



**Pacific Gas and Electric Company**

# Gas Information Bulletin

**Title:** Preventing Mechanical Damage to Gas Transmission Lines

Check all appropriate boxes

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|-----------------------------------------------------------------|-----------------------------------------|--------------------------------------------------|-------------------------------------------|
| <input type="checkbox"/> SAFETY ALERT                           | <input checked="" type="checkbox"/> GAS | <input checked="" type="checkbox"/> DISTRIBUTION | <input type="checkbox"/> ESTIMATING       |
| <input checked="" type="checkbox"/> MANDATORY COMPLIANCE        | <input type="checkbox"/> ELECTRIC       | <input checked="" type="checkbox"/> TRANSMISSION | <input type="checkbox"/> MAPPING          |
| <input type="checkbox"/> RECOMMENDED ACTIONS                    |                                         | <input type="checkbox"/> OPERATIONS              | <input type="checkbox"/> SUBSTATION ENGR. |
| <input checked="" type="checkbox"/> INFORMATIONAL/CLARIFICATION |                                         | <input type="checkbox"/> SERVICE                 | <input type="checkbox"/> TRANS./SUB. M&C  |

**Note:** This Gas Information Bulletin 151, Rev 2, replaces the GIB 151 dated 5/04/05. This information will be incorporated into all applicable documents in the 2007 Standards Update Initiative.

## Gas Transmission Policy Preventing Mechanical Damage to Gas Transmission Pipelines

This policy is intended to reaffirm and clarify required procedures and practices designed to prevent buried gas transmission pipelines from being mechanically damaged by external forces. This policy applies to **ALL** buried gas transmission pipelines and gas pipeline facilities with normal operating pressure greater than 60psig. The requirements also apply to **ALL** parties involved with Mark and Locate, Excavation, and Standby operations. California's Government Code defines high priority subsurface installations as high pressure natural gas pipelines with normal operating pressures greater than 415 kPA gauge (60 p.s.i.g).

This policy provides requirements in addition to existing PG&E standards, and replaces the Gas Information Bulletin 151, dated 05/04/05. Existing related PG&E standards and guidelines include Utility Standard S4412, *Protection of Underground Infrastructure*, Utility Standard G14412, *Site Delineation and Mark and Locate Surface Markings*, and Utility Standard G14413, *Procedures for Excavating Pipelines and Services*. For gas distribution facilities, follow the requirements of Gas Information Bulletin 155, *Preventing Mechanical Damage to Gas Distribution Facilities*.

This policy was developed by a cross functional team of GT&D Engineering, General Construction and Distribution M&C employees. Past incident report root cause findings, policies, as well as knowledge of actual field practices being employed, were all used in the development of this policy.

**No Excavation is allowed under the following conditions:**

- If no current Utility Service Alert (USA) Ticket exists
- If no Mark and Locate has been performed
- No Standby available = No dig!! (with-in 5 feet)

### LOCATING TRANSMISSION PIPELINES

The following describes the Mark and Locate requirements for locating all gas transmission pipelines. Employees performing Mark and Locate tasks are required to be Operator Qualified for OQ task 05-01.

**Method - All GAS TRANSMISSION pipelines shall be conductively located using a direct connection.** In the event this is not possible, due to the lack of available facilities to connect to (e.g., ETSS, valves, regulator sets, etc.), authorization to inductively locate must be obtained by the district or area supervisor. Before obtaining this authorization, the locator must complete the checklist on the USA ticket, document that all possible efforts to connect to the pipe have been expended and a Corrosion Mechanic should be consulted for help with direct contact locating. **If the pipe must be**

**inductively located, the locator shall carefully probe and/or hand dig to VERIFY that the pipeline has been properly located.**

If probing or hand digging is not possible at the time of mark and locate operations because of hard surface (e.g., concrete, asphalt, etc.), and the pipe is inductively located to within 10 feet of a planned excavation, then the exact pipeline location shall be confirmed during excavation with an assigned Standby person present. If the exact pipeline location is confirmed during excavation, and the outside edge is more than 5 feet from the excavation, no further Standby will be required. As allowed by Utility Guideline G14413, power-operated equipment may be used to remove pavement if there are no facilities within the pavement. If inductive locating is authorized as described above, and if the pipe is exposed by excavation, an ETS shall be installed whenever practical and a direct connection shall be established to mark and locate the remaining pipe in the USA boundary. If this operation cannot be accomplished, a Work Request shall be submitted (and the number noted on the USA ticket) at the close of the job to ensure an ETS is installed in a suitable and accessible location to facilitate future conductive locating procedures.

