

PG-E**FOR INTRA-COMPANY USES**

DIVISION OR
DEPARTMENT
FILE NO.
RE LETTER OF
SUBJECT

GAS OPERATIONS-ELECTRIC OPERATIONS

449-1

Rules for Working Near
Underground Electric Cables

November 18, 1968

DIVISION MANAGERS
MR. C. H. SEDAM

The attached Standard Practice 449-1, "Rules for Working Near Underground Electric Cables" has been revised to include procedures for joint trench construction and direct buried cables.

The revision also provides for advance notice between Gas and Electric Departments prior to any scheduled excavation work adjacent to underground cables or gas pipes. It requires that both the gas and electric job sketches denote the existence of buried gas, electric, telephone, etc., facilities adjacent to the proposed excavation.

It is suggested that copies of this Standard Practice be distributed to Engineering, Operating and Construction Supervisors.


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Attachment

cc Officers
Department Heads
Division Gas Superintendents
Division Electric Superintendents

PACIFIC GAS AND ELECTRIC COMPANY
STANDARD PRACTICE

STANDARD PRACTICE NO. 449-1

EXECUTIVE OFFICE OR DIVISION GAS AND ELECTRIC OPERATIONS
GAS DISTRIBUTION

PAGE NO. 1 EFFECTIVE 11-18-68ISSUING DEPARTMENT ELECTRIC TRANSMISSION AND DISTRIBUTIONREPLACING PAGE NO. 1 EFFECTIVE 7-1-57

SUBJECT:

RULES FOR WORKING NEAR UNDERGROUND ELECTRIC CABLES

PURPOSE

- 1.* This Standard Practice outlines the Company procedures to be followed when trenching, excavating, or working on underground structures such as manholes, vaults, gas pipes, ducts, conduits, etc., which are in close proximity to electric distribution cables or equipment.
- 2.** The purpose of this Standard Practice is to provide the general safety precautions which must be followed when working in close proximity to electric cables. Procedures for working on energized electric equipment are covered by Standard Practice 449-2, the General Operating Instructions, and the Accident Prevention Rules.

RESPONSIBILITY

- 3.** The responsibility for implementing the procedures in this Standard shall rest with the Division and District Gas and Electric Superintendents.
- 4.** Training or instruction sessions to cover these instructions shall be conducted jointly by Gas and Electric Department Supervisors.
- 5.** Deviations to the detailed procedures established in the supplement to this Standard Practice may be authorized by Division or District Gas or Electric Superintendents only when warranted in specific instances. The Division Superintendents shall keep the appropriate General Office Gas or Electric Operating Department informed of the nature and frequency of these deviations.

REFERENCE

- 6.** The detailed procedures to be followed are outlined in the supplement to this Standard Practice.

APPROVED BY: H. P. BRAUN - VICE PRESIDENT, ELECTRIC OPERATIONS
 E. H. FISHER - VICE PRESIDENT, GAS OPERATIONS

SUGGESTED DISTRIBUTION: EXECUTIVE OFFICERS
 DIVISION AND DISTRICT MANAGERS
 GENERAL OFFICE AND DIVISION DEPARTMENT HEADS
 DIVISION GAS AND ELECTRIC SUPERVISORS
 GENERAL CONSTRUCTION SUPERVISORS

ADDITIONAL COPIES: Additional copies of this Standard Practice may be obtained from the Transmission and Distribution Department, Electric Operations, P. G. and E. telephone extension 1467.

7.** General

- A. Primary voltage underground cables are generally constructed with a shield over the cable insulation. This shield is grounded and may consist of concentric neutral wires, copper shielding tape, lead jacket, etc. A nonmetallic jacket often covers the entire cable. Such a grounded shield offers protection to anyone who may accidentally damage a primary voltage cable. Unshielded primary cables may be encountered in substations, older underground systems, and in underground series street lighting circuits.
- B. Secondary voltage cables are generally not shielded.
- C. Both primary and secondary voltage cables are either installed in metallic or nonmetallic conduits, duct banks, or directly buried in the ground. Cables in manholes are installed on supports inside the manhole.
- D. Both primary and secondary voltage cables are connected to electric equipment in manholes, vaults, subsurface enclosures, and padmounted enclosures. Only qualified Division Electric Department or qualified General Construction Electric personnel are authorized to enter and work in these manholes, vaults, and subsurface enclosures, unless the facilities have been made safe for work as specified in Paragraph 13.
- E. Cables may be inserted into splice boxes or handholes containing cables energized at less than 750 volts by Gas Department employees provided they have been instructed in the proper procedures and precautions to be followed.
- F. The installation of gas and electric facilities in joint trench construction shall adhere to the clearances between facilities set forth in the current Engineering Standard Drawing No. 040686 "Trench Requirements for URD Cable, Residential Underground Systems."

8.** Notification

- A. Advance notice shall be given to the Division or District Electric Department by either the Gas Department or the General Construction Gas prior to any scheduled excavation work adjacent to electric cables or prior to breaking out of ducts, rebuilding electric manholes or any other work required adjacent to underground electric cables or equipment. Conversely advance notice shall be given to the Division or District Gas Department by either the Electric Department or the General Construction Electric personnel prior to any scheduled excavation work adjacent to gas pipes.
- B. When emergency work is required, notification shall be given as promptly as possible.
- C. Advance notification permits review of work procedures for possible hazards and facilitates arrangements for personnel to protect the gas or electric facilities if deemed necessary by Division or District Operating Departments.

