PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

SAFETY AND ENFORCEMENT DIVISION
UTILITIES SAFETY BRANCH

RESOLUTION SU-33
Date: July 6, 1995

R E S O L U T I O N

RESOLUTION SU-33. ORDER AUTHORIZING DEVIATION FROM GENERAL ORDER NO. 112-D, SECTION 192.321 (a), ALLOWING GAS OPERATORS TO INSTALL PLASTIC GAS PIPE ABOVE GROUND LEVEL ACROSS BRIDGES.

SUMMARY

1. By letter dated April 20, 1995, San Diego Gas and Electric Company (SDG&E) requested that the Commission authorize a deviation from General Order No. (G.O.) 112-D, Section 192.321 (a), requiring plastic gas pipe to be installed only below ground level.

2. This deviation would allow installation of plastic gas pipe, encased in steel pipe, above ground level across bridges. Under this deviation, plastic material used in above ground level installation/construction of gas piping must meet manufacturer's recommendations, guidelines and specifications for such installation. Plastic pipe tie-in connections across a bridge must be fusion-type joints, and must conform to G.O. 112-D requirements related to construction and joining of plastic pipe.

3. This Resolution authorizes the deviation for all investor owned gas utilities in the State of California.

BACKGROUND

1. Public Utilities (P.U.) Code Sections 702 and 768 grant the Public Utilities Commission (Commission) authority to establish and enforce standards of construction, maintenance and operation of utility systems. Rules governing design, construction, testing, maintenance and operation of utility gas piping systems are codified in G.O. 112-D.

2. The Utilities Safety Branch (USB) oversees utility compliance with G.O. 112-D. Section 192.321 (a) of G.O. 112-D states: "Plastic pipe must be installed below ground level".

3. G.O. 112-D, Section 105, "Deviation from the rules", authorizes the Commission to grant a waiver of a rule providing that such waiver be accompanied by full and complete justification.

DISCUSSION

1. Principal concerns for installing plastic gas pipe below ground level are that temperature, ultraviolet light from the sun and thermal stress may cause plastic pipe to deteriorate.

2. SDG&E proposes to install polyethylene (P.E.) pipe encased in steel pipe across bridges. SDG&E also proposes to coat the steel pipe so as to prevent atmospheric corrosion.

3. SDG&E feels justified in requesting this waiver because, through application of proper design techniques and its present installation standards, safety hazards associated with installation of P.E. pipe above ground level can be eliminated.

4. Along with the petition, SDG&E submitted studies conducted by the Plastics Pipe Institute, American Gas Association, Gas Research Institute and other gas utilities, showing that P.E. pipe can be safely installed above ground level across bridges.

5. Advantages of installing P.E. pipe above ground level across bridges are as follows:

a) Constructing a P.E. pipeline across a bridge is an environmentally beneficial alternative rather than trenching through a stream bed to bury the pipeline.

b) In California, operators install gas pipes across bridges or highway overpasses designed for movement in the event of an earthquake. The more flexible P.E. pipe will resist bridge seismic movement better than steel pipe.

c) A P.E. pipeline approaching a bridge is required to make a transition to a non-plastic pipeline at the bridge crossing. The transition involves careful and costly engineering design and construction which can be avoided if the P.E. pipeline is made continuous.

d) Installation and maintenance costs for P.E. pipelines across existing bridges are lower than those for steel pipelines. Installation costs for P.E. pipe are roughly half those for steel. Maintenance costs for P.E. pipe are almost negligible.

e) P.E. gas pipelines can be installed safely and cost-effectively across newly-constructed bridges.

6. Disadvantages of installing P.E. gas pipe above ground level across bridges are as follows:

a) Temperature changes affect the load-bearing capacity of plastic materials. Effects of temperature changes on these mechanical properties must be considered when a P.E. pipe system is designed. Metal casing exposed to direct sunlight could become heated to higher than ambient temperature; therefore, P.E. pipe that is installed above-ground inside a protective metal casing may experience considerably higher temperature than buried pipe.

b) Temperature changes lead to thermal stresses which are proportional to the difference between current temperature and temperature at time of installation. Thermal stresses act on pipe and on fittings at joints.

c) Ultraviolet light from the sun, can cause P.E. pipe to deteriorate.

