Log P-105

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: July 19, 1978

Forwarded to:

Mr. Austin F. Platt
President
Dresser Manufacturing Division
Dresser Industries, Inc.
41 Fisher Avenue
Bradford, Pennsylvania 16701

SAFETY RECOMMENDATION(S)

P-78-38 through -40

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, and connected to a steel gas main with a Dresser Style 90 short-barrel compression coupling. The 5-inch-long steel stiffener used inside of the end of the plastic pipe was manufactured by Du Pont and was a smooth stiffener as opposed to the serrated type manufactured by Dresser. Tests at the National Bureau of Standards indicated that this combination of component parts was not as strong as the plastic pipe being joined. The tests further 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 Style 90 compression coupling by thermal contraction over three 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).

The Dresser installation instructions for Style 90 couplings dated January 1974 states that "when pipe movement out of the coupling or fitting might occur, proper anchorage of the pipe must be provided." This message sent in boxes of fittings probably was overlooked by the gas company's field personnel. Therefore, the Safety Board would like to see a more strongly worded warning issued with each box of fittings so that field personnel will not overlook its importance, such as:

> WARNING! THIS STANDARD 2-INCH STYLE 90 COUPLING IS NOT RECOMMENDED FOR ANCHORING STEEL OR PLASTIC PIPE. THE USE OF A SPECIAL PLASTIC PIPE LOCK INSERT STYLE 90 OR "700" POSI-HOLD TRANSITION COUPLING IS RECOMMENDED FOR JOINING INSERTED PLASTIC PIPELINES MORE THAN 75 FEET IN LENGTH. CONSULT WITH YOUR ENGINEERING DEPARTMENT OR YOUR DRESSER REPRESENTATIVE IF YOU HAVE ANY QUESTIONS.

The American Gas Association has been asked to publish results of tests to member companies regarding whether the joint should be used for gastightness only or also for pullout resistance.

The Safety Board recognizes the need of the steel stiffener to be compatible with the design of the compression coupling, and would prefer that a single manufacturer produce both components and be responsible for the entire joint. However, there are those in industry and government that will insist on using products from more than one manufacturer. If it is feasible to test various combinations of stiffeners and plastic pipes that a customer may wish to use with your couplings, it would be preferable for a single testing laboratory to test the entire joint under controlled conditions.

Therefore, the National Transportation Safety Board recommends that the Dresser Manufacturing Company:

> Enclose strongly worded warning literature in each box of Style 90 couplings shipped indicating that this standard compression coupling is NOT recommended for connecting long lengths of inserted plastic pipes or the anchoring of plastic pipe. (Class II, Priority Action)(P-78-38)
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> Provide test data to the American Gas Association and make recommendations to them as to what the safe application should be for each fitting that Dresser manufactures to join plastic pipe. (Class III, Longer Term Action)(P-78-39)

Investigate the possibility of setting up a testing laboratory where customers can send in samples of plastic pipe and inserts to be tested with couplings and then be provided certified results of the tests and application recommendations. (Class III, Longer Term Action)(P-78-40)

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

By: James B. King
Chairman