

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: December 29, 1978

-----  
Forwarded to:  
  
Honorable Joseph Teasdale  
Governor  
State of Missouri  
Jefferson City, Missouri 65102  
  
-----

SAFETY RECOMMENDATION(S)  
P-78-80 and -81

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 1977 specifications for the project did not mention that the contractor should comply with a Missouri law known as the Underground Facility Safety and Damage Prevention Act (Senate Bill No. 583) that became effective in 1976.

This act requires that before making an excavation in any public street or easement, a contractor should give notice to and obtain information from the utility being crossed. The utility should "inform such excavator as promptly as practical, but not in excess of two normal working days from receipt of the notice; unless otherwise mutually agreed, by some reasonable and customary means of the correct location of underground facilities in or near the area of excavation so as to enable the person engaged in the excavation work to locate the facilities in advance of and during the excavation work."

In this accident, the gas company had accurately marked the pipeline's horizontal location 1 week before the accident. However, the request for the vertical location of the pipeline was not made until 2 hours before the accident. The electronic pipe locator used earlier by the gas company inspector was accurate because the pipeline was so shallow and there were no other utilities nearby to "confuse" the signal.

Some State excavation damage laws, such as Michigan's, require a minimum 3-foot-wide strip of protection around the utility to provide for possible location errors. The Missouri law does not provide such a buffer zone for instrument or operator error. The Missouri law should be changed to include hand-dug test holes, or other proven, accurate methods, to establish the precise location of underground utilities. All other location methods should be considered to have determined only approximate locations that require a buffer zone. A wider buffer zone for underground utilities crossing at less than a right angle should also be considered in the proposed law amendments.

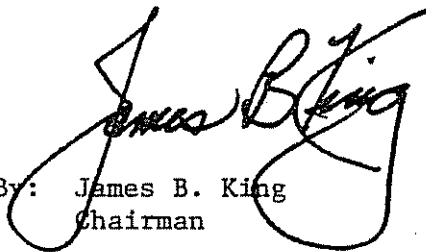
Therefore, the National Transportation Safety Board recommends that the State of Missouri:

Amend State law to specify the use of hand-excavated test holes, or other proven, accurate method, to establish a precise depth or location of the underground facility, and to establish a wide buffer zone beside a pipeline location, over which heavy equipment cannot operate, to allow for errors in establishing the approximate location of underground facilities. (Class III, Longer Term Action)(P-78-80)

Require municipalities to incorporate the amended State "Underground Facility Safety and Damage Prevention Act" in the specifications of construction projects which use large excavating equipment and during which gas pipeline facilities will be crossed, and require that the contractor have the specifications with the State law requirements at the job site for ready reference by the workers. (Class III, Longer Term Action)(P-78-81)

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.