To eliminate the danger of exposing above ground level P.E. pipe to ultraviolet light, P.E. pipe should be encased in steel pipe. The steel pipe should be coated to prevent atmospheric corrosion.

To eliminate temperature effect on P.E. pipe due to contact with its steel casing, an investigation performed by Plastics Pipe Institute showed that temperature effect can be minimized to a level lower than the maximum allowed by G.O. 112-D if a separation of at least 1/6 inch is maintained between the P.E. pipe and its steel casing.

To minimize the effect of thermal stress on joints, SDG&E will be using fusion (instead of mechanical) joints for tie-in connections, or, in lieu of joints, P.E. pipe inside steel casing will be one piece with no connection joints.

The American Gas Association (AGA) Gas Piping Technology Committee presently has a petition with U.S. Department of Transportation (DOT) to change the wording of Title 49 of CFR Section 192.321 (a) (adopted by G.O. 112-D), to allow plastic gas pipe to be installed above ground level across bridges. AGA is confident that such a change will not pose any safety problems.

The U.S. DOT has already granted three waivers for installing plastic gas pipe above ground level across bridges. The following three waivers were identified:

1. In 1985, commonwealth Gas Company in Massachusetts.
2. In 1984, Consumers Power in Michigan.
3. In 1979, National Fuel Gas Corporation in New York.

FINDINGS

1. The USB staff, of the Safety and Enforcement Division, has reviewed SDG&E's petition and concurs with SDG&E's request for deviation.

2. Studies and results obtained from similar projects, involving aboveground P.E. pipe installations across bridges, showed no indications of unsafe operations or any safety hazards associated with such installations.

3. Seismic safety considerations suggest that P.E. pipe installations across bridges will increase the gas system's ability to withstand seismic events.

4. P.E. pipe installations cost less than steel pipes and require little or no maintenance.

5. The deviation should be granted to all regulated gas utilities so as to afford all of them an opportunity to implement this cost-saving, seismic-resilient costruction practice in their service areas.

THEREFORE, IT IS ORDERED THAT:

1. Gas operators may deviate from G.O. 112-D, Section 192.321 (a), by installing P.E. gas pipe, encased in steel pipe, above ground level across bridges, provided that the following conditions are adhered to:

   a) The steel casing of the P.E. gas pipe shall terminate below ground level at both ends of pipe.

   b) No portion of a P.E. gas pipeline shall be exposed to ultraviolet light for any period of time.

   c) P.E. pipe must not touch the wall of the metal casing. Provisions must be included to assure that an annular space of at least 1/3 inch is maintained.

   d) Joints made on the above ground level P.E. pipe shall be fusion type joints.

   e) Gas operators shall monitor, at location, temperature levels on the P.E. gas pipe during the colder and warmer months of the year for at least three years, and shall leak survey above ground level P.E. gas pipe at least twice a year.

   f) Gas operators shall report any construction, operation or maintenance problems, related to the above ground level P.E. pipe across bridges, to the Commission, and shall notify the Commission of such installations at least two weeks prior to start of construction.

2. Gas operators shall report to the Commission any further studies (performed by a manufacturer/Association/Institute or any accredited company), whether supportive or not, on the installation of P.E. pipe above ground level.

3. This Resolution is effective today.

I hereby certify that this Resolution was adopted by the Public Utilities Commission at its regular meeting on July 6, 1995. The following Commissioners approved it:

Wesley Franklin

Wesley M. Franklin
Acting Executive Director

DANIEL Wm. FESSLER
President
P. GREGORY CONLON
JESSIE J. KNIGHT, Jr.
HENRY M. DUQUE
Commissioners