



Log P-313B

**National Transportation Safety Board**  
Washington, D.C. 20594  
**Safety Recommendation**

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**Date:** MAR - 6 1996

**In reply refer to:** P-96-4 through -6

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About 6:45 p.m. on June 9, 1994, a 2-inch-diameter steel gas service line that had been exposed during excavation separated at a compression coupling about 5 feet north of the north wall of the John T. Gross Towers (Gross Towers), an eight-story retirement home. Gross Towers, located at 14th and Allen Streets (1339 Allen Street), is one of several subsidized-rent residence buildings operated by the Allentown Housing Authority (housing authority) in Allentown, Pennsylvania. Towers East, a 13-story building that is connected to Gross Towers, is also a rent-subsidy building for senior citizens that is operated by the housing authority.

The separated service line, which was owned by UGI Utilities, Inc., (UGI), released natural gas at 55 psig pressure. The escaping gas flowed underground to Gross Towers, where it passed through openings in the building's foundation and filled the space beneath the mechanical room, which served as a combustion air intake reservoir for boilers. Gas then entered the mechanical room through openings in the floor. The gas then migrated to the building's other floors through an adjacent tower that housed the boiler exhaust stacks, through a trash chute, and through floor openings for electrical and other building services.

At the same time, a backhoe operator, an employee of the Environmental Preservation Associates, Inc., (EPAI) was removing fuel-contaminated soil from the excavation site and detected the odor of gas coming from the building. He heard a woman in a third-floor apartment shout to him about a heavy gas odor. The loader, another EPAI employee, opened a side door to the building that led to the boiler room and encountered a very heavy gas odor that "took my breath away." He told his foreman of his observation, and the foreman told the backhoe operator to shut off the machine.

About 6:58 p.m., the natural gas that had accumulated within the building was ignited, causing an explosion. A second explosion occurred about 5 minutes later. At the time of the explosion, many of the Gross Towers and Towers East residents were out of the building. The accident resulted in 1 fatality, 66 injuries, and more than \$5 million in property damage.<sup>1</sup>

The National Transportation Safety Board determines that the probable cause of the explosion and fire was the failure of the management of the EPAI to ensure through project oversight compliance with its own excavation requirements and those of the Occupational Safety and Health Administration. Contributing to the accident was the failure of the EPAI workmen to notify the UGI that the line had been damaged and was unsupported.

Contributing to the severity of the accident was the absence of an excess flow valve (EFV) or a similar device, which could have rapidly stopped the flow of gas once the service line was ruptured. Also contributing to the severity of the accident was the absence of a gas detector, which could have alerted the fire department and residents promptly when escaping gas entered the building.

Once the line and coupling separated, the EPAI could have limited the consequences. When the EPAI foreman was told about the strong odor of gas within the building, he should have immediately called "911." Contrary to his postaccident statement, telephone records show that he did not attempt to call "911" until after the explosion. Had he immediately reported the emergency to the fire department, it would have known almost 15 minutes before the explosion, giving it enough time to respond, notify the UGI, initiate evacuations and building ventilation, and, using the UGI responders, shut off the flow of gas into the building, which would have either prevented the explosion or reduced its force. The Safety Board concludes that the consequences of this accident could have been significantly reduced had the foreman promptly called "911" and had his helper promptly told the occupants of the building to evacuate.

Although it was after normal business hours, the foreman first called the UGI's Lehigh Division business office (the EPAI had not obtained and provided the foreman with the UGI's 24-hour emergency telephone number). Even after contacting the UGI, he did not say, and the UGI did not question, whether the odor of gas had been detected within the building. Had the UGI known that gas was already in the building, it probably would have told him to evacuate the occupants, which he could have done with the help of his crew and the bystanders. The UGI probably also would have notified the fire department, thus giving it more time to respond.

The Safety Board's report<sup>2</sup> on a July 22, 1993, pipeline accident, which cost 2 lives and injured 12 persons, also involved excavation damage and issues similar to the ones in this accident. The report discussed how important it is for excavators to notify local emergency-response agencies promptly. In that accident, the excavator notified the pipeline operator

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<sup>1</sup>For more information, read Pipeline Accident Report *UGI Utilities, Inc., Natural Gas Distribution Pipeline Explosion and Fire, Allentown, Pennsylvania, June 9, 1994* (NTSB/PAR-96-01).

