



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Staff P-315

Date: December 16, 1996

In reply refer to: P-96-26 through -30

Honorable Pedro Rosello
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Governor's Office
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About 8:30 a.m. on November 21, 1996, an explosion occurred in the Humberto Vidal shoe store and office building at 100 Jose de Diego Calle in Rio Piedras, Puerto Rico. Local emergency agencies responded and initiated search and rescue operations. By December 5, 1996, 30 fatalities had been confirmed, and 5 people, believed to still be in the building ruins, were missing. Local authorities have suspended search efforts until the building can be made safe for rescue workers.

The National Transportation Safety Board interviewed numerous citizens during its on-scene investigation between November 21 and December 6, 1996, to determine their knowledge about events occurring before, during, or after the November 21 explosion. The Safety Board also performed subsurface tests in the vicinity of the destroyed and damaged buildings to determine the location of combustible materials and damaged pipelines in the subsurface. As a result of these efforts, the Safety Board identified three areas involving public safety that need immediate attention: public education on action to take when the odor of gas is detected; protection of buried facilities from excavation damage; and validation and updating of maps identifying the location of buried facilities.

During its interviews with eyewitnesses and other observers, the Safety Board learned that several people in the Humberto Vidal building and adjacent areas had detected the odor of gas before the explosion. Because they did not perceive the odor as a potential danger to themselves or to others, they did not report their observations to the San Juan Gas Company (SJGC) or to local emergency agencies. Several people in the area did realize that the gas odor represented a potential danger and notified the SJGC; however, they did not know that other actions, such as evacuating buildings, should be taken to protect themselves and others.

The Safety Board is aware that the SJGC has a public education program to advise gas users and nonusers about actions that should be taken when the odor of gas is detected. That program includes newspaper advertisements, distribution of information flyers to customers, and

presentations before community groups. However, based on the Safety Board's interviews, it is apparent that the SJGC education program has not been effective. Consequently, the Safety Board believes that further action is needed to educate citizens about the potential danger to their safety when the odor of gas is detected and about actions that should be taken immediately for their personal safety and for the safety of the general public.

Based on findings from combustible indication tests, several SJGC gas lines were excavated to determine the condition of gas lines in the accident area. Those excavations included about 50 feet of pipelines beneath Calle Camelia Soto (north/south street) and Calle Arzuaga (east/west street). In an excavation in Calle Arzuaga south of Sbarro Pizza, Safety Board investigators found a leaking 2-inch-diameter steel gas service line that apparently had been damaged during excavation for the installation of a 2-inch-diameter polyvinyl chloride plastic conduit of unknown purpose and ownership. The steel pipe was severely corroded in the areas of damage.

The Safety Board team also found a leaking 1 1/4-inch-diameter polyethylene gas line in Calle Camelia Soto. The line was leaking at an opening at a plastic coupling that was located above a 16-inch-diameter high-pressure water line. The water line had been installed several years after installation of the gas line. The soil beneath the segment of leaking gas line had been excavated in the area above the water main, which reduced support for the plastic gas line. Segments of the gas line were found deflected downward.

About 15 feet west of the leaking plastic coupling, the Safety Board found that polyvinyl chloride plastic telephone conduits had been installed directly over and in contact with a gas line segment that ran parallel to Calle Camelia Soto. The telephone conduits and portions of the gas line were encased in concrete and then covered with about 10 inches of additional concrete. While no leaks were found in the gas line segment that lay within and beneath the telephone conduits, this construction method is not an accepted industry practice. Furthermore, it made it impossible for SJGC to have reasonable access to this gas line.

While on scene, Safety Board staff discussed with representatives of the telephone, electric, sewer, water, and gas operations their practices for notifying other facilities operators before beginning excavations. Their responses made it clear that these operators perform most of their excavations without notifying other operators of buried facilities of their plans so that the locations of underground facilities can be marked. Moreover, the excavation-caused damages to the gas lines in Calle Arzuaga and Calle Camelia Soto indicate that excavators most often do not report damage to facility owners; thus the owners are not aware of the need to make repairs.

In 1980, the Safety Board identified the need to implement an excavation damage prevention program in Puerto Rico to minimize damage to pipelines and other buried facilities. In its report on the pipeline accident at Bayamon, Puerto Rico, on January 30, 1980,¹ the Safety Board recommended that the then-Governor of Puerto Rico:

¹National Transportation Safety Board Pipeline Accident Report--*The Pipelines of Puerto Rico, Inc., Petroleum Products Rupture and Fire, Bayamon, Puerto Rico, January 30, 1980* (NTSB/PAR-80/06).

P-80-87:

Direct the appropriate utilities and agencies of Puerto Rico to establish an island-wide "one-call" excavation notification system.

