



UO Standard S4412

ISSUING DEPARTMENT:	GD&TS	EFFECTIVE DATE:	01-05
UO SPONSORS:	Senior Director – E&P VP - CGT	REVIEW DATE:	01-10
		PAGE NO:	1 OF 4

TITLE: Protection of Underground Infrastructure

Purpose

This standard establishes uniform procedures for the following actions:

- Responding to external requests to locate and mark Pacific Gas and Electric Company (Company) underground (UG) infrastructure using Underground Service Alert (USA).
- Preventing damage to Company UG infrastructure.
- Requesting information and avoiding damage to subsurface installations when the Company is the excavator.
- Identifying and handling noncompliant excavators.
- Responding to requests from public agencies and other third-party entities for Company UG infrastructure information.

This standard supports the following UO Policies: 3-7, "Gas and Electric Maintenance and Operation," 3-8, "Installation of Gas and Electric Facilities," and 3-10, "Reconstruction of Gas and Electric Facilities."

Revision

This standard supersedes S4412 "Protection of Underground Infrastructures," effective October 2000.

Safety

Failure to locate and mark Company UG infrastructure in a timely and accurate manner poses a risk to Company employees, excavators, and the public. Without accurate surface markings, excavators may damage Company UG infrastructure during excavation projects. Employees performing locating and marking shall comply with all personal protective equipment and work area protection requirements as outlined in the applicable Company standards, guidelines, Code of Safe Practices, and Work Area Protection Guide.

Implementation Responsibilities

The senior director of Engineering and Planning (E&P) and the vice president of California Gas Transmission (CGT) are responsible for reviewing, approving, and distributing this standard.

The Operations, Maintenance and Construction (OM&C) area, Transmission Substation Maintenance and Construction (T/S M&C) and Gas System Maintenance and Technical Services (GSM&TS) department directors, managers, superintendents, and supervisors are responsible for ensuring that employees are trained and comply with the requirements of this standard. In addition, they are responsible for providing sufficient resources to achieve the requirements of this standard.

Employees are responsible for carrying out their assigned tasks. For their own safety and that of the general public, employees are responsible for performing only the tasks for which they are trained, knowledgeable, and qualified. When necessary, they shall notify their supervisor of any additional training, equipment, or resources needed to perform their assigned tasks.

Nothing in this document is intended to modify current work jurisdiction as described in labor agreements and established via local practices.

- Compliance** The responsible OM&C, T/S M&C and GSM&TS directors and superintendents implement and measure the effectiveness of this standard. In addition, internal Company departments may conduct periodic audits. The California Public Utilities Commission (CPUC) also conducts compliance reviews of the requirements in this standard.
- Policy** The Company will respond to USA requests to locate and mark Company owned UG infrastructure according to the procedures in this standard and in accordance with the Company's Protection of Underground Infrastructure (PUJ) manual and other referenced codes and standards. All Company excavations will also be done in accordance with this standard as well as the PUJ manual. Maps and records of Company UG infrastructure will be provided to public agencies and other external entities in accordance with the provisions of this standard.
- Procedures** The directors of GD&TS, T/S M&C, Electric T&D Engineering (ET&DE) and GSM&TS are authorized to modify these detailed procedures, forms, or instructions, as needed, or to approve variances from this procedure on an exception basis.
- This standard is comprised of the following attachment:
1. Procedures for Protection of Underground Infrastructure

Date Issued/Updated

Effective: January 2005

Review Date: January 2010

Signed,

Signed,

Kevin J. Dasso
Senior Director
Engineering and Planning

Robert T. Howard
Vice President
California Gas Transmission

Reference Documents

California Government Code, Section 4216
California Business and Professions Code, Section 7110
Construction Safety Orders; Code of Federal Regulations (CFR), Title 8,
Section 1540, "Excavations"
USP 21, "Damage Claims Collection"
USP 22, "Safety and Health Program"
UO Standard D-S0350/S4110, "Leak Survey and Repair of Gas
Transmission and Distribution Facilities"
UO Standard D-S0457 "Gas Mapping Standard, 1" = 100' Plat Sheets"
UO Standard S0502, "Protection of Sensitive Operational Information"
UO Guideline 14412 "Site Delineation and Mark and Locate Surface
Marking"
UO Guideline 14413, "Procedure for Excavating Pipelines and Services"
Gas Distribution Information Bulletin 151, "CGT Policy Preventing
Mechanical Damage to Transmission Lines"
Gas Distribution Information Bulletin 155, "Preventing Mechanical
Damage to Gas Distribution Facilities"
SH&C Procedure 103, "Public Safety Information Program"

UO Standard

January 6, 2005

SH&C Procedure 104, "Observed Hazard Notification: Third Parties Working Unsafely Around Utility Facilities"

Gas Standards and Specifications, Gas Design Standards, A-90, M-60 – M-62, O-10, and O-10.1

Code of Safe Practices

Horizontal Directional Drilling Manual

Work Area Protection Guide

Protection of Underground Infrastructure

Attachment

Attachment 1, "Procedures for Protection of UG Infrastructure"

Information

Additional copies of this standard are available on the Company Intranet at: http://www.techlib/default.asp?body=manuals/uo_standards/all_uo_standards.asp.

Specific questions or suggestions regarding this standard may be submitted to Gas Distribution and Technical Services at the following Company Intranet website: <http://uo/td/gdts/>

Distribution

UO officers and directors
 GSM&TS maintenance superintendents
 T/S M&C overhead line superintendents
 GSM&TS managers
 UO T&D superintendents and managers
 Technical and Ecological Services director
 HR Learning Services director

**Attachment 1
Procedures for Protection of UG Infrastructure**

1. Definition of Terms

Acoustic Locating: A method of locating underground facilities in which an audible signal is applied to a pipeline through the use of an acoustic transmitter.

Approximate Location of Subsurface Installations: A strip of land not more than 24 inches on either side of the exterior surface of the UG infrastructure. "Approximate location" does not include depth measurements.

CGT: California Gas Transmission. The Company's gas transmission department.

Company: Pacific Gas and Electric Company, its contractors, and authorized representatives.

Conductive Locating: A method of locating underground facilities in which an active signal is directly applied to the pipe or cable by way of a transmitter connected directly to that facility.

Conflict: When Company UG infrastructure is located within the scope of an area delineated for excavation.

