



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: July 18, 2000

In reply refer to: P-00-2

Honorable Charles N. Jeffress
Assistant Secretary of Labor for Occupational Safety and Health
Occupational Safety and Health Administration
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

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 adequacy of the safety and emergency procedures used by Cable Constructors, Inc., (CCI) crews when working in the vicinity of underground facilities. The recommendation is derived from the Safety Board's investigation of the December 11, 1998, accident in St. Cloud, Minnesota,¹ and is consistent with the evidence we found and the analysis we performed. As a result of this investigation, the Safety Board has issued 13 safety recommendations, 1 of which is addressed to the Occupational Safety and Health Administration. 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.

About 10:50 a.m. on December 11, 1998, while attempting to install a utility pole support anchor in a city sidewalk in St. Cloud, Minnesota, a CCI communications network installation crew struck and ruptured an underground, 1-inch-diameter, high-pressure plastic gas service pipeline, thereby precipitating a natural gas leak. About 40 minutes later, while utility workers and emergency response personnel were taking preliminary precautions and assessing the situation, an explosion occurred. As a result of the explosion, 4 persons were fatally injured; 1 person was seriously injured; and 10 persons, including 2 firefighters and 1 police officer, received minor injuries. Six buildings were destroyed. Damage assessments estimated property losses at \$399,000.

¹ National Transportation Safety Board. 2000. *Natural Gas Pipeline Rupture and Subsequent Explosion in St. Cloud, Minnesota, December 11, 1998*. Pipeline Accident Report NTSB/PAR-00/01. Washington, D.C.

The National Transportation Safety Board determined that the probable cause of this accident was the lack of adequate procedures by CCI to prevent damage to nearby utilities when its anchor installation crews encountered unusual conditions such as striking an underground obstacle. Contributing to the severity of the accident was the delay by CCI in notifying the proper authorities.

Within 1 minute of striking the gas line, the CCI crew foreman, following the procedures his company had established for such an emergency, informed his supervisor of the incident. But the supervisor did not immediately notify emergency response agencies. About 15 minutes elapsed before another individual, not associated with the construction project, notified emergency responders. The CCI supervisor did eventually call Northern States Power Company (NSP), the owner of the gas line, but not until about 30 minutes after the line was struck. By this time, two NSP employees (a gas technician specialist and a utility locator technician) were already on the scene, the company having been notified by the fire department dispatcher.

Had either the crew foreman or his supervisor immediately called 911, responders could have been on the scene within minutes. For example, a fire department vehicle and four firefighters were on the scene within about 2 minutes of being notified, but because of the delayed notification, they arrived some 18 minutes after the rupture and about 21 minutes before the explosion.

The NSP gas technician specialist and the locator technician arrived on the scene about 11:16 a.m., which was about 26 minutes after the pipeline was ruptured. Witnesses stated that the NSP gas technician specialist entered Book-Em's Bar, the building nearest the leak, at street level (the building did not have a basement). Inside the bar, he took readings on a combustible gas indicator and was overheard stating he obtained a reading of 7 percent.² Bar patrons said the gas technician specialist then left the building to look for an entrance to the basement of the adjacent building, which housed Bellanti's Pizza and Deli.

While the gas technician specialist was taking his readings, according to witness statements, the NSP locator technician was determining if the service line had been properly marked. He was also seen assisting with the movement of a vehicle from the secured area. According to radio and cell phone records, about 11:29 a.m., an explosion occurred that killed both the gas technician specialist and the locator technician, as well as one person in the Bellanti's building and a nearby pedestrian. At the time of the explosion, a three-person NSP construction crew, which had been dispatched to shut down the damaged portion of the line, was 2 blocks away from the accident site.

According to the report of the Minnesota State fire marshal, the explosion occurred in the basement of the building where Bellanti's Pizza was located. The basement walls were made of stacked stones and crumbling mortar. According to the fire marshal's report, gas collected in the

² Although the gas technician specialist was killed in the explosion and the gas monitor was not recovered, the 7 percent probably referred to 7 percent of the lower explosive limit (LEL) rather than to a 7 percent concentration of gas in the air. LEL refers to the lowest concentration of a flammable gas that can be ignited. NSP standards state that the LEL of its natural gas is about 4.8 percent. Gas monitors typically indicate the percentage of LEL, meaning that an NSP gas monitor reading of 100 percent would indicate a natural gas concentration of about 4.8 percent.

basement of the building and was ignited by an unknown source. In the basement of the building were several potential sources of ignition, including gas water heaters.

With an earlier start to evaluating the risk of the situation, the gas technician specialist may have been able to determine that gas was, in fact, accumulating in the basement of the Bellanti's building. The gas company and emergency responders may then have decided to evacuate everyone from nearby buildings and out of the area. Additional steps may have been taken to eliminate ignition sources and ventilate the basement. In such an event, the explosion may have been prevented or, at a minimum, some of the people at risk could have been removed from the area.

The Safety Board concluded that had the crew foreman or his supervisor called 911 or the utility owner immediately after the rupture, emergency responders and NSP personnel may have had time to fully assess the risk and to take actions that could have helped either to prevent the explosion or to avoid the resulting loss of life.

Effective August 1, 1999, the State of Minnesota revised Minnesota Statute 216D to require any excavator who breaches a pipeline containing hazardous gas or liquid to immediately notify 911. The law states, in part:

If any damage occurs to an underground facility or its protective covering, the excavator shall notify the operator promptly. When the operator receives a damage notice, the operator shall promptly dispatch personnel to the damage area to investigate. If the damage results in the escape of any flammable, toxic, or corrosive gas or liquid or endangers life, health, or property, the excavator responsible shall immediately notify the operator and the 911 public safety answering point...and take immediate action to protect the public and property.