Also, Safety Recommendations P-80-79, -83, and -88 called on The Pipelines of Puerto Rico, Inc., the Public Service Commission, and the Puerto Rico Telephone Company to cooperate with operators of buried facilities in the establishment of an island-wide "one-call"² excavation notification system. Although attempts to initiate the recommended one-call notification system were undertaken, the recommended action was not accomplished because of insufficient cooperation among the various operators of buried facilities and because the Puerto Rico Public Service Commission lacked authority and recourse to sponsor such a system. Safety Recommendations P-80-79 and -87 were classified "Closed—Unacceptable Action," and Safety Recommendations P-83 and -88 were classified "Closed—No Longer Applicable." The pipeline company discontinued operations, and the telephone company, although willing to participate in a one-call notification system, stated that it was not able to undertake the management responsibility for such an operation.

The Safety Board reviewed correspondence between the Office of Pipeline Safety (OPS) of the U.S. Department of Transportation (DOT) and the Puerto Rico Public Service Commission concerning the need for an excavation damage prevention program for Puerto Rico. The Safety Board found that since 1990, the OPS has been encouraging the commission to work with SJGC and other buried-facility operators to establish an excavation damage prevention program, including a one-call notification system. It was also learned that the commission has drafted, but has not obtained approval for, legislation to require that notice be given to buried-facility operations in advance of planned excavations. Further, it was learned that the OPS has periodically provided to the commission information on the excavation damage prevention efforts of several States and has encouraged similar action by Puerto Rico. The OPS also has provided opportunities for commission personnel to review several State excavation damage prevention programs and has provided grant money to assist the commission in establishing an excavation damage prevention program for Puerto Rico.

The Safety Board and the DOT have identified excavation-caused damages as the major cause of pipeline accidents and have encouraged the implementation of programs to minimize those damages. In 1994, the Safety Board and the DOT jointly sponsored a workshop to define essential elements such programs should have. The proceedings³ of that workshop were provided to your office by Safety Board investigators during the on-scene phase of our investigation. Those proceedings stated that for excavation damage prevention programs to be effective, they must:

²In most states, individuals or organizations are required to notify a "one-call" notice center before beginning any excavations. The center disseminates information about the planned excavations to buried-facility operators, who then have an opportunity to mark the location of any underground facilities in the excavation area.

³National Transportation Safety Board, *Proceeding of the September 8-9, 1994, Excavation Damage Prevention Workshop* (NTSB/RP-95/01).

- (1) Have full participation from all organizations that excavate or that operate buried facilities;
- (2) Have one-call notification centers that accept emergency notification 24 hours a day;
- (3) Have effective State damage-prevention requirements that include compliance monitoring and enforcement; and
- (4) Have comprehensive education programs for buried facility operators, excavators, and the public that explain how to use the damage prevention program and the penalties for improper or nonuse.

The excavation damage prevention program implemented can be fully effective only if the buried-facility operators maintain up-to-date maps and facility records. There were several instances during the on-scene investigation in which maps and records of buried facilities were nonexistent, out of date, or incomplete. The Puerto Rico Aqueduct and Sewer Authority maps did not show the 16-inch-diameter high-pressure water main located in Calle Camelia Soto. The Telefonica de Puerto Rico was unable to produce as-built drawings of the telephone conduits installed in the west side of Calle Camelia Soto. The SJGC was unable to quickly locate its drawings of the plastic gas line in Calle Camelia Soto, and some of the records it was able to locate were incomplete in that they were not fully descriptive of the actual gas service lines. Investigators were never able to determine the purpose or ownership of the 2-inch-diameter plastic conduit found in contact with a gas line in Calle Arzuaga.

Therefore, the National Transportation Safety Board recommends that the Governor of Puerto Rico:

Require the dissemination of information to educate citizens about the potential danger to their safety when the odor of gas is detected and the actions they should immediately take for their own safety and for the safety of others. (Urgent) (P-96-26)

Immediately require that no excavation (except during emergency conditions) be made in areas where buried facilities are likely to exist unless the operators of those facilities have clearly identified and marked the facility locations. (Urgent) (P-96-27)

Immediately instruct buried-facility operators to review their maps and facility records to identify errors and omissions, to update their system maps, and to keep their maps up to date. (Urgent) (P-96-28)

Immediately require excavators to promptly notify facility operators of any damage to a buried facility or its support caused by excavation operations. (Urgent) (P-96-29)

Expedite the implementation of an excavation damage prevention program that (1) requires full participation from all organizations that excavate or that operate

buried facilities, (2) has an island-wide one-call notification center that accepts emergency notifications 24 hours a day, (3) has effective damage-prevention requirements that include government-performed compliance monitoring and enforcement, (4) incorporates comprehensive education programs for buried-facility operators, excavators, and the public that explain how to use the damage prevention program, and (5) establishes penalties for failing to use the program properly. (P-96-30)

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety board is vitally interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendations P-96-26 through -30 in your reply. If you need additional information, you may call (202) 314-6462.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these recommendations.

By: 
Jim Hall
Chairman