Critical Facilities: Those facilities which, if damaged, are likely to result in difficulty controlling the gas flow due to the size, material properties, operating pressure, and/or location of the facility. When determining the difficulty of controlling gas flow, consideration must be given to employee and equipment availability. Also, critical facilities are those electric distribution facilities which, if damaged, are likely to result in extensive (long duration) outages or outages to customers who are considered critical. The local operating area determines gas and electric distribution critical facilities. All gas transmission pressure (above 60 psig) facilities and all electric facilities operating at and above 60 kV are considered "critical facilities" for the purposes of this standard.

Delineation: The identification of Company or an external entity's work area by pre-marking the area of proposed excavation with surface markings or by other means.¹

Emergency: A sudden, unexpected occurrence involving a clear and immediate danger, demanding immediate action to prevent or mitigate the loss of, or damage to, life, health, property, or essential public services. Unexpected occurrences include, but are not limited to, fires, floods, earthquakes, or other soil or geologic movements, riots, accidents, damage to a subsurface installation requiring immediate repair, or sabotage.

EMS: Electronic Marker System. Devices that are encased in polyethylene housings that use passive antennas until they are activated by a locating instrument operating at a frequency compatible with that of the markers' antennas. These devices are installed on or adjacent to UG infrastructure to facilitate locating.

Estimate: Detailed estimate of the costs of all or part of a project. Approval of a job estimate constitutes appropriation of funds to undertake work as described in the job estimate.

ETS: Electrolysis Test Station. A structure to house the test wires that are bonded to buried metallic piping or structures. These wires are run up to the ETS, in a location normally at ground level or above ground to test the adequacy of the cathodic protection system.

¹Delineation is not used in this standard to mean providing facility records to external agencies

- Excavation:** Any operation in which earth, rock, or other material in the ground is moved, removed, or otherwise displaced by means of tools, equipment, or explosives in any of the following ways: grading, trenching, digging, blasting, ditching, drilling, auguring, tunneling, scraping, cable or pipe plowing and driving, or any other way.
- Excavator:** Except as provided in Section 4216.8 of the California Government Code, any person, firm, contractor, or subcontractor, owner, operator, utility, association, corporation, partnership, business trust, public agency, or other entity which with their, or his or her, own employees or equipment performs any excavation.
- External Entity:** Any non-Company individual or organization requesting UG infrastructure information for locating or engineering purposes.
- Field Meets:** Prearranged meetings between the locator and excavator. Field meets are intended to inform the excavator of the location of and danger posed by Company facilities. They may also be used to clarify any questions the excavator has for the Company regarding its facilities or timetable for the excavation.
- GPR:** Ground Penetrating Radar. A specialty-locating instrument that uses active radar antennae to transmit signals to subsurface objects and receive reflected signals back to the device to ascertain if fixed objects lie beneath the surface of the earth.
- Hand Digging:** Excavating with any tool that derives its motive force from any nonmechanically powered means.
- Inductive Locating:** A method of locating underground facilities in which a signal is indirectly applied to a pipe or cable by creating a magnetic field.
- ISTS:** Information System and Technology Services. The department within the Company that is responsible for the operation and maintenance of computing, fiberoptic, and telecommunication services.
- Locator:** An employee of the Company assigned the duties of marking and locating Company UG infrastructure.
- MapGuide:** Company Intranet Geographic Information System (GIS) where the location and data for critical gas transmission facilities are kept.
- Memorandum of Understanding (MOU):** A signed agreement that specifies roles and responsibilities of one Company department performing work for another.
- Mobile Computing:** A one-call ticket reception system where USA tickets are dispatched from a regional one-call notification center directly to a locator's vehicle through the USA ticket software.
- No Conflict:** Where no UG infrastructure is located within the scope of the delineation, or within the work area as described on the USA ticket.
- Noncompliant Excavator:** An excavator whom Safety, Health and Claims (SH&C) has determined to be a repeat violator of safe excavation practices in accordance with the requirements of Chapter 9 of the Protection of Underground Infrastructure manual.
- Operator:** Any person, corporation, partnership, business trust, public agency, or other entity, which owns, operates, or maintains a subsurface installation. Refer to Section 4216.1 of the California

Government Code for exceptions.

Operator Qualification (OQ) Program: A mandated training and qualification program for gas pipeline employees pursuant to the rules of the U.S. Department of Transportation (DOT) set forth in the Code of Federal Regulations (CFR) 49 CFR 192.805, "Qualification Program."

Passive Locating: A method of locating underground facilities in which naturally present signals are detected through the use of a passive receiver.

Positive Response: Communication with the excavator, before excavation, to ensure that the Company has located its UG infrastructure and marked any potential conflicts within the areas of the planned excavation, or that there are no conflicts with the proposed excavation. The submittal of Company records to an excavator in lieu of surface marking also constitutes positive response.

Probing: A method of physically locating buried gas facilities before using power-operated equipment.

Qualified Company Representative (QCR): A Company representative, who, because of knowledge, required training, and work experience, is able to identify hazards and accurately complete an assessment of facilities. This individual shall have a current OQ for all tasks related to standby for gas facilities. An OQ is not required for persons performing electric locating, marking or standby.

SAR: Service Area Registration. An Internet computer application used by utility operating departments to inform USAN of where the Company would like to receive notifications of excavating activity for a particular geographic area.

Site Visits: Unannounced, periodic visits to an excavation location to monitor the excavator's compliance with laws and regulations.

Standby: A process by which a QCR is present at an excavation site at all times while excavation is occurring. A standby employee must make all reasonable efforts to stop unsafe actions near Company facilities.

Subsurface Installation: Any underground pipeline, conduit, duct, wire, or other structure except nonpressurized sewer lines, nonpressurized storm drains, or other nonpressurized drain lines.

Surface Indications: A technique to detect the presence and location of UG infrastructure from pavement cuts and other physical features (bell-holes, trench lines, valve frames and covers, box lids, etc.), or service locations.

Telecommunication Facilities: Fiber optic, bundled copper wire, and other lines used to transmit the voice, data, and Supervisory Control and Data Acquisition (SCADA) signals.

Underground (UG) Infrastructure: Company UG gas and electric distribution and transmission facilities, pipelines, mains, services, ducts, conduits, conductors, wires, manholes, splice boxes, and telecommunication lines and associated substructures.

