

P-110

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: December 29, 1978

Forwarded to:

Mr. Charlie Rambo
President
Gas Service Company
2460 Pershing Road
Kansas City, Missouri 64108

SAFETY RECOMMENDATION(S)

P-78-68 through -75

At 1:30 p.m., c.d.t., on June 12, 1978, a 10-inch natural gas pipeline owned by the Gas Service Company (gas company) was struck and ruptured by excavation equipment during construction of a sewer in Kansas City, Missouri. The natural gas, at more than 110-psig pressure, escaped from a 5-inch-long hole in the pipeline. At 3:15 p.m., the gas ignited while two gas company employees were cleaning the pipe with hand tools before installing a pipe repair clamp. Both men were burned seriously. 1/

One week before the accident, a gas company inspector had accurately located the pipeline with an electronic pipe locator. He placed two yellow location flags over it, 75 feet apart, one on each side of the sewer easement. On the day of the accident, the contractor planned to grade the sewer easement in the area where the plans showed the sewer crossing the pipeline. About 7 a.m., the contractor's superintendent instructed an equipment operator to dig a 5-foot-deep and 15-foot-wide "bench" along the centerline of the sewer with a large diesel Caterpillar tractor, Model 977 Highloader, from which a medium-size backhoe could excavate down to the planned 20-foot depth of the sewer. The equipment operator was shown the location flag on the east side of the sewer right-of-way but not the other location flag or the permanent pipeline markers, which were partly obscured by weeds on the pipeline right-of-way.

1/ For more detailed information read "Pipeline Accident Report--The Gas Service Company Natural Gas Pipeline Rupture and Fire, Kansas City, Missouri, June 12, 1978" (NTSB-PAR-78-5).

At 11:30 a.m., the superintendent called the gas company and asked how deep the pipeline was buried at the crossing. The gas company engineer taking the call said that although the company's newer pipelines are buried about 30 inches deep, he did not know the exact depth of the 48-year-old pipeline. He suggested that the superintendent talk to the gas company dispatcher and request that an inspector be sent to the job site to determine the exact depth. The superintendent did not call the dispatcher as recommended because a large backhoe, the primary piece of excavating equipment, was being used more than 100 feet from the crossing, and would not arrive at the crossing that day. About 2 hours later, the highloader struck and ruptured the pipeline at a depth of 24 inches.

The sewer was being installed for the city of Lee's Summit, Missouri. The city had not invited the gas company to the preconstruction meeting with the contractor and consulting engineer where questions regarding the location and depth of the pipelines to be crossed could have been discussed. The gas company had not designated a project coordinator to provide liaison between the contractor and the gas company's engineering and field divisions. A project coordinator could have kept track of the contractor's progress, and also could have had the weeds removed from the pipeline right-of-way and from around the permanent line marker signs.

The pipeline had been installed before there were Federal regulations specifying minimum depths of pipelines. The current regulations call for a minimum cover of 36 inches over a pipeline in a Class 3 location. When the pipeline was exposed for maintenance on March 15, 1978, and a Pipe Condition Report Form made out, the workers failed to note in the space provided that the depth of the pipeline was only 24 inches. Engineering office personnel could have reviewed the form and recorded on the pipeline map any depths that were less than the current minimum covers. If a record had been made, it could also have been consulted when the contractor called and requested the depth of the pipeline 2 hours before the accident.

The gas company had designated emergency valves along the pipeline and included this information in its emergency plan. However, the pipeline rupture initially did not seem large enough to warrant closing the emergency valves and interrupting gas service to several hundred customers along the 2 1/2 miles of pipeline that would be shut down if the valves were closed. The gas company's emergency plan did not specify, however, what a "safe" repair pressure should be in the event the emergency valves were not closed and the pressure was controlled to maintain customer service.

There was no fire extinguishing equipment at the accident site that was capable of putting out the fire. The gas company's 150-pound extinguisher and three streams of water from the firemen's hoses were not effective in extinguishing the fire at the 80-psig gas pressure. Rather than installing pipeline stopples or leaving the gas-fueled flames to continue to burn under controlled conditions, the gas company allowed the firemen to extinguish the fire by bulldozing dirt over the rupture when the pressure was reduced to 10 psig. Because the fire was extinguished, the escaping gas could have reignited until the pipeline was finally repaired 16 hours after the fire was extinguished.

Both of the men injured by the fire wore safety goggles and hard hats. One of the men was wearing a short-sleeve uniform shirt and trousers made of polyester material. The other worker was wearing cotton pants and a long-sleeve cotton shirt. Both men received second- and third-degree burns over 60 percent of their bodies. However, the man with the polyester uniform was burned more severely. The use of flame-retardant clothing by these men would have reduced the severity of their injuries.

Therefore, the National Transportation Safety Board recommends that the Gas Service Company:

Improve liaison with the municipalities and consulting engineers within its operating area and request that the gas company be notified of all preconstruction meetings to determine if gas facilities will be affected by the construction activities. (Class II, Priority Action)(P-78-68)

Improve communications and cooperation between its engineering and field personnel to insure that responsible gas company employees are aware of a contractor's questions regarding gas facilities as the contractor's work progresses. (Class II, Priority Action)(P-78-69)

Require its personnel to record all information requested on the Pipe Condition Report Form. Any pipeline depths of less than the minimum required in 49 CFR 192.327 should be carefully noted on pipeline maps and other records. (Class II, Priority Action)(P-78-70)

Revise its emergency plan to show what segments of a pipeline can be taken out of service for repairs, and establish the maximum safe operating pressures for repairs to such pipelines. (Class II, Priority Action)(P-78-71)

Revise its emergency plan to include all of the liaison and coordination requirements of 49 CFR 192.615, and provide training material to local fire departments about the hazards of extinguishing gas fires. (Class II, Priority Action)(P-78-72)

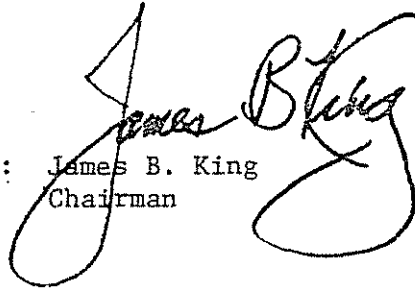
Include in company maintenance procedures the requirement that vegetation on pipeline rights-of-way and around line marker signs be cleared before construction equipment is used near gas pipelines. (Class II, Priority Action)(P-78-73)

Require the use of flame-retardant material in the uniforms of personnel required to work in gaseous atmospheres. (Class II, Priority Action)(P-78-74)

Train its distribution repair crews to work safely on high-pressure transmission pipelines. (Class II, Priority Action)(P-78-75)

KING, Chairman, DRIVER, Vice Chairman, McADAMS and HOGUE, Members, concurred in the above recommendations.

By: James B. King
Chairman

A large, stylized handwritten signature in black ink, appearing to read "James B. King". The signature is written over the typed name and title.