



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: June 7, 2007

In reply refer to: P-07-4

Mr. John S. Bozik
President
Mitchell Supreme Fuel Company
American Tank Service Company
532 Freeman Street
Orange, New Jersey 07050

The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge your organization to take action on the safety recommendation in this letter. The Safety Board is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation addresses the need to establish and implement written procedures for safe excavation near pipelines and to provide initial and recurrent training on these procedures to employees. This recommendation is derived from the Safety Board's investigation of the pipeline break, explosion, and fire in an apartment building at 30 Elm Street in Bergenfield, New Jersey, on December 13, 2005, and is consistent with the evidence we found and the analysis we performed. As a result of this investigation, the Safety Board has issued six safety recommendations, one of which is addressed to the American Tank Service Company (American Tank). Information supporting this recommendation is discussed below. The Safety Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendation.

On December 13, 2005, at 9:26 a.m., an apartment building exploded in Bergenfield, New Jersey, after natural gas migrated into the building from a damaged pipeline. Safety Board investigators found a break in a 1 1/4-inch steel natural gas distribution service line that was operating at 11 1/2 pounds per square inch, gauge. The break occurred at an underground threaded tee connection downstream from where excavators were removing an oil tank that was buried under the asphalt parking lot adjacent to the building. The break occurred, under the parking lot, about 7 feet 4 inches from the building's wall. Three residents of the apartment

building were killed. Four residents and a tank removal worker were injured and transported to hospitals.¹

The National Transportation Safety Board determined that the probable cause of the December 13, 2005, natural gas explosion and fire in Bergenfield, New Jersey, was the failure of the American Tank Service Company to adequately protect the natural gas service line from shifting soil during excavation, which resulted in damage to the service line and the release and migration of natural gas into the apartment building. Contributing to the accident was the failure of the Public Service Electric and Gas Company to conduct effective oversight of the excavation activities adjacent to the gas service line and to be prepared to promptly shut off the flow of natural gas after the service line was damaged. Contributing to the casualties in the accident was the failure of the Bergenfield Fire Department to evacuate the apartment building despite the strong evidence of a natural gas leak and the potential for gas to migrate into the building.

The Safety Board's investigation found that the evidence was consistent with the pipeline separating in overstress after the ground collapsed into the trench and caused the pipeline to move. American Tank did not place shoring in the trench during the excavation and failed to evaluate the stability of the soil using accepted methods.²

American Tank's written procedures for excavation work were limited to obtaining markouts³ for buried utilities, including gas pipelines. According to interviews with American Tank personnel, the company's unwritten procedures for protection of other utilities included the following:

- Visit the job site to survey for hazards and logistical issues.
- Obtain all needed permits.
- Survey the job site to ensure markings are in place.
- Uncover the top of the tank to determine its direction and hand excavation of nearby utilities.
- Evaluate the nature of the soil to determine possibility of collapse.
- Contact the utility company and request shutoff.
- Protect and support the utility; contact the utility company if damaged.
- If damage to the utility is observed, call the emergency telephone numbers for the utility and call 911 or fire and police department emergency telephone numbers.

¹ For additional information, see *Natural Gas Service Line Break and Subsequent Explosion and Fire, Bergenfield, New Jersey, December 13, 2005*, Pipeline Accident Brief NTSB/PAB-07/01 (Washington, DC: NTSB, 2007).

² Trench wall soils can be tested for stability by using a penetrometer, which is a mechanical device that measures the force needed for a probe to enter the soil. Another method is the "thumb test," in which the thumb is pushed into the soil along the wall.

³ A *markout* is a ground marking that is typically color coded and that indicates the location of underground utilities.

Of these unwritten procedures, in the Bergenfield accident, lapses in implementing at least three were critical: evaluate the nature of the soil to determine the possibility of collapse, contact the utility company and request shutoff, and protect and support the utility.

The American Tank foreman and assistant manager said that they thought the excavation was stable and secure. However, the American Tank crew did not evaluate the soil at the walls of the trench for stability even though the unwritten procedures called for such an evaluation. In addition, on December 12, the day before the accident, American Tank employees recognized that this was a potentially hazardous situation when they asked the Public Service Electric and Gas Company (PSE&G) to shut off the gas service. After American Tank had been informed that a shutoff at that time was impossible,⁴ it would have been prudent for the crew to stop the excavation and coordinate with the PSE&G to discuss other options and courses of action, such as postponing the excavation until the gas could be shut off, agreeing on the proper way to protect and support the service line during the excavation, and developing a contingency plan to quickly shut off the gas flow in the event the pipeline was damaged during excavation.

The use of effective written procedures by American Tank to address these issues likely could have prevented the lapses previously noted. Written procedures are more likely to be comprehensive and specific than unwritten procedures, and they are more likely to identify all critical tasks in the proper sequence. Written procedures can also be used as part of comprehensive job records to verify that critical tasks are completed in a safe and thorough manner.

In addition to developing effective written procedures, excavation companies must also provide employees with initial and recurrent training to ensure that they understand and comply with the procedures. One source of reference material for written procedures for safe excavation around utilities is the *Common Ground Alliance Best Practices* manual. The Common Ground Alliance is a group composed of utilities, contractors, government regulators, and experts in the industry.

The Safety Board concludes that the development and implementation of effective written procedures would have provided specific instructions and procedures for the American Tank crew to safely excavate the oil tank and to minimize the potential of damaging the natural gas service line.

Based on its investigation of the December 13, 2005, accident in Bergenfield, New Jersey, the National Transportation Safety Board makes the following safety recommendation to the American Tank Service Company:

Establish and implement written procedures for safe excavation near pipelines, and provide initial and recurrent training on these procedures to employees.
(P-07-4)

⁴ According to the PSE&G, shutting off the gas to the building without making prior arrangements with the PSE&G and the building's owner would have created a health risk to the residents by leaving them without gas for heat, hot water, and cooking.

The Safety Board also issued safety recommendations to the Pipeline and Hazardous Materials Safety Administration, the New Jersey Department of Community Affairs, the Borough of Bergenfield, the Public Service Electric and Gas Company, and the International Association of Fire Chiefs. In your response to the recommendation in this letter, please refer to Safety Recommendation P-07-4. If you need additional information, you may call (202) 314-6177.

Chairman ROSENKER, Vice Chairman SUMWALT, and Members HERSMAN, HIGGINS, and CHEALANDER concurred in this recommendation.

[Original Signed]

By: Mark V. Rosenker
Chairman