Underground Service Alert (USA): Regional one-call notification centers for the Company service territory. There are two centers serving the Company: Underground Service Alert of Northern California (USAN) and Underground Service Alert of Southern California (USAS).

USA Ticket: A document created when an excavator calls USA requesting underground facility locations before excavating.

USA Ticket Software: Company-approved software used to process and manage the USA function.

2. Procedures for Responding to USA Tickets and Providing Company Underground Infrastructure Information

A. Responding to USA Tickets

- (1) Response to USA tickets must include the location of all Company UG infrastructure in the area delineated by the excavator. A local Memorandum of Understanding (MOU) detailing responsibilities between Company departments must be established when more than one department is responding to requests in the same geographical area. In these situations, multiple department coordination may be necessary.
- (2) Engineering (design) locates processed through the USA system should be discouraged. If an engineering locate request is submitted, follow the procedures in the PUI manual, Section 15, "Policy for Suspected 'Design-Locate' Requests."
- (3) All responses and provisions of UG infrastructure information shall be as complete and reliable as possible. Pertinent Company records shall be consulted for status on all UG infrastructures. To ensure that information on Company records is current, all estimates shall be temporarily posted after the estimates are approved. At a minimum, a boundary line should be drawn on the Company records provided to locators to identify the area of construction. The local job number should be shown as well as the proposed location of the construction. Operational changes to gas and underground electric distribution facilities should be temporarily posted to distribution plats on a daily basis. Operational changes are defined as any change to UG infrastructure that affects the flow of gas or electricity into or within a system. Individual services need not be temporarily posted. This posting indicates that Company UG infrastructure is, or may be, installed.
- (4) The excavator is required to delineate the boundaries of the excavation with white paint or other suitable markings unless information provided by USA indicates otherwise.
- (5) When a timely notification of proposed excavation work is received from USA and the excavator has previously delineated the construction area, the Company shall, where feasible, within 2 working days of the ticket date or at a later time as agreed to by the Company and the excavator, locate and mark the location of its UG infrastructure. This requirement extends to all Company excavations. Marks identifying the approximate location of UG infrastructure shall be placed on the surface and 2 feet beyond the area indicated on the ticket or by the delineation placed by the excavator.
- (6) The OM&C, T/S M&C and GSM&TS departments are responsible for the locating and marking of all Company UG infrastructures. When the OM&C, T/S M&C or GSM&TS departments require assistance from another operating department, it shall be made readily available. Locating and marking shall be performed by a person qualified by the OQ program using approved locating equipment and pertinent Company records.
- (7) Records used for mark and locate purposes shall be provided to locators in the following order of preference:
 Computerized facility records accessed directly by the locator from an online application or disk.

Reduced-size gas plat sheets or aperture card products*.

Reduced-size electric plat sheets or aperture card products*. Contact GD&TS for assistance in determining the suitability of reduced-size electric plat sheets.

Full-sized gas plat sheet copies. Distribute these only for large, ongoing projects where multiple USA tickets may be issued.

Full-sized electric plat sheet copies.

Copies of abandoned facility records, if they are available.

"As-built" drawings for unmapped facilities, where required.

If required, gas service records for unmapped facilities where the service locations are not readily identifiable by surface indications.

Where required, electric duct maps for congested areas.

Microfiche.

*Use durable, high-quality, pre-punched paper when preparing reduced-size plat sheet books for locators. Eighty-pound paper is recommended for this application.

Note: Maps scaled larger than 1" = 100' (e.g., 1" = 500') shall not be reproduced for locator books. In areas where the distribution map is larger than 1" = 100', provide a full-size map copy to the locator.

(8) Facility records provided to the locator shall be kept current.

(9) Field markings shall conform with the following color codes (Table 1):

Table 1 - American Public Works Association (APWA) Color Codes for Surface Marking

Color	Description
Red	Electric power, distribution and transmission installations, or municipal electric installations
Yellow	Gas distribution and transmission installations, or distribution and transmission installations or installations containing or transporting dangerous materials, products, or steam
Orange	Telephone and telegraph installations, police and fire communication installations, and cable television installations. This includes Company communications facilities
Blue	Potable water installations. This includes Company water facilities
Green	Sewer installations
Purple	Reclaimed water and slurry pipelines
White	USA delineation area (provided by excavator)
Pink	Temporary survey markings (provided by developer)

(10) The Company will notify the excavator when there is no UG infrastructure in conflict with the proposed excavation in the following order of preference:

- Verbally by telephone.
- Email/fax (if provided, an email information or fax number).
- Verbally in person.
- Surface marking.

(11) Maps and sketches supplied to the excavator shall be limited to the immediate area of the request and shall be stamped with the following:

**APPROXIMATE LOCATIONS
 VERIFY BY HAND TOOLS
 PACIFIC GAS & ELECTRIC COMPANY
 DATE: / /**

"WARNING: Confidential, Proprietary Information

This document contains confidential, proprietary information that is the sole property of Pacific Gas and Electric Company and is intended for use only by authorized Pacific Gas and Electric Company employees and agents.

Copyright Pacific Gas and Electric Company 20__"

(12) All responses to USA tickets shall be recorded in the USA ticket software.

- (13) Providing the depth of the Company UG infrastructure is not required (Section 4216 of the California Government Code). Locating technology is not considered as a reliable means of providing accurate facility depth information. As such, it is Company policy not to provide depth. Exceptions to this may be made only to facilitate franchise relocations or other Company generated projects.
- (14) On receipt of a USA ticket extension or renewal, the Company shall, where required and if requested by the excavator, re-locate and re-mark UG infrastructure that may be affected by the excavation. This shall be done within 2 working days of the request, before the start of excavation work, or later as agreed to by the Company and the excavator.
- (15) For facilities that cannot be readily located by using instruments, install approved permanent markers or an ETS whenever the facility is exposed or otherwise accurately located. Use markers that most suit the location, either EMS or curb markers. Follow the provisions of Gas Design Standard M-62, "Approved Specialty Locating Instruments," to install EMS markers. Follow the provisions of Gas Design Standards O-10, "Electrolysis Test Station Connection to Main," and O10.1, "Electrolysis Test Stations," to install ETS. Supplemental information may be found in Gas Design Standard A-90, "Plastic Main and Service Installation." Send the EMS or ETS installation information to the appropriate mapping group. EMS devices, when placed over a buried facility, are to be considered accurate for future locating purposes. Curb markers are placed on the surface over or near buried facilities and therefore are not to be used in lieu of normal surface markings as required by UO Guideline G14412, "Site Delineation and Mark and Locate Surface Marking."
 EMS markers or curb markers may be used to identify buried facilities that present the following problems:
 - Facilities have limited access points.
 - Facilities are located in roadways that are subject to heavy traffic.
 - Facilities are otherwise not conducive to locating.
 When the accuracy of a locate is questionable or unknown, conduct a field meet with the excavator to convey marking information. Maps, measurements and surface indications may be used if conditions do not permit the timely use of specialty locating equipment.
 New technology applications shall only be used with approval from GD&TS, ET&DE or GSM&TS as applicable.

