



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

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**Date:** December 15, 2000

**In reply refer to:** P-00-20 and -21

Honorable Kelley S. Coyner  
Administrator  
Research and Special Programs Administration  
400 Seventh Street, S.W.  
Washington, D.C. 20590

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On January 22, 1999, while digging a trench behind a building at 406 Alabama Avenue, a backhoe operator damaged a 3/4-inch steel natural gas service line and 1-inch water service line, both of which were underground. This resulted in two leaks in the natural gas service line, which was operated at 35 psig. One leak occurred where the backhoe bucket had contacted and pulled the natural gas service line. The other was a physical separation of the gas service line at an underground joint near the meter, which was close to the building. Gas migrated into the building at 406 Alabama Avenue, where it ignited about 10:02 a.m. An explosion<sup>1</sup> followed, destroying three buildings: 404, 406, and 408 Alabama Avenue. Other buildings within a two-block area of the explosion were significantly damaged. Three fatalities, five serious injuries,<sup>2</sup> and one minor injury resulted from this accident.

The National Transportation Safety Board determined that the probable cause of the accident was the failure of R&B Construction (R&B) to establish and follow safe procedures for excavation activities, resulting in damage to a 3/4-inch gas service line, and the failure of the Utilities Board of the City of Bridgeport (Utilities Board) to provide appropriate emergency response to the subsequent natural gas leak.

The Utilities Board paged its field personnel shortly after the leak was reported, between 9:18 and 9:22 a.m. Shortly afterward, five Utilities Board employees responded to the excavation site from three locations to locate and repair the leaks. One of the Utilities Board employees told Safety Board investigators that upon his arrival at the accident scene, the R&B backhoe operator showed him where he had wrapped black tape over the leak in the gas service line. In addition, he and other Utilities Board employees noticed that water was running on the

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<sup>1</sup> For additional information, read Pipeline Accident Brief—*Natural Gas Pipeline Rupture, Explosion, and Fire, Bridgeport, Alabama, January 22, 1999* (NTSB/PAB-00/01).

<sup>2</sup> According to the Jackson County Coroner, on March 23, 2000, 14 months and 1 day after the accident, one of the seriously injured persons died as a result of injuries sustained in the explosion. In accordance with 49 Code of Federal Regulations (CFR) 830.2, his injuries continue to be classified as “serious” for reporting purposes. 49 CFR 830.2 defines fatal injury as “any injury which results in death *within 30 days* of the accident.”

ground. They could hear the hissing of leaking gas and smell a strong natural gas odor in the general area.

The Utilities Board employee who was the acting supervisor turned the water off so that field personnel could excavate and locate the leak. The acting supervisor could see a portion of the pulled gas service line above ground and said that he suspected that the gas service line was severed at some point. Though the acting supervisor could hear the gas blowing and see the gas bubbling from the water in the excavated ditch, he did not know the direction in which the gas was blowing. He told investigators that he “was hoping” that the line was pulled off at the main and that the gas was blowing up into the air. He added that he believed the leak was routine and the situation was safe. The Utilities Board employees did not check for gas migrating underground or accumulating in buildings and did not stop the flow of gas. After the acting supervisor turned off the water, a Utilities Board employee started digging to remove water and soil from the trench with a backhoe.

Shortly after the Utilities Board backhoe operator started digging, the building at 406 Alabama Avenue exploded. The Alabama State Fire Marshals Office determined that the likely source of ignition for the accumulated natural gas was a gas-fired heater at 406 Alabama Avenue, which had an active pilot light at the time of the explosion.<sup>3</sup> The Superintendent of the Utilities Board estimated that within 5 to 10 minutes after the explosion he had closed two valves on the 4-inch natural gas main feeding the natural gas to the broken service line.

The Utilities Board’s written emergency procedures in effect at the time of the January 22, 1999, accident instruct service personnel to “...evaluate the extent of the emergency, request assistance as needed, and inform the manager if necessary.” The procedures further direct service personnel to:

Evacuate and secure the area if necessary. Actions should be directed towards protecting people *first* and then property.

...If, in the opinion of the person in charge, the emergency is so severe that immediate shutdown is imperative, he may do so without clearance from the Manager.

However, the procedures do not instruct employees responding to a reported leak to consider the possibility of multiple leaks, check for gas accumulation in nearby buildings, and, if necessary, to take steps to promptly stop the flow of gas.

During its annual inspections of the Utilities Board, the Alabama Public Service Commission did not identify any deficiencies in the Utility Board’s emergency procedures. Since the accident, the emergency procedures have been changed only to update the names, addresses, and phone numbers of contact persons and employees.

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<sup>3</sup> Although the gas line had separated underground, the compacted earth surrounding the line would have provided a path that allowed continued gas flow sufficient to have fueled the pilot light.

The Safety Board made recommendations on July 18, 2000,<sup>4</sup> to RSPA, the Occupational Safety and Health Administration, and five utility trade organizations about raising the awareness of utility workers to call 911 or other local emergency number immediately if damage results in a gas leak. The Safety Board concludes the Bridgeport accident illustrates that pipeline operators may also need improved procedures to inform utility workers about the dangers of multiple leaks and of the underground migration of gas from excavation sites into nearby buildings. The Safety Board understands that RSPA is now revising the audit forms used to evaluate the State utility commissions to include such procedures. To ensure that procedures for responding to gas leaks are appropriately reviewed, the Safety Board recommends that the Research and Special Programs Administration:

Inform natural gas pipeline operators of the circumstances of the January 22, 1999, accident in Bridgeport, Alabama. Further, advise operators to review their emergency plans and procedures for responding to gas pipeline emergencies and modify them as necessary. The review should determine whether the procedures prompt the appropriate actions for gas leaks caused by excavation damage near buildings and whether the procedures adequately address the possibility of multiple leaks and the underground migration of gas into nearby buildings. (P-00-20)

Evaluate, during annual inspections of utilities, the adequacy of operator emergency plans and written procedures for responding to gas pipeline emergencies, paying particular attention to procedures that address the possible migration of gas from excavation sites into nearby buildings. If warranted, require that operators modify the procedures. (P-00-21)

The Safety Board also issued safety recommendations to the Alabama Public Service Commission, Alabama One Call, the Utilities Board of the City of Bridgeport, and R&B Construction. Please refer to Safety Recommendations P-00-20 and -21 in your reply. If you need additional information, you may call (202) 314-6170.

Acting Chairman HALL and Members HAMMERSCHMIDT, GOGLIA, BLACK, and CARMODY concurred in these recommendations.

*Original Signed*

By: Jim Hall  
Acting Chairman

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<sup>4</sup> For additional information, read Pipeline Accident Report—*Natural Gas Pipeline Rupture and Subsequent Explosion in St. Cloud, Minnesota, December 11, 1998* (NTSB/PAR-00/01).