Log P-77 No. 1825 Rec P-76-22 thru 25

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

FOR RELEASE: 6:30 P.M., E.D.T., JUNE 14, 1976

(202) 426-8787

ISSUED: June 14, 1976

Forwarded to:

Mr. Robert E. Thomas
President
Mid-America Pipe Line System
1437 S. Boulder Avenue
Tulsa, Oklahoma 74119

SAFETY RECOMMENDATION(S)

P-76-22 through 25

At 8:30 p.m. on February 25, 1976, a Mid-America Pipe Line System (MAPCO) 8-inch liquefied petroleum gas (LPG) pipeline ruptured near Whitharral, Texas. The escaping LPG vaporized, formed a low-lying cloud, and ignited. Flames roared skyward in excess of 200 feet and engulfed a 3/4-mile-long by 1/4-mile-wide area. The force of the rupture created a crater 20 feet long, 12 feet wide, and 5 feet deep. There were 5,415 barrels of LPG (227,430 gallons) released and burned. The occupants of two dwellings in the area were burned severely, and five were killed. The flames receded toward the ruptured pipeline where they were extinguished at 5:00 a.m.

Investigation showed that the longitudinal seam of the 8-inch pipe had split. The 8 1/2-foot-long split was located on the side of the pipe at the 9-o'clock position. The pipe was manufactured by the Jones and Laughlin Steel Corporation in 1960 and had the following specifications:

8 5/8-inch outside diameter
API 5LX-52 electric resistance weld (ERW)
.219-inch wall thickness
2,650-psig internal pressure at specified minimum yield strength (SMYS)
3,350-psig ultimate bursting strength

When the pipe failed, the pump station was operating at 1,570 psig (about 59 percent of SMYS) -- well below the 72 percent of SMYS specified by Federal regulations. When the line was constructed, this section had been tested hydrostatically to 1,660 psig for 8 hours.

The MAPCO LPG system has sustained a series of longitudinal pipe seam failures. From January 1968 to the date of the Whitharral accident, 14 longitudinal pipe seam failures occurred which resulted in 6 fatalities and the loss of over 60,000 barrels (2,520,000 gallons) of LPG. Of these 14 seam failures, 10 occurred in 8-inch pipe and at pressures ranging from 1,265 psig to 1,570 psig; the average pressure was 1,445 psig.

As a result of an accident which occurred in Nebraska on December 5, 1968, the Nebraska State Fire Marshal ordered MAPCO to reduce its operating pressure and to hydrostatically retest 52 miles of pipeline. During the tests, 195 longitudinal seams failed. The average pressure at which they failed was 2,235 psig. This pipe also was manufactured by the Jones and Laughlin Steel Corporation. Metallurgical analysis revealed that most of the accidents were caused when the electric resistance weld (ERW) in the longitudinal pipe seam failed.

Therefore, the National Transportation Safety Board recommends that the Mid-America Pipe Line System:

> Examine its leak records involving pipe seam failures to determine whether other sections of its system may be inadequate, and retest these areas hydrostatically. (P-76-22) (Class I, Urgent Followup)
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> Retest hydrostatically all of the sections which contain ERW pipe manufactured by the Jones and Laughlin Steel Corporation and which are near schools, hospitals, and populated areas. (P-76-23) (Class I, Urgent Followup)
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> Use internal pipeline inspection equipment in the sections which are not retested hydrostatically to detect any longitudinal pipe seam defects. (P-76-24) (Class II, Priority Followup)
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> Reduce the pressure in those sections where seams have failed until they can be retested or inspected internally. The pressure should not exceed 1,155 psig. (P-76-25) (Class I, Urgent Followup)

TODD, Chairman, McADAMS, HOGUE, BURGESS, and HALEY, Members, concurred in the above recommendations.

By: Webster B. Todd, Jr.
Chairman

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