B. USA Ticket Processing Responsibilities

Employees assigned to process the USA tickets received in their offices are accountable for performing the following.

- (1) Verify that all transmitted tickets for the previous day were received in accordance with the PUI manual.
- (2) Ensure that ticket transmission is functioning correctly. If not, follow the business restoration procedures listed in the PUI manual.
- (3) Screen each ticket.

Review the USA ticket for the following codes:

Table 2 - USA Ticket - Locate Type

Code	Meaning
R	Renewal
X	Extension
M	Message extended — re-mark required

Contact the excavator for extensions and renewals to determine if re-marking is actually required in accordance with the procedures listed in the PUI manual.

Determine if the ticket is a short-notice request. Short-notice codes are shown on the USA ticket and listed in Table 3.

Table 3 - USA Ticket - Locate Priority

Message	Meaning	Priority
Z	Zero hour	0
N	Less than 1 working day (10 working hours, 7 a.m. to 5 p.m.)	1
1	Less than 2 working days (20 working hours, 7 a.m. to 5 p.m. each) More than 1 working day (10 hours or more)	2

If the short-notice request is a valid emergency, process the ticket immediately. If the short-notice request is not a valid emergency, notify the excavator that the Company will be out to locate and mark the facilities within 2 working days (20 working hours). Notify the excavator that excavating ahead of locating and marking is done at his/her risk. Record the information in the USA ticket software.

Determine if Company UG infrastructure is within the area described on the ticket. If not, notify the excavator that there is no Company UG infrastructure within the area described on the ticket. Record the information in the USA ticket software.

When more than one Company USA terminal is listed on a valid short-notice ticket or if two or more locators working from the same terminal will work the ticket, notify the excavator that more than one Company locator may mark UG infrastructure within the area described on the ticket. Record the notification to the excavator in the USA ticket software.

Determine if critical facilities or any special considerations listed in Section 2.F of this standard are within the area described on the ticket. If so, conduct the additional procedures, then print and process the ticket in accordance with Section 2.F of this standard and the PUI manual.

(4) Prepare the USA information package(s) for the locator.

Print the USA tickets.

Print or copy the maps, if applicable. The preferred records are listed in Section 2.A (7) of this standard.

Forward the tickets to the appropriate department for action.

- (5) Review and process returned tickets for completeness, accuracy, and locator notes in accordance with the PUI manual procedures.
- (6) Maintain records as follows:
 - Close out each ticket in the USA ticket software and file the ticket per the PUI manual.
 - Retain all other tickets for a minimum of 5 years from the date of receipt. However, “no conflict” tickets need not be retained, unless UG infrastructures have been damaged.
 - If map copies are provided to excavators, document this in the USA ticket software.
 - Retaining copies of maps or sketches is not required unless pertinent information is documented on the map.
- (7) Run the following reports in accordance with the PUI manual:
 - “Not Sent” report. Process any missed tickets.
 - “Not Completed” or “Auto Not Completed” report. Forward “Not Completed” tickets to the mark-and-locate supervisor for resolution.

C. USA Ticket Processing Responsibilities (With Mobile Computing)

GD&TS is currently conducting a pilot test of the mark and locate process using a wireless computing system. When the system is approved and deployed to the appropriate operating departments, special instructions for ticket processing and locating will be developed.

D. Locator Responsibilities

Employees assigned the field duties of mark and locate shall perform the following:

- (1) Obtain an operator qualification per the Company’s OQ program.
- (2) Know how to operate and maintain the equipment assigned to them. The locating instrument used shall have a current verification of calibration record. Locators must take action to get repairs to equipment and notify their supervisors when their equipment is malfunctioning or when additional training may be required.
- (3) Prioritize and route work in accordance with the PUI manual.
- (4) Review tickets to verify if conflicts with Company facilities exist, and identify if critical facilities or special considerations listed in Section 2.F of this standard apply.
- (5) Contact the excavators in order to:
 - Notify them when Company employees have completed the locating and marking if locating for valid emergencies or for Company UG infrastructure on requests involving multiple departments (gas/electric transmission, gas/electric distribution, etc.).
 - Confirm standby. Follow the requirements for a standby as required by Section 2.F of this standard.
 - Arrange or confirm field meets. Field meets may be necessary:
 - For large project locate requests or ongoing projects to determine excavation schedules.

- For work in proximity of critical Company facilities.
- To determine exact excavation points on large-area, multiple-location tickets.
- At the request of the excavator.
- To perform actions required by Section 2.F of this standard.

Notify them of "no conflict" through positive response.

Notify them of a lack of work area delineation per the law. The excavator should be informed that without proper delineation, the USA ticket is invalid and they must first delineate their area and then call back into the appropriate USA center before any locating and marking. The center will send a follow-up message to all owners of subsurface facilities that the excavator has now delineated their area in accordance with the law.

Note: Although not preferred, under limited circumstances for small projects (i.e., homeowners), clear verbal instructions from the excavator can be substituted for surface delineation. This information shall be documented on the USA ticket.

(6) Perform site visits or other actions as required by Section 2.F of this standard.

(7) Notify the M&L supervisor:

Of the need for standby.

Of non-emergency or invalid short notice or zero hour tickets.

When excavators willfully disregard the law or are acting in a hostile, aggressive, or otherwise threatening manner.

When excavation is witnessed in areas where USA was not notified or where confirmation of USA notification cannot be made.

