURE



Definitions

Additional Layer of Protection: Additional protection deployed for personnel safety, beyond operating tools/equipment to isolate hazardous energy (such as closing valves) and attaching tags.

Affected Personnel: Personnel doing work in an area where activities are being performed under lockout/tagout, but only as long as they do different work than the work described under “Authorized Personnel.” If affected personnel start performing the work described under “Authorized Personnel”, they become authorized personnel. See also the [Cal/OSHA definition of “Affected employee.”](#)

Authorized Personnel: Qualified personnel who execute gas clearances (i.e., personnel isolating energy by operating valves, squeezers, etc.) or who sign on with the clearance supervisor in order to perform work on the cleared equipment. See also the [Cal/OSHA definition of “Authorized employee or person.”](#)

Caution tag: A tag used to mark equipment (e.g., switches, valves, breakers) that, if operated, might endanger equipment or jeopardize systems operations.

Clearance: Permission from Gas Control to perform work on a system, which may include operational changes or isolating energy sources.

Clearance Point: Any point in the clearance that (if operated) can affect the system and gets tagged with a Man-on-Line or Caution tag.

Clearance Supervisor: The employee who is responsible for and manages the clearance.

Contractor Locks: Black locks for contractors to lock onto lockboxes.

Device Locks: Red locks (or other locking devices) used to secure equipment at isolation points.

Gas Clearance Document: The hard copy output of the WCD, which lists the Sequence of Operations and other instructions associated with the clearance.

Gas Control: The gas distribution control center (GDCC) or gas transmission control center (GTCC), as appropriate for the clearance work being performed.



Definitions (continued)

Information tag: A tag attached to controls, switches, or equipment to pass on additional information regarding their use in systems operations, but which is never used in place of an MOL or Caution tag.

Isolation Point: A clearance point that separates a source of energy from the work.

Main Lockbox: Locking box that holds keys to device locks in use on isolation points.

Lockout: Applying a PG&E-approved layer of protection to an isolation point (beyond the isolation itself and an MOL tag), whether or not that additional layer of protection specifically includes a physical locking device. See also “Additional Layer of Protection” and the [Cal/OSHA definition of “Lockout.”](#)

Man-on-Line (MOL) tag: A tag placed on isolation points (e.g., switches, breakers, gates, valves) to isolate equipment from all sources of energy and ensure that work can be performed safely between isolation points.

Personal Locks: Green locks provided to each employee who may work in areas that may require hazardous energy isolation.

Reporting Off: Official notification to Gas Control (or the operator on shift for manned stations) and, if applicable, notification in the clearance log, indicating that work is complete on cleared equipment.

Reporting On: Official notification to Gas Control (or the operator on shift for manned stations) and, if applicable, notification in the clearance log, indicating that cleared equipment is properly tagged, checked, and safe to work on and that the clearance supervisor is ready to begin work.

Satellite Lockbox: Locking box that holds the key to an authorized person’s lock on the main lockbox (preventing that person from unlocking the main lockbox before the satellite lockbox is unlocked).

Work Clearance Document (WCD): An electronic document in SAP associated with a specific Gas Clearance Document.



Implementation Responsibilities

GCC sent an email communicating upcoming clearance changes to all personnel who previously completed GAS-0401 ILT, “Gas Clearance Process Training,” GAS-0837 ILT, “TD-4441P-01: Writing/Endorsing/Approving,” or GAS-0838 ILT, “TD-4441P-01: Executing.” This email contained a tailboard that informed users of WCD changes coming in the September 21, 2015 SAP release in preparation for lockout/tagout (LOTO) and clearance alignment, and that further training would come during system wide roll-out of the new procedures.

Academy is creating interim training for the roll-out of LOTO and changes to the clearance process. Specific training is required for each role in the clearance and LOTO process. Personnel that already (prior to this publication) have roles in the process are required to complete the interim training course dedicated to only the changes in the process. This interim training will be conducted by the Academy from procedure publication through the procedure effective date (March 1, 2016) to ensure personnel understand the changes in their role prior to the effective date.



Implementation Responsibilities (continued)

Academy is also creating a new curriculum based on the revised procedures. In early 2016 the long term training curriculum will be complete. New personnel impacted by the LOTO and clearance processes will be required to complete the new training courses. Until this new training curriculum is complete, new personnel will be required to complete the existing training and the interim training.

Codes and Standards will update [TD-4441S](#) with the new training course numbers and titles in early 2016.

Clearance writers will have opportunities to attend WebEx learning sessions provided by the GCC to receive further communication on how the clearance writing process is changing to include LOTO.

A Gas TDM Comms email will be sent out after the last of the TD-4441 series publishes to communicate that they are now all available in the Technical Information Library (TIL). Additional messaging will occur company-wide to drive awareness of gas LOTO and clearance alignment.



Governing Document

- [Utility Standard TD-4441S, "Gas Clearances"](#)



Compliance Requirement / Regulatory Commitment

- [California Code of Regulations \(CCR\) Title 8, Subchapter 7, General Industry Safety Orders, Section \(§\) 3314, "The Control of Hazardous Energy for the Cleaning, Repairing, Servicing, Setting-Up, and Adjusting Operations of Prime Movers, Machinery and Equipment, Including Lockout/Tagout"](#)
- [CCR Title 8, Subchapter 7, General Industry Safety Orders, §3341, "Accident Prevention Tags"](#)
- [Code of Federal Regulations \(CFR\) Title 29, Labor, Part 1910—Occupational Safety and Health Standards, §1910.147, "The control of hazardous energy \(lockout/tagout\)"](#)
- [CFR Title 29, Labor, Part 1926—Safety and Health Regulations for Construction, §1926.417, "Lockout and tagging of circuits"](#)
- [CFR Title 49, Transportation, Part 192—Transportation of Natural and other Gas by Pipeline: Minimum Federal Safety Standards, §192.605, "Procedural manual for operations, maintenance, and emergencies"](#)



Supplemental References

- [Job Aid TD-4441P-10-JA01, "Testing Cleared Equipment to be Operational"](#)
- [Utility Standard SAFE-1009S, "Hazardous Energy Control \(Lockout/Tagout\) Safety Standard"](#)



Attachments

- [Attachment 1, “Man-on-Line, Caution, and Information Tags”](#)
- [Attachment 2, “Locks, Lockboxes, and Locking Devices”](#)
- [Attachment 3, “Example Scenarios”](#)
- [Form TD-4441P-20-F01, “Clearance Roster”](#)
- [Job Aid TD-4441P-20-JA01, “Isolation Devices and Locking Requirements”](#)



Document Feedback

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Revision Notes

Revision 0a:
Form TD-4441P-20-F01: Added LAN ID to name fields.

Revision 0:
This is a new utility procedure that describes the process of ensuring employee safety by lockout/tagout of hazardous energy sources while performing gas clearance work.