

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

CORRECTED COPY

ISSUED: August 5, 1976

REISSUED: August 20, 1976

Forwarded to:

Mr. Frank N. Ikard
President
American Petroleum Institute
2101 L. Street, N.W.
Washington, D. C.

SAFETY RECOMMENDATION(S)

P-76-42

At 12:28 p.m. on May 12, 1975, an 8-inch pipeline, which was closed in under pressure and which was owned by Dow Chemical U.S.A and operated as the Bronco Pipe Line Company, ruptured near Devers, Texas. Natural gas liquids at 1,425 psig pressure erupted from a fracture near the top of the pipe. The liquids vaporized, mixed with air, and formed a cloud which drifted to the southwest over U. S. Highway 90. An automobile entered the vapor cloud and ignited the ethane-propane vapors. The resulting explosion and fire killed the four persons in the automobile, melted telephone and electric power lines, warped railroad tracks, burned and scorched adjacent woodlands, and interrupted rail and highway traffic.

The National Transportation Safety Board determines that the probable cause of the accident was the rupturing of the 8-inch pipe in an area of stress concentration caused by a gouge in the pipe; the pipe was gouged by a backhoe when valve assemblies were installed in the line. The failure was caused by a combination of reduction in wall thickness, residual bending and tensile stresses, and fatigue due to the cyclic loading of the pipe. The escaping LPG vapors were ignited by an automobile which entered the vapor rich zone.

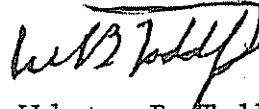
DOW had not inspected the line adequately during construction; consequently, it was not aware that the line had been gouged when valves were installed on the Texas Division's section. DOW also had not provided for rapid shutdown of the system in the event of an emergency, it did not have equipment to transmit pressure data to the dispatchers in accordance with 49 CFR 195, and it did not utilize the total systems concept to design or operate this pipeline.

The Safety Board, on May 25, 1972, made a recommendation to the American Petroleum Institute (API) in its special study, "A Systematic Approach to Pipeline Safety." The recommendation concerned the development of guidelines for the use of system safety by liquid pipeline operators. This is the type of accident that the Safety Board's recommendation was intended to prevent. The utilization of the techniques of system safety would have pointed out the problems which led to this accident.

Therefore, the National Transportation Safety Board recommends that the American Petroleum Institute:

1. Implement the recommendation made in the Safety Board's Special Study on "A Systematic Approach to Pipeline Safety." (P-76-42) (Class II, Priority Followup)

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



By: Webster B. Todd, Jr.
Chairman

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