(e) When gas facilities are in conflict with the proposed excavation and the gas facilities are below overhead transmission facilities.

Note: This does not require a standby by the locator. If the M&L supervisor is not available, notify the local electric supervisor.

(f) Of any observed hazard.

(8) Contact other Company departments to perform the following:

(a) Communicate the possible need for standby.

(b) Notify them of possible hazards.

(c) Report damage to their facilities.

(d) Report that a ticket will be ongoing and turned in when complete.

- (9) Locate and mark per UO Guideline 14412.
- (a) The preferred order of methods for providing information to excavators is:
- Verhally, when surface marking is not practicable, facility records are not available, or no conflicts exist.
 - Surface markings.
 - Map copies or sketches to external entities.
- (b) When providing initial surface markings for gas distribution facilities, conductive locating is preferred. Use the following alternate methods only if field conditions preclude conductive techniques:
- Inductive.
 - Passive power (50/60 hertz [Hz]).
 - Passive - radio (14 - 22 kilohertz [kHz])
 - Acoustic (contact GD&TS).
 - E-Line™ (contact GD&TS).
 - Maps and measurements.
 - Surface indications.
- (c) Conductive techniques cannot be used in the following situations:
- Broken, damaged, or missing locating wire.
 - Contacts with subsurface installations.
 - Excessive distance from an electrolysis test station (ETS) to the area to be located.
- (d) Gas transmission lines must be located conductively. When a transmission line cannot be located conductively, the locator shall complete the checklist on the USA ticket, documenting that all possible efforts to connect to the pipe have been made. If the pipe is inductively located, the locator or QCR shall carefully probe and/or hand dig to verify the transmission line location. If probing or hand digging is not possible at the time of mark and locate because of a hard surface and the pipe is inductively located to within 5 feet of the planned excavation, every attempt shall be made to install an ETS nearby and conductively locate the pipe before excavation. The exact pipeline location must be confirmed during excavation while a QCR is present and standing by the excavation. When providing initial surface markings for electric facilities, conductive locating is preferred. Using an inductive clamp is preferred when locating electric facilities in areas where pad-mounted equipment is not readily accessible. Use the following alternate methods only if field conditions preclude the aforementioned techniques:
- Inductive locating without using the clamp.
 - Passive power (50/60 Hz).
 - Passive - radio (14 - 22 kHz).

- Maps and measurements.
 - Surface indications.
- (10) Document a positive response for each ticket.
- (a) Enter all the pertinent data on the USA ticket.
 - (b) Revise the records to communicate the corrected field data. Note and describe in the remarks section of the USA ticket that a discrepancy was found in the field.
 - (c) Sign and date the ticket.
 - (d) Forward the ticket to the appropriate department.
- (11) Facility maps shall be reviewed for accuracy and corrected as needed. The locator shall notify mapping departments of any discrepancies. Locators shall provide any additional clarification or assistance as needed.

E. Locator Responsibilities (With Mobile Computing)

GD&TS is currently conducting a pilot test of the mark and locate process using a wireless computing system. When the system is approved and deployed to the appropriate operating departments, special instructions for ticket processing and locating will be developed.

F Special Situations That Require Standby, Site Visits, and Field Meets

(1) General

- (a) Several field conditions require additional efforts by locating employees to ensure the safety of Company infrastructure. These conditions include but are not limited to:
- Agricultural activities.
 - Excavation around critical facilities.
 - Unusual construction methods such as certain boring or blasting.
- (b) Since these activities add risk to Company facilities, it is essential that additional protective measures be undertaken. These measures include:
- Standbys.
 - Site visits.
 - Field meets.
- (c) All standbys, site visits, and field meets must be clearly noted on the USA ticket and entered into the USA software.
- (d) If the Company is the excavator, standby shall be performed by a QCR not performing the excavation.

(2) Agricultural Activities

- (a) Site visits and field meets are recommended when agricultural activities are likely to damage underground facilities. These conditions include:
- An agricultural equipment operator who may not understand or is known not to

conduct safe practices around underground facilities.

- Shallow facilities likely to be overlooked by the operator.
- Deep ripping (shanks) where the depth of the shank/ripper is likely to damage even those facilities with adequate cover.

(b) Site visits and field meets should be scheduled as conditions warrant.

(3) Gas Transmission and Gas Critical Distribution Facilities

(a) Following the standby requirements of UO Guideline G14413, a QCR shall be present and observing when any of the following conditions are present:

- Any excavation activities within 5 feet of the outermost edge of any critical facility.
- Blasting is used as a means to excavate.
- Boring perpendicular to the facility.
- Parallel boring within 10 feet of the outermost edge of the facility.

Note: For electric transmission and critical electric distribution facilities, standbys shall be performed on a case-by-case basis. Standbys will be determined by the local OM&C or T/S M&C supervisor as appropriate.

(b) In addition to standbys and site visits, it is highly recommended that a field meet be held before excavating begins. At the field meet, the QCR must ensure that the excavator is aware of the location of and the danger posed by all Company underground facilities.

(c) When excavation activities are more than 5 feet from the facilities, site visits are recommended.

(d) When a parallel boring project occurs within 50 feet of gas transmission facilities, the appropriate local GSM&TS pipeline engineer shall be advised. The GSM&TS pipeline engineer shall assess the project for potential facility impacts.

(4) Unusual Construction Methods

(a) A field meet should be held when any of the following construction methods/conditions are noted around noncritical distribution facilities.

- Boring that crosses perpendicular to a facility.
- Parallel boring within 2 feet for the outermost edge of the facility.
- Slit trench cut by a rockwheel within 2 feet of the outermost edge of the facility.
- Blasting.

(b) A field meet should be considered when the supervisor determines that other unusual conditions not listed warrant such action.

G. USA Mark and Locate (M&L) Supervisor Responsibilities

The M&L supervisor shall perform the following.

