Log P-76 Act 1825 Rec P-76-20 and 21

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: June 14, 1976

Forwarded to:

Hon. William T. Coleman, Jr.
Secretary
Department of Transportation
Washington, D. C. 20590

SAFETY RECOMMENDATION(S)

P-76-20 and 21

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 Department of Transportation:

> Review all pertinent data such as leak and failure reports submitted by liquid pipeline carriers to determine if longitudinal weld failures constitute a recurrent safety problem, and take appropriate regulatory action if they do. (P-76-20) (Class II, Priority Followup)
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> Request all pipeline companies which have installed ERW pipe manufactured by the Jones and Laughlin Steel Corporation to review their records on longitudinal seam failures and determine if the number of such failures is abnormally high. After DOT reviews these data, it should take necessary corrective action. (P-76-21) (Class I, Urgent Followup)

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

By: Webster B. Todd, Jr.
Chairman