Log P-285A

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: November 24, 1986

In reply refer to: P-86-17

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About 3:55 p.m., eastern standard time, December 6, 1985, a natural gas explosion and fire destroyed the River Restaurant at 268 Main Street in Derby, Connecticut. Gas escaping from a broken gas main at a pressure of about one pound per square inch had escaped, migrated into the restaurant basement, ignited, exploded, and burned. Of the 18 persons inside the restaurant at the time, 6 were killed and 12 were injured; 1 passerby and 1 firefighter were also injured. After the accident the street adjacent to the restaurant was excavated where a 24-inch diameter sewer system had just been installed; an 87-year-old, 3-inch diameter, cast-iron natural gas main was found broken. 1/

Cast-iron gas main failures often occur suddenly accompanied by the release of relatively large amounts of gas from a circumferential failure. Further, cast-iron gas main breaks most often occur beneath paved surfaces or below frost line (in winter) where escaping gas is unable to vent to the atmosphere and continues to build up below ground until it finds the path of least resistance (sewer pipe, electric conduct, water lines, etc.). The gas then travels along these paths, enters basements, crawl spaces, and foundations and is ignited. These accidents are very common and the Safety Board long has been concerned about the apparent frequency and seriousness of these failures.

Further, cast-iron gas mains are steadily aging and, in many cases, the vehicular traffic (particularly heavy truck traffic) over these gas mains has increased in number as well as in weight. Because of these factors the Safety Board is concerned that the rate of failures of cast-iron gas mains may increase even further. While, to some extent, the same factors affect steel and plastic gas mains, they are more resilient, less brittle, and therefore, less apt to fail as a result of these factors.

Until now the Safety Board has addressed cast-iron gas main accidents on a case-by-case basis with recommendations generally made to the specific pipeline company involved in the accident. However, the Safety Board now believes that cast-iron gas

1/ For more detailed information read Pipeline Accident Report—"Northeast Utilities Service Company, Explosion and Fire, Derby, Connecticut, December 6, 1985" (NTSB/PAR-86/02).

mains, many of which have distributed natural gas to the public for well over 100 years, should be phased out in a planned, orderly, and economically feasible manner. The Safety Board is aware that some large gas distribution companies are already engaged in cast-iron gas main replacement programs. Many of these large gas companies determine which cast-iron main is to be replaced based on the age of the cast-iron main, diameter of the cast-iron main, leak history of the cast-iron main, gas demand through the cast-iron main, depth of the cast-iron main, and vehicular traffic type and amount over the cast-iron main. In addition, many of the large gas distribution companies, on their own initiative, have systematically collected and recorded environmental information about their cast-iron gas main failures which can and should be used in their planned replacement programs.

However, no industry guidelines based on the available data, have been developed to provide direction to all gas distribution companies on how to develop replacement programs. Such guidance is needed to establish cast-iron gas main replacement programs with enough flexibility to accommodate the various needs of and resources available to large, medium, or small gas distribution companies. The Safety Board believes that if the gas distribution industry was required to initiate a program to replace its cast-iron gas mains through a well-planned, and well-executed program, this would result in a decrease in cast-iron gas main failures and a concurrent decrease in catastrophic accidents.

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

> Develop, in conjunction with the American Society of Mechanical Engineers, Gas Piping Standards Committee, specific guidelines for the replacement of cast-iron gas mains in large, medium, and small gas distribution companies. The guidelines should include, but not be limited to such factors as pipe age, pipe diameter, soil corrosivity, buried depth, and external loading. (Class II, Priority Action) (P-86-17)

Also, as a result of its investigation, the Safety Board issued Safety Recommendations P-86-16 to the National Utilities Contractors' Association, P-86-18 to the city of Derby, Connecticut and P-86-19 and -20 to the Northeast Utilities Service Company.

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility ". . . to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendation P-86-17 in your reply.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER and NALL, Members concurred in this recommendation.

By: Jim Burnett
Chairman