- (1) Ensure that employees are properly trained and qualified under the Company's OQ program. Ensure that employees know how to operate and maintain the equipment assigned to them. Address employee concerns when equipment is not working or training is required.
- (2) Ensure that only Company-approved tools, equipment, and procedures are used.
- (3) Ensure that all locating equipment is in proper working order and that calibration has been verified in accordance with Gas Design Standard M-60.2, "Mark and Locate Instrument Calibration and Repair."
- (4) Review as necessary the employees' prioritizing and routing of work.
- (5) Monitor and manage work to ensure timeliness and quality.
- (6) Conduct periodic quality assurance reviews in accordance with the PUI manual.
- (7) Review employee timecards for accuracy in accounting and hours worked.
- (8) If necessary, contact excavators, and develop action plans:
 - (a) For short notice, zero hour notice, or invalid emergency requests.
 - (b) For multiple instances of no delineation (white paint) at the work area.
 - (c) For small or numerous excavations compared to a large locate request.
 - (d) When multiple Company locators or departments are needed.
 - (e) To coordinate a standby.
 - (f) To facilitate field meets at the request of the locator. This may be accomplished through a designated representative.
- (9) Notify the T/S M&C line supervisor if the proposed excavation is beneath overhead electric transmission facilities.
- (10) Ensure that any required standby, field meet, or site visit is performed.
- (11) Ensure that the required root cause analysis is performed for Company at-fault dig-ins.
- (12) Respond to inquiries from the office that processed the ticket. Act or appoint a designated representative to act as single point of contact in the field for outstanding tickets and tickets not sent.
- (13) Ensure that Company records provided to locators are current.
- (14) Establish a specific schedule or arrangement of follow-up visits for projects with one or more of the following conditions:
 - (a) Installation of conduits large enough for a person to enter.
 - (b) Installation of small conduits in conjunction with substructures large enough for a person to enter (e.g., manholes or vaults).

- (c) Installations where construction that parallels or crosses Company facilities will be continuing over an extended period.
 - (d) Installations in close proximity to critical facilities or where excavations may impact the integrity of the facilities.
- (15) If excavation includes blasting operations, and damage to gas facilities is suspected, perform a special gas leakage survey in accordance with UO Standard D-S0350, "Leak Survey and Repair of Gas Transmission and Distribution Facilities."
- (16) Assist with the investigation of damage by excavators.
- (17) Be aware of and take action to resolve observed hazards (see SH&C Procedure 104, "Observed Hazard Notification: Third Parties").

H. USA M&I, Supervisor Responsibilities (With Mobile Computing)

GD&TS is currently conducting a pilot test of the mark and locate process using a wireless computing system. When the system is approved and deployed to the appropriate operating departments, special instructions for managing this process will be developed.

I. The M&L USA Ticket Processing Supervisor Responsibilities

The supervisor responsible for ticket processing shall perform the following:

- (1) Ensure that USA-related hardware and software are functioning properly.
- (2) Ensure that the USA ticket-processing responsibilities, which include required report preparation, are followed.
- (3) Ensure that employees are properly trained. Conduct periodic reviews of employees for task proficiency.
- (4) Verify that follow-up reports and procedures are being accomplished in accordance with Section 3 of the PUI manual.
- (5) Ensure that updates or corrections to the terminal boundaries are completed and transmitted to the appropriate USA center.
- (6) Monitor and manage production and quality. Review employee timecards for accuracy in accounting and hours worked.
- (7) Ensure that records are properly maintained.

J. The M&L USA Ticket Processing Supervisor Responsibilities (With Mobile Computing)

GD&TS is currently conducting a pilot test of the M&L process using a wireless computing system. When the system is approved and deployed to the appropriate operating departments, special instructions for managing this process will be developed

3. Requesting Information and Avoiding Damage to Subsurface Installations When the Company Is the Excavator

A. Requesting Information on Subsurface Installation Locations

- (1) Notify USA for all excavation projects including those on private property, long-term projects in subdivisions, the completion of stub services and in-place pole replacements. The Company employee responsible for the excavation shall contact USA at least 2 working days, but not more than 14 calendar days, before commencing any planned excavation. Planned excavation shall not take place until positive response has been obtained for all USA members listed on the ticket. Under no circumstances shall any Company employee auger any pole or drive any anchor or ground rod until all subsurface facilities have been located and marked by the owner/operator of the facility.
- (2) Before the Company commences any planned excavation, verify the location of subsurface installations owned and operated by other companies, municipalities, or other governmental agencies by calling USA or the owners of the facilities if they are not members of USA.
- (3) In an emergency, the Company employee responsible for the excavation shall make a reasonable attempt to contact USA and any known facility owners that may have subsurface installations in the area before excavating. Excavation may commence ahead of locating and marking by the subsurface facility owner/operator at the discretion of the Company.
- (4) A copy of the active USA ticket shall be included with all job folders.
- (5) Delineate the boundaries of the project per UO Guideline 14412 and the PUI manual. Work shall be confined to the delineated area. Work outside of that area is considered a new project and USA must be notified to issue a new ticket.
- (6) Notify USA after the 2 working days (20 working hours) have elapsed and an owner/operator of a subsurface installation fails to provide markings or information about their facilities. Provide USA with a field contact phone number and request that the owner/operator contact the responsible Company employee immediately. USA will send a no-response follow-up to the owner/operator who failed to respond. If after 1 hour has elapsed from the follow-up call:
 - (a) Document the no-response follow-up on the USA ticket.
 - (b) Conduct a site survey for the presence of subsurface installations in accordance with Section 10 the PUI manual. If subsurface installations are within the excavation area, do not excavate. Contact the local OM&C or GSM&TS supervisor for resolution.
 - (c) If no subsurface installations appear to be within the white-delineated work area, conduct an initial excavation (pothole), using the procedures in UO Guideline 14413, "Procedure for Excavating Pipelines and Services" to the required depth of excavation. If no subsurface facilities are found after using this procedure, excavate with power-operated equipment. If subsurface facilities are found, do not continue excavation until the facilities are located and marked by the owner. Contact the local OM&C or GSM&TS supervisor for resolution.

Note: The crew may elect to not remain on site. The crew can be dispatched to other work; however, a no-response follow-up shall be generated before excavating at

the site.

- (6) During construction, take care to maintain surface markings. If field markings are no longer visible, renotify USA to have its members re-mark their underground facilities.
- (7) If construction is expected to last beyond the valid date of the USA ticket, call USA at least 2 working days before the expiration date to extend the ticket.
- (8) Each OM&C operating headquarters shall maintain a current and accurate listing of names, telephone numbers, and other necessary information about the owners of other subsurface installations. This will allow first-hand contact with them, if necessary, in after-hours situations. Usually, this information can be found in the local emergency manuals.
- (9) Obtaining information and drawings and contacting USA should be delegated to a specific individual to ensure that these arrangements are completed before beginning construction. Every employee performing the actual excavation shall confirm that these arrangements have been made before commencing any excavation. Lack of delineation, white paint, or facility surface markings may indicate that the proper notification to USA has not been made, or that facility owners have not responded.

