

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: July 19, 1978

Forwarded to:

Mr. G. H. Lawrence
President
American Gas Association
1515 Wilson Boulevard
Arlington, Virginia 22209

SAFETY RECOMMENDATION(S)

P-78-34 through -37

At 12:50 a.m., c.s.t., on December 15, 1977, a 2-inch plastic gas main under an alley in downtown Lawrence, Kansas, pulled out of a compression coupling which joined it to a steel gas main. Natural gas escaped from the main and migrated through the stone foundation walls of two nearby buildings. At 1:20 a.m., the accumulations of gas in the two buildings ignited. The resulting explosion and fire destroyed one building, severely damaged the other building, and broke nearby windows. Two persons were killed and three persons were injured. 1/

The 394-foot-long polyethylene plastic gas main had been inserted in an abandoned 3-inch steel main on June 2, 1975, without being designed or anchored against pullout. The Safety Board's test on this joint indicated that there was an approximate one-third reduction in the pullout resistance of the joint after it had been installed for 2 1/2 years. Marks on the end of the plastic pipe indicated that it had moved within the standard compression coupling by thermal contraction over three winters.

This accident was almost a "carbon copy" of the failure that occurred in Fremont, Nebraska, on January 10, 1976. 2/ That failure indicated that another brand of standard compression coupling with a similar smooth metal stiffener used inside the plastic pipe also weakened with time and pipe movement also had taken place over two winters.

1/ For more detailed information read "Pipeline Accident Report -- Kansas Public Service Company, Inc., Explosion and Fire, Lawrence, Kansas, December 15, 1977," (NTSB-PAR-78-4).

2/ "Pipeline Accident Report -- Nebraska Natural Gas Company, Pathfinder Hotel Explosion and Fire, Fremont, Nebraska, January 10, 1976," (NTSB-PAR-76-6).

The Safety Board is concerned that there may be more unanchored plastic pipe insertions moving within their standard compression couplings which may ultimately fail if additional testing is not undertaken to determine which joints are safe. The Safety Board considers this a major safety problem that needs attention.

Therefore, the National Transportation Safety Board recommends that the American Gas Association:

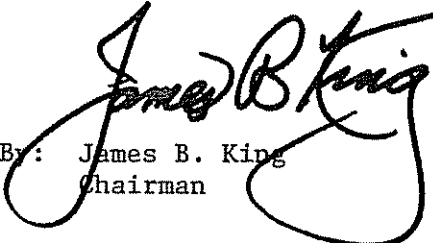
Conduct tests to determine the effect of time on the pullout resistance of standard compression couplings and polyethylene plastic pipe. (Class III, Longer Term Action)(P-78-34)

Conduct tests on the more common types of mechanical joints used on plastic pipe. Publish the results of these tests to member companies along with the recommendations of the manufacturers regarding whether the joint should be used for gastightness only or also for pullout resistance. (Class III, Longer Term Action)(P-78-35)

Conduct tests on the more common internal stiffeners used to reinforce plastic pipe. Determine what style of compression coupling is compatible with each stiffener. (Class III, Longer Term Action)(P-78-36)

Determine the effect of polymer aging, outdoor exposure, and stacking of coiled plastic pipe on its ultimate use. Specify to the natural gas industry what tests should be conducted on the pipe to prove its integrity if excessive storage is found to be detrimental. (Class III, Longer Term Action)(P-78-37)

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


By: James B. King
Chairman