<sup>2</sup>Brief of Pipeline Accident: *Northern States Power Company Gas Pipeline Accident, July 22, 1993, St. Paul, Minnesota* (DCA-93-MP-011).

promptly after gas was released, but he did not notify the local response agencies until more than 20 minutes later. Had the fire department been notified earlier, it might have been able to save lives and prevent injuries.

The accident might also have been avoided had the UGI's procedures required it to review excavations next to service lines, as its procedures required it to review excavations next to gas mains. Had the UGI identified the threat posed to the service line by the proposed excavation, it would have had ample time to get more information from the EPAI on the precautions it planned and to instruct the EPAI on the precautions it should take and the need to report any damage promptly. The UGI also would have been able to inspect the excavation and to take whatever actions were necessary to protect the line. The Safety Board concludes that by failing to recognize the potential hazards posed by the EPAI project, the UGI lost the opportunity to preserve the integrity of the service line. The Safety Board believes that the UGI should broaden its procedures to require the assessing of any proposed excavation that could cause damage that might significantly endanger public safety.

Because city inspectors often see a construction activity on a daily basis and because contractors excavate next to UGI facilities so often, the Safety Board believes the UGI needs to convince the local governments and contractor groups that public safety is endangered when damage is not promptly reported. The UGI should also encourage contractors and inspectors to report any damage they see or suspect to facility owners immediately.

Because the city's fire inspectors saw on May 23 that the service line was unsupported, they could have prevented the accident. They showed proper concern about the safety of the line, especially after a piece of asphalt pavement fell on it and deformed it. However, not having been instructed to do otherwise, both inspectors relied on the EPAI foremen's assessment that the line was safe. It would have been more prudent of them to ask the pipeline owner for the assessment. The Safety Board concludes that the likely reason the fire inspectors did not tell the operator that its service line was damaged was because the inspectors did not understand the importance of notifying operators so the effects on a facility could be assessed by the operators and necessary action taken. Had the inspectors notified the UGI, it, the Safety Board believes, would have taken the necessary corrective actions, and the accident would not have happened.

Had the EPAI or the fire inspectors told the UGI about the damage, it would have had an opportunity to take corrective action. Additionally, the information probably would have convinced the UGI that it needed to inspect the project and tell the EPAI foreman about the need to take precautions and use the UGI's emergency telephone number if he had an emergency. However, neither the EPAI workcrew nor the fire inspectors were trained in what damage should be reported to a buried-facility owner. It is apparent that the UGI's efforts to increase the public's awareness of the dangers of damaging its system during excavations has not been effective in encouraging people to report damage to the UGI immediately.

The National Transportation Safety Board therefore issues the following safety recommendations to the UGI Utilities, Inc.:

Require that people handling emergency calls determine whether escaping gas is likely to enter a structure, and if so, require that the information be quickly conveyed to "911." (Class II, Priority Action) (P-96-4)

Modify its excavation-damage prevention program to include the review and close monitoring of any proposed excavation near a gas service line, including any line with unanchored compression couplings, that is installed near a building and that, if damaged, might endanger public safety significantly. (Class II, Priority Action) (P-96-5)

Instruct members of local governments and contractor groups in its service area about the threat to public safety posed by a gas line that is unsupported or damaged, and emphasize the importance of reporting such information immediately to the facility owner. (Class II, Priority Action) (P-96-6)

Also, the Safety Board issues Safety Recommendations P-96-2 to the Research and Special Programs Administration; P-96-3 to the States and the District of Columbia; P-96-7 to Environmental Preservation Associates, Inc.; P-96-8, through -10 to the Governor of the Commonwealth of Pennsylvania; P-96-11 and -12 to the city of Allentown; P-96-13 to the International Association of Fire Chiefs; P-96-14 through -16 to the Department of Housing and Urban Development; P-96-17 and -18 to the Allentown Housing Authority; P-96-19 to the Associated General Contractors; and P-96-20 to the National Utility Contractors Association.

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-96-4 through -6 in your reply. If you need additional information, you may call (202) 382-0670.

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

By:

  
Jim Hall  
Chairman