B. Excavating Over Subsurface Installations and Company UG Infrastructure

- (1) Where excavating within the approximate location of any known subsurface installation or any UG infrastructure, determine their exact locations by hand digging or where permissible vacuum excavation, to expose the facilities before using power-operated equipment. Probing must be used in conjunction with hand digging as a means to determine depth and general location. Use field markings, locating equipment, or facility records to determine their locations. If maps or surface indications are used to locate a facility, the exact location of the facility must be determined by careful hand digging or probing before power-operated equipment is used.
- (2) Where direct-buried electric cables are present or may be present, use caution and hand dig only. Use UO Guideline 14413 for the appropriate procedures. Using probes to locate direct-buried electric facilities is not permitted. Exercise extreme care when probing to physically locate and expose gas facilities. Using impact or slide probes is limited to prospecting steel gas facilities.
- (3) While the use of vacuum excavating equipment is an acceptable method to determine facility location, it must be used carefully. Vacuum excavating units, which use air or water nozzles, generally do not damage underground facilities, but should be used with caution. It is recommended to limit the nozzle pressure to less than 125 psig and not leave the nozzle in direct contact with the facility for more than a few seconds. At no time shall high-pressure water or air jets (operating greater than 125 psig) be used within 12 inches of the outside wall of any gas or electric transmission facility. If higher pressures are required, contact the facility owner for guidance on acceptable nozzle pressures.
- (4) When boring, use careful probing and hand digging to determine the exact location of UG infrastructure. Where the exact location cannot be determined by careful probing, expose the UG infrastructure by using hand tools for visual examination. When using horizontal drilling/boring/auguring or tunneling technologies to install Company UG infrastructure,

determine the location of all known subsurface installations, Company UG infrastructure, or other structures including nonpressurized sewer lines, nonpressurized storm drains, or other nonpressurized drain lines that are in close proximity to the proposed installation.

When using these technologies to install facilities parallel and in close proximity to those substructures listed above, prospect and determine the exact location of those substructures at a minimum of every 100 feet to verify during installation that the new facilities do not encroach on any subsurface installation. Reduce the interval between prospect locations to a maximum of 50 feet when the substructures being paralleled are known to carry hazardous, combustible materials and/or electric facilities operating at or above 60 kV or any gas or electric facility identified as critical.

- (5) Using Power-Operated Equipment Over Company UG Infrastructure
Follow UO Guideline 14413, "Procedure for Excavation Pipelines and Services."
- (6) Except for the removal of pavement where no facilities are contained therein, approval to use power-operated equipment over subsurface installations, including nonpressurized sewers, storm drains, and other drain lines, rests with the facility's owner or a designated representative. Except for the no-response provisions in this standard, no excavations with power-operated equipment shall be made before obtaining permission from the owner or operator of the subsurface installation.
- (7) If the location of subsurface installations or UG infrastructure cannot be adequately determined by excavating, request additional information from the operator or affected Company department. For subsurface installations, notify USA and request a follow-up message to the owner/operator that its facility cannot be located.
- (8) The crew must be aware of any field conditions that suggest that the information provided is inaccurate or incomplete. Such conditions may be pole risers, unaccountable paving cuts, service locations, etc. Carefully investigate these conditions and program the work in a manner that will minimize the chance of possible injuries or damages.

4. Contractor Compliance Efforts: Handling Noncompliant Excavators and Damage Prevention Initiatives

- A. Excavators have the obligation to work safely around utility facilities—both underground and overhead facilities. This includes their obligation to call USA at least 2 working days before excavating. There are various sanctions that can be taken against a noncompliant contractor, many involving government entities that can affect the contractor's license or ability to work. Although these are available, the primary goal is to get the contractor to work safely and follow all necessary regulations around utility facilities.
- B. The SH&C department administers a systemwide Contractor Compliance Program, centrally managed by the Company's public safety program manager. The program's intent is to change the behaviors and performance of noncompliant contractors when working around gas and electric facilities. The program tracks overhead and underground contacts by third-party contractors who fail to follow applicable laws and engage in unsafe work practices around utility

facilities. Steps that may be taken to gain contractor compliance are included in The Action Pyramid (see the PUI manual, Section 9, "Handling Noncompliant Contractors").

- (1) The Action Pyramid identifies a series of actions to take with noncompliant contractors. These actions generally include meeting with repeat-offending contractors and notifying the local permitting agency, the Contractors State License Board or California Occupational Safety and Health Administration (Cal/OSHA). These actions are based on the frequency and/or severity of the incident(s).
- (2) Contractors who fail to follow California Government Code Section 4216 may also be liable for civil penalties. If they negligently violate this Code, they are subject to a penalty of up to \$10,000. If contractors knowingly and willfully violate this code, they may be subject to a penalty of up to \$50,000. These enforcement actions are pursued by the local district attorney's office or state attorney general's office in cooperation with the Company's Law department.

C. Steps for Achieving Contractor Compliance

The following actions are taken by the public safety manager to gain compliance with safe work practices:

- (1) An annual direct-mail offer of safety training materials is sent to contractors throughout the Company's service territory. Materials requests are fulfilled centrally through SH&C.
- (2) A letter to the noncompliant contractor is sent when an incident occurs, notifying the contractor of the requirements when working around utility facilities, providing the relevant laws and work practices, and offering safety materials.
- (3) If incidents continue, the contractor's management is contacted in person or by telephone, explaining the unsafe work practices and the steps needed to gain compliance. A follow-up letter is sent to the contractor describing the actions agreed to during the discussion.
- (4) Should incidents continue to occur, a final letter is sent to the contractor notifying it that the matter is being referred to the Contractors State License Board (CSLB), the Cal/OSHA, the contractor's insurance company, and/or local permitting agencies.
- (5) As a final step, the Company may request prosecution by a local district attorney. This decision shall be made in conjunction with the Company's Law department.
- (6) The following actions are taken by the operating departments to ensure compliance with safe work practices:
 - (a) The ticket-processing department shall maintain an updated list of all current noncompliant excavators sent by SH&C.
 - (b) Noncompliant excavators will be added or removed to this list when notified by SH&C. If operating areas identify a potential noncompliant excavator for this list, they should contact the public safety manager.
- (7) When a ticket processor receives a USA ticket from a noncompliant excavator, the ticket shall be identified for a site visit using the phrase, "NONCOMPLIANT EXCAVATOR" prominently on the face of the ticket before it is forwarded to the locator.