9.** Locating

- A. Before any scheduled or emergency excavating is performed, the location of adjacent underground electric, telephone and/or other cables and pipes must be determined.

B. The gas and electric job sketches shall denote the existence of buried gas, electric, telephone, etc., facilities adjacent to the work area.

C. The exact location of these facilities must be determined and/or marked on the surface if they are in close proximity to the proposed excavation.

10. ** Excavating

A. If the depth of all buried facilities in a joint trench is definitely known, power digging equipment may be used for excavating all but the last 12 inches of cover over the facility. The remaining cover shall be removed by use of wooden handle or similar insulated hand digging tools. Where the depth of facilities is not established, power digging equipment cannot be used except to break and remove the surface pavement.

B. Probe rods or bars shall not be used to locate any underground facilities. Use of these tools in order to facilitate other work such as leak surveying or bar holing shall be limited to surface paving penetration with a maximum boring depth of 12 inches in the immediate vicinity of underground electric or telephone facilities.

C. Before boring or jacking pipes or conduits, all underground facilities in close proximity to the work shall be located and those facilities in the path of the bore shall be exposed. The horizontal location and progress of the boring operation shall be known at all times.

11. ** Protecting Direct Buried Cables

A. When uncovering direct buried cables, extreme care must be observed to avoid damaging the cable insulation.

B. All exposed cables in a work area should be protected against damage by wooden boards or other nonconductive materials. Where welding is required adjacent to protected cables, suitable nonflammable protective material shall also be utilized.

C. Under no conditions should workmen stand on unprotected cables.

12. * Breaking Out Ducts

A. Only personnel who have been instructed in the proper methods shall be allowed to break duct envelopes. When breaking out duct envelopes, smooth pipe shields shall be inserted over cables in all ducts to protect cables from accidental damage. When a duct envelope, having no open end for the insertion of pipe shields, is to be broken out, a section of sufficient length to accommodate a short shield shall be first broken, using pneumatic tools no larger than a chipping hammer.

B. Slight movement of cables (see Paragraph 14) to permit the insertion of pipe shields is permissible. This moving of cables shall only be performed

by men who are qualified to break duct envelopes, and the movement shall never exceed the minimum required to insert the shields.

C. If damage is done at any time to any cable sheathing, regardless of how slight it may appear, it shall be reported immediately to the Division Electric Department. As cables are exposed, they should be closely observed for damage, deterioration, cuts, etc., and immediately reported.

D. As ducts are broken from around a section of cable, the Electric Department shall be notified to wrap or otherwise suitably protect and support the exposed cable unless the work is being performed by a qualified General Construction Electric cable crew, in which case they may proceed with such work. Crew Foreman shall report on and off to the man holding a clearance or non-test order as required for the performance of the work (see Paragraph 15).

13.* Breaking Out Manholes, Vaults, etc.

A. In the case of work in manholes, vaults, etc., the enclosure shall be tested for gas prior to entrance of the crew. The Division Electric Department or qualified General Construction Electric personnel will inspect all electric equipment at the location, check any wrapping on presently wrapped cables, and wrap or otherwise suitably protect or barrier, for the purpose of the work, all cables energized at 750 volts or higher. A tag, dated and signed, indicating what was done shall be posted in a conspicuous place at the completion of the inspection. This tag shall be removed after completion of the work.

B. When the crew arrives at the location to start work, the foreman shall test for gas and check to see that cables have been inspected. It is to be noted at this point that wrapping does not afford any electrical protection and very little mechanical protection. The major purpose served by the wrapping or protection specified in Paragraph A above is to identify all cables which carry 750 volts or higher as referred to in Accident Prevention Rule No. 707, and is not to preclude the provision for barricades or other necessary safety precautions.

C. Even though cables are wrapped, cable sheathing could be punctured by a pointed object and the wrapping might hide such damage. Thus it is important that damage be prevented, and, if it should occur, shall be reported and repaired immediately. This reporting of damage to cable sheathing is of utmost importance to all men working near these cables. It is primarily for their protection. Even though nothing may happen at the time, later cable failure may result in service interruptions.

14.* Moving of Cables

A. Movement of cables energized at over 750 volts any appreciable amount (in excess of one inch) or tying to supports shall be done only by qualified Division Electric Department or General Construction Electric personnel. Cables energized above 7,500 volts shall only be moved under the direction of the Division Electric Supervisor in charge.

B. Movement of cables energized at less than 750 volts should be limited to qualified personnel who have been instructed in the proper methods to move secondary voltage cables.

15. ** De-energizing

A. Cables should be de-energized if practicable when they will be exposed by the excavation work. A qualified Division Electric Department or General Construction Electric employee shall hold the necessary clearance on the cable or cables while the work is being performed or until the cables are suitably protected as per Paragraph 11 or 12.

B. When impracticable to de-energize cables, a qualified Division Electric Department or qualified General Construction Electric employee may require a non-test order on the cable or cables until the cables are suitably protected or the work completed.

C. In situations when escaping gas or other explosive hazards make it impossible to adhere to the provisions of this Standard Practice, the electrical facilities in the work area shall be de-energized by qualified Division Electric Department personnel.