**Installation of ETS to Allow Conductive Locates** - In implementing this policy, each district or division crew should identify ETS installations that are needed to ensure conductive locates can be performed in the future.

**Locating Pipeline Offsets or Branches** - In the event a pipeline offset (change in pipeline direction) or branch has been marked with any instrument, conductively or inductively, the location of the marked pipeline offset or branch SHALL be verified using probing and/or hand digging, BEFORE allowing any power operated excavation within 5' of the pipeline.

**Multiple PG&E Facility Locates** - In the event two different PG&E gas pipelines (transmission and distribution) are present within the USA boundary, district and/or division employees performing MARK AND LOCATE shall communicate to the excavator the fact that two PG&E pipelines are identified on the USA ticket, and that both must be properly marked and located BEFORE any excavation within the USA ticket boundary is performed.

**Discovery of Inaccurate Mark and Locates** - In the event it is determined during excavation that a buried pipeline has been mis-marked, the responsible engineer shall be immediately be contacted and the incident investigated to determine the root cause. The Mark and Locate shall be re-established and excavation postponed until the new Mark and Locate is completed.

All other requirements in PG&E Utility Standard S4412 and Utility Guideline G14412 also apply to MARK AND LOCATE activities.

## **EXCAVATION PROCEDURES**

The following procedures provide additional clarity on required practices when excavating in the vicinity of pipelines. All other provisions detailed in Utility Guideline G14413 also apply.

### **Requirements for Confirmation of Pipeline Location**

Excavation procedures described herein, and described in Utility Guideline G14413, apply to ANY excavator, including PG&E or Third Parties. The following conditions require confirmation or exposing of the pipeline location:

- **Confirm pipeline location if excavation is from 2-5 feet of the nearest side:** Before and during excavation, confirm the location of all marked pipelines by using a probe bar and/or hand-digging to expose the line. Confirmation is required whenever the nearest side of the gas pipeline is from 2-5 feet of a planned excavation. At no time is power-operated equipment to be used within 12 inches from the outside wall of the gas pipeline. Vacuum Excavation Equipment may be used following requirements in Utility Guideline G14413. (For vacuum excavation used

on steel gas pipe with coatings other than polyken wrapped coatings: High pressure air excavation tools can be used with pressures up to 120 psi and high pressure water excavation tools can be used with pressures up to 1500 psi with a minimum nozzle angle of 40 degrees. Polyken coating has a 1000 psig water pressure limitation.)

- **Expose the pipeline if excavation is within 2 feet of the nearest side:** If excavation activities are going to occur within 2 feet of the nearest side of the gas pipeline, the nearest side of the pipeline must be exposed for the entire length of the bell hole to ensure the excavator does not hit the pipeline. The excavator must hand dig if the excavation is within 12 inches from the outside edge of the pipeline.
- **Confirm location of any construction involving the installation of above ground structures:** Permanent structures shall not be on the right of way unless written approval has been given by the responsible Pipeline Engineer. Such structures limit our ability to maintain and operate the pipeline.
- **If excavation procedures include blasting:** Follow GPTC's *Guide for Gas Transmission and Distribution Systems* – Appendix G-192-16. This Guide addresses leak surveys that must be conducted, as well as other requirements. Please consult the appropriate Pipeline Engineer for more information.

#### **Specific Procedure for excavation within 5 feet of the Pipeline**

**PROBING:** (NOTE: If the ground conditions do not permit probing, go to HAND EXCAVATION) Probe to a depth of approximately 24 inches and at a spacing intervals no greater than 5 inches. Probing is to be done at right angles to the pipeline for the full width of the proposed day-lighting excavation.