- (8) During the initial locating activities, the locator shall:
 - (a) Ensure that the excavation delineation is accurate and reasonable for the work being conducted.
 - (b) Note any conditions that may obscure or obliterate marks.
 - (c) If the excavator is on site, discuss safe working practices with the excavator. The discussion must be noted on the USA ticket and entered into the USA software.
 - (9) The locating supervisor shall ensure that QCRs are dispatched to make, unannounced visits to the excavation site after the area is located. All site visits must be noted on the USA ticket and entered into the USA software.
 - (10) The original ticket and associated drawings, sketches, or maps are retained for a minimum of 5 years from the date the facilities were located.
- D. For incidents involving damage to Company UG infrastructure caused by excavators, the appropriate OM&C, T/S M&C, ET&DE, and GSM&TS departments shall take the following action:**
- (1) Review the incident to determine the apparent cause. Identify any trends and lessons learned.
 - (2) Document the incident in IGIS in accordance with UO Standard S0350.
 - (3) Complete an Incident Report and input it into the RiskMaster Claims Database within 7 calendar days from the date of incident.
 - (4) Bill the excavator for damages and collect per USP 21, "Damage Claims Collection."
 - (5) Respond to inquiries from internal Company departments, the California Public Utilities Commission (CPUC), and the U.S. DOT. Provide damage photographs, incident reports, and supporting documentation as appropriate.
 - (6) Take the appropriate steps to prevent future damage by the excavator, including additional training, discipline, and other actions as described above.
- E. Additional Damage Prevention Measures**
- (1) Encourage city and county agencies to ask persons applying for permits (by so noting on the permits) to notify USA before starting work. City and county agencies should be advised that permits are not valid unless accompanied by valid initial inquiry identification.
 - (2) Take reasonable steps to remind contractors, public agencies and others to notify USA at least 2 working days in advance of work they have pending.
 - (3) Use every reasonable effort to ensure that all excavating entities are aware of the legal requirements and the consequences of damaging Company facilities. Venues such as Safety Awareness for Excavators (SAFE) seminars, industry meetings/conferences, and other community events are ideal locations to educate the excavators and the general public.
 - (4) The approval to use power-operated equipment by an excavator over company UG infrastructure shall rest with the OM&C, T/S M&C or GSM&TS superintendents. The excavator shall follow the provisions of UO Guideline 14413. No blanket agreements shall be made. In cases where equipment loading or reductions in cover may endanger Company UG

infrastructure, the E&P gas operations engineer, ET&DE engineer or GSM&TS engineer shall review, evaluate, and approve such equipment use and require remedial actions such as an additional cover, concrete caps, or street plates.

- (5) For other than Company excavations, a QCR shall verify that the GSM&TS district superintendent, T/S M&C superintendent, area OM&C superintendent, or a designated representative and the excavator have mutually agreed to allow the use of power-operated equipment in addition to hand digging and probing.

5. Responding to External Requests for UG Infrastructure Information for Design Purposes

A. General

- (1) Company records contain confidential and proprietary business information about Company UG infrastructures and their locations. UG infrastructure information should be made available to others only in very limited circumstances. Provide information pertaining only to the specific project.
- (2) Do not give information or copies of any portion of facility records to any outside entity or Company affiliate unless:
 - (a) It directly benefits the Company's work.
 - (b) It is needed to ensure public safety.
 - (c) There is reasonable certainty the information provided will not compromise the safety or reliable operation of the facility.
 - (d) It is needed for compliance with legal requirements.
- (3) The following are some examples of when data may be provided to others:
 - (a) UG infrastructure information is required for design of new business installations.
 - (b) A telecommunication and cable television Company requests information and access to evaluate the availability of surplus space or excess capacity on support structures and UG infrastructure.
 - (c) UG infrastructure information is needed for facility modifications, relocations, etc. (i.e., joint pole).
 - (d) Caltrans or other governmental agencies require UG infrastructure information for public works project design.
 - (e) Gas and/or electric UG infrastructure are being relocated for public works projects.
 - (f) Agencies must be notified of deactivation of specific UG infrastructure as required by franchise agreements.
- (4) Follow the provisions of Section 1 of this standard before providing any portion of Company facility records to external entities.
For all design inquiries, release to the applicants or their agents only that portion of the facility records (or the drawing made from the map) that is required for their design.

- (5) If gas and /or electric transmission facilities or critical distribution facilities are impacted, notify the affected area GSM&TS pipeline engineer, ET&DE engineer, the E&P gas operations engineer, and the appropriate land agent.
- (6) Deny general requests from any external entity or other gas and electric utility (public or private) for maps of portions of the Company's system if they are proposing no specific project.
- (7) Exceptions to the above may be considered for valid business reasons and should be evaluated on a case-by-case basis. The appropriate area OM&C director, ET&DE director or GSM&TS director or their designated representative must approve exceptions.

B. Responding to Specific Public Agency Requests for Work in Franchise Areas

- (1) Review the information requests from governmental or public agencies. Generally, these requests should be for work or projects involving connection to, relocation/rearrangement, or abandonment of the Company's UG infrastructure. Providing location information for Company UG infrastructure during the design phase of city and county agency projects may reduce impacts upon Company facilities while reducing construction costs to agencies. The Company should foster this type of collaborative approach. The Company should accommodate all agencies that have shown a willingness to mitigate potential conflicts during the design phase of projects.
- (2) Provide information on the location of deactivated UG infrastructure when available.
- (3) Information requested for planning or design purposes typically should be given in the form of map copies and sketches. Record on the request the date that the maps were given and retain a copy of the requesting agency's letter. Surface markings will not be provided until construction is ready to begin, and timely notification from USA is received. In all cases where maps are requested by a public agency, all map copies must be stamped with the nondisclosure stamp shown in Section 2.A.8 of this standard.