The director of the Minnesota Division of Emergency Management told Safety Board investigators that State 911 emergency call centers had recorded no noticeable increase in calls to 911 since enactment of the law and that, in the opinion of the official, the law has ensured more timely notification of authorities after excavation damage.

In 1997, the Safety Board published a safety study that discussed industry and government actions to prevent excavation damage.³ The study formalized recommendations aimed at further advancing improvements in excavation damage prevention programs. One area given prominence was emergency procedures applicable when a utility is damaged during excavation. The safety study noted that while Federal regulations require pipeline operators to establish written emergency procedures, the regulations do not apply to excavators, even though "these are the very people that often have responsibility for first response at an excavation disaster." The study concluded that, at a minimum, "excavators should formulate an emergency response plan appropriate for the specific construction site and ensure that employees working at that site know the correct action to take if a buried facility is damaged."

³ National Transportation Safety Board. 1997. *Protecting Public Safety Through Excavation Damage Prevention*. Safety Study NTSB/SS-97/01. Washington, D.C.

The safety study referenced Safety Recommendation P-95-25, issued to the American Public Works Association (APWA) as a result of the Safety Board's investigation of a 1993 accident in St. Paul, Minnesota:

P-95-25

Urge your members to call 911 immediately, in addition to calling the gas company, if a natural gas line has been severed.

Safety Recommendation P-95-25 has been classified "Closed—Acceptable Action" based on the fact that the APWA revised its *Public Works Practices Manual* to include a chapter on utility coordination that addresses this recommendation.

Common Ground: The Study of One-Call Systems and Damage Prevention,⁴ published in August 1999, provides guidance for saving valuable time in emergency notification should a natural gas line be damaged during excavation. The "best practice" statement for notification of emergency personnel is as follows:

If the protective coating of an electrical line is penetrated or gases or liquids are escaping from a broken line which endangers life, health or property, the excavator immediately contacts local emergency personnel or calls '911' to report the damage location.

The National Utility Locating Contractors Association (NULCA) has developed guidelines for excavation practices and procedures for damage prevention. The NULCA guidelines, which were revised in September 1997, include a suggested procedure whereby excavators call 911 if excavation damage "involves a potential risk to life, health or significant property damage."

Both the *Common Ground* best practice and the NULCA guidelines suggest that a call to 911 be made only after an excavator determines that excavation damage has occurred that presents a hazard. Minnesota State law, on the other hand, requires that contractors notify 911 in the event of damage to buried utilities if the damage results in the escape of any flammable, toxic, or corrosive gas or liquid *or* endangers life, health, or property. The wording of the Minnesota law relieves excavators of the responsibility of determining whether damage represents a hazard before they call 911 and the utility owner. The Safety Board prefers this approach over that of the *Common Ground* best practice or the NULCA guidelines.

In the view of the Safety Board, the utility owner and 911 or other appropriate emergency notification number should be called any time a hazardous substance is released from a pipeline through construction damage, regardless of whether those on the scene perceive an immediate danger to public safety. Excavators are not all knowledgeable about what constitutes a hazardous

⁴ The *Common Ground* report was prepared by more than 160 individuals representing a wide range of interests, organizations, and viewpoints on preventing damage to underground facilities. The project was initiated by the U.S. Department of Transportation's Office of Pipeline Safety, an element of the Research and Special Programs Administration, in response to the Transportation Equity Act for the 21st Century, Public Law 105-78, signed into law June 9, 1998. The purpose of the year-long study was to identify and validate existing best practices performed in connection with preventing damage to underground facilities.

situation. For example, they may not be familiar with the hazards of gas migrating underground, or they may not realize that a pulled pipeline could be broken in more than one place. Emergency responders can usually arrive at the scene quickly and are often trained and equipped to assess such hazards and take appropriate safety measures.

Strengthened requirements to notify utility owners immediately in the event of any damage to a pipeline can also increase safety. The sooner the experts from the operator are notified, the sooner they can apply their knowledge to reduce the public safety risks. Whereas some contractors may previously have waited until the end of the day to report damage to pipelines that did not appear to present an obvious threat, requiring immediate notification of operators could possibly help them prevent a minor problem from developing into a major hazard. Some damage may not result in an immediate leak but may represent a hazard in the future. The pipeline operator can determine if corrective measures are needed to prevent a future failure. If an immediate pipeline leak does occur, the utility owner is in the best position to be aware of the hazards associated with the product in its pipelines and the appropriate safety countermeasures, and to be able to shorten the time until a leak can be stopped.

Additionally, in the Safety Board's view, strengthening the notification requirement will increase awareness on the part of contractors and other excavators of the importance of taking care not to damage utilities, and a reduction in the number of such incidents may be expected.

The National Transportation Safety Board therefore issues the following safety recommendation to the Occupational Safety and Health Administration:

Require excavators to notify the pipeline operator immediately if their work damages a pipeline and to call 911 or other local emergency response number immediately if the damage results in a release of natural gas or other hazardous substance or potentially endangers life, health, or property. (P-00-2)

The Safety Board also issued safety recommendations to the Research and Special Programs Administration, the Associated General Contractors of America, the National Utility Contractors Association, the Power and Communications Contractors Association, the National Cable Television Association, the American Public Works Association, and the International Association of Fire Chiefs.

In your response to the recommendation in this letter, please refer to P-00-2. If you need additional information, you may call (202) 314-6170.

Chairman HALL and Members HAMMERSCHMIDT, GOGLIA, BLACK, and CARMODY concurred in this recommendation.

By: Jim Hall
Chairman