- If the pipeline is within 24 inches of the surface, power excavation is not permitted closer than 12 inches from the pipeline. The remaining 12 inches of cover must be removed by hand, using a shovel.
- If it is determined that the depth of the pipeline is greater than the depth of the initial probing, then excavation by power-operated equipment is permitted to a depth 12 inches less than the actual initial probing depth.
- After the initial excavation by power-operated equipment has been completed, continue probing (if soil conditions permit accurate probing) and power-excavating until the excavation is within 12 inches of the pipe. The remaining 12 inches of cover must be removed by hand, with a shovel. If probing can not be done, go to **HAND EXCAVATION**.
- Care should be taken to identify and communicate the presence of, and location of, Mueller and TDW fittings that may significantly protrude above, or to the sides of, the pipeline. This is particularly true where extensive paralleling work is being performed.

#### **HAND EXCAVATION (NO PROBING):**

Hand dig, using a shovel, a trench approximately 18 inches in depth across the full width of the proposed day-lighting excavation.

- If the pipeline is within 18 inches of the surface, power excavation is permitted to no closer than 12 inches of the pipeline. The remaining 12 inches of cover must be removed by hand, using a shovel.

- If it is determined that the depth of the pipeline is greater than the depth of the initial hand dug trench, then excavation by power-operated equipment is permitted to a depth 12 inches less than the actual initial trench depth.
- After the initial excavation by power-operated equipment has been made, remove an additional 6 inches of cover (in the hand dug trench) by hand digging. If the pipeline is not exposed in the now 18 inch deep hand dug trench, an additional 6 inches of soil can be removed by power operated equipment from the initial depth of the machine dug excavation.
- The procedure of alternately hand-digging and power-excavating at 6 inch intervals must be continued until the power-excavating is within 12 inches of the pipe. The remaining 12 inches of cover must then be removed by hand, using a shovel. Extreme care must be taken during this procedure to ensure that the hand-dug trench or probing operation is wide enough to allow for the cut made by the corner teeth on a backhoe bucket, or other equipment, in the event that the excavation machinery is not positioned directly over the main. In all cases, the remaining 12 inches of cover must be removed by hand, using a shovel.
- Once the pipe is exposed, all sides of the pipe are to be located and exposed. Once the sides are exposed by hand, excavation with power-operated equipment is allowed, taking care to maintain a minimum of 12 inches between the power-operated equipment and the pipe. These procedures are to be followed until the pipe is fully located and exposed.
- For excavations of extended lengths occurring parallel and within 5' of a pipeline, the pipeline location must be "confirmed" by exposing the pipeline at enough locations to instill confidence in the markings. The absolute **maximum** distance between confirmations is 100 feet while still maintaining a minimum distance of 24" on either side of the pipe.

## STANDBY REQUIREMENTS

The following describes the stand by requirements when excavations around a gas pipeline are conducted by PG&E or an outside excavator. Employees performing Standby tasks are required to be Operator Qualified for OQ task 05-02, Standby. The Standby person does not need to be OQ'd in Mark and Locate.

### When Required:

**Site Visits come within 10 feet of the high priority pipeline** - California Government Code 4216 specifies site visits for high priority subsurface installations.

When the excavation is proposed within 10 feet of a high priority subsurface installation, the operator of the high priority subsurface installation shall notify the excavator of the existence of the high priority subsurface installation prior to the legal excavation start date and time. The excavator and owner/operator shall conduct an onsite meeting at a mutually-agreed-on time to determine actions or activities required to verify the location of the high priority subsurface installations before excavation start time.

**Excavation Activities within 5'** - A Standby person is required to be on site whenever excavation (digging, trenching, etc.) is within 5 foot from the edge of the pipeline. Field visits during excavations that are not planned to be within 5 feet of the edge of the pipeline are encouraged, especially during multiple day jobs. A Standby person should be considered during excavations outside the 5 feet buffer if the excavator does not understand the requirements or has a history of not complying with safe USA practices.

**Agricultural Activities** - During normal agricultural operations (such as tilling, discing, or ripping), it is strongly encouraged to have a Standby person on site during the first day of the operations or until the agricultural operator has demonstrated to the Standby person that the operator has the ability and desire to comply with safe excavation practices. **A Standby person is required to be on site if any of the following conditions exist:**

- The pipe is confirmed to be shallow enough to possibly be hit by the type of agricultural operation being performed and the agricultural operation doesn't have a process in place to protect the pipeline.
- The agricultural operator is known to not understand or comply with safe USA and agricultural practices.
- Positive contact (by either face or phone) has not been achieved for this specific USA ticket.

Standby activities for agricultural operations exceeding 1 day are not required, unless any one of the above described conditions are present. When agricultural operations are planned to occur over many days, field visits are encouraged to ensure that the operator is still complying with all required safety practices.

**Boring Activities** - A Standby person is required when any kind of boring activity is performed crossing the pipe. A Standby person is also required for any boring activity parallel to the pipeline that will come within 10 feet of the nearest side of the pipe. Please consult the appropriate Pipeline Engineer to clarify the standby requirements for boring activities. [For boring operations that crosses our pipelines perpendicularly, the PLE may consider exposing at a minimum of 18-inches below the bottom of the pipeline nearest to the bore entry point and remain open until the reaming operation is completed. By requiring this, we can confirm our 12-inch clearance requirement and prevent accidental dig-ins by an errant pilot hole or reaming pullback.]

**Blasting Activities** - A Standby person is required for any blasting activity within 50 feet of the nearest side of the pipeline. Please consult the appropriate Pipeline Engineer to review the nature of the project.

#### **Responsibilities of a Standby Person**

- Obtain the current USA Ticket. (confirm active)
- Obtain and review all appropriate drawings (plat sheets, GIS maps, etc.)
- Ensure that you have an operating radio or cell phone.
- Obtain locating equipment (probe rod and shovel).
- Document all field meeting conversations with the excavator on the USA Ticket
- Ensure that the potential hazards of this pipeline are communicated to the operator
- Observe when a third party is probing or hand digging and provide direction to the Back-hoe operator.

#### **Specific On-Site responsibilities include the following:**

- Conduct a tailboard with the Excavator and the excavation crew. Review the location of the line, potential safety hazards and required safe excavation procedures, as required in this bulletin and in PG&E Utility standards
- If the pipeline is within 5' of a planned excavation, confirm the existing Surface Marks within the USA boundary. The location can be confirmed by the Standby person using a probe bar and/or hand digging to expose the line. Or the location can be confirmed by requesting that the excavator, with the Standby person present and observing, confirms the location using a probe bar or hand digging. See Utility Guideline G14413.

- Inspect the work in progress, and **STOP the work anytime the excavator does not follow the excavation rules discussed with him.** If the excavator continues to break the rules, the job shall be shut down and the appropriate supervisor should be notified. If the operator will not comply, move to a safe location and dial 911 and report the situation to the local authority, and then contact the appropriate supervisor. Also, follow SH&C Procedure 104, *Third Parties Working Unsafely Around Utility Facilities.*
- For every day the excavation job is in progress, the Standby person should verify the excavator's compliance by looking for other excavation locations that may not have been marked and located by USA, or where the excavator was within 5' of a pipeline and a Standby task was not performed.

**If excavations have occurred without a USA ticket:**

Require the excavator to apply for a USA ticket. After the USA ticket is received, mark and locate any pipelines in the vicinity. If a pipeline is determined to be within 2 feet of the excavation, the pipeline shall be exposed after the two working day USA notification period in order to check for mechanical damage.

**If excavations have occurred when a Standby person was not present:**

Excavated locations within 5' of pipelines with a valid USA, which had been marked and located but no Standby was present, shall be probed or hand dug to confirm the location of the pipeline and verify that the excavation did not come within 12 inches of the pipe's outside edge. If the excavation came closer than 12 inches from the pipe's outside edge, the pipeline shall be exposed to verify the condition of the wrap.

In all cases where the excavator does not comply, the Standby person should discuss the issues with the excavator and consider completing SH&C Form 103, "Observed Hazards Notification". If the excavator continues to break the rules, the Standby person should enlist his/her supervisor to bill the excavator for the extra time required to verify the integrity of the pipeline and consider other legal recourse.

**INCIDENT INVESTIGATION FOR MIS-MARKED FACILITIES**

All third party incidents shall be reviewed to determine if a mis-mark contributed to the incident. If the pipeline had been USA'd and Mark and Located by PG&E personnel, and the mis-mark could have contributed to the incident, the Mark and Locate must be recreated. The original Mark and Locate must be recreated within 3 days of the incident, as part of the root cause analysis.

**Approved by:**

*(original signed by)*

[Redacted Signature]

**Date:** 5/1/07

**Author:**

[Redacted Author Name]

**If you have any questions about this bulletin, please call the employee(s) listed below:**

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