

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: September 15, 1976

Forwarded to:

Mr. Oliver Peden
President
Nebraska Natural Gas Company
340 East Military
Fremont, Nebraska 68026

SAFETY RECOMMENDATION(S)

P-76-48 through P-76-55

At 9:32 a.m. on January 10, 1976, gas which was leaking into the Pathfinder Hotel, in Fremont, Nebraska, ignited. The gas was leaking from a 2-inch plastic pipe which had pulled out of its compression coupling; the gas seeped into the hotel because it had been capped above by frozen earth and a concrete road surface. The hotel exploded and fire ensued; the explosion and fire destroyed the hotel, damaged nearby buildings, and broke windows within a one-block radius. Thirty-nine persons were injured and 20 persons were killed. 1/

A 348-foot-long 2-inch plastic main was inserted in an existing 4-inch steel main on June 26, 1974, when the air temperature was 86°F and the minimum ground temperature was interpolated from engineering handbooks to be 60°F. At the time of the accident, the ground temperature was 36°F. This 24°F temperature change caused the pipe to contract. If the pipe had been unrestrained, it could have contracted up to 9½ inches the first year. However, the seven service lines attached to it and the restraints of the compression coupling allowed the plastic pipe to move only 1¼ inch within one of the couplings during the first winter after installation. During the second winter, the plastic pipe pulled completely out of this coupling which was in front of the hotel, and caused the accident.

The plastic pipe manufacturer recommends that proprietary transition fittings or pipe-to-casing anchors be used to limit the con-

1/ For more detailed information on this accident, read "Pipeline Accident Report -- Nebraska Natural Gas Company, Pathfinder Hotel Explosion and Fire, Fremont, Nebraska, January 10, 1976." NTSB-PAR-76-6.

traction of plastic pipe inserts which are over 100 feet long. The Nebraska Natural Gas Company did not have any detailed procedures for constructing plastic pipe-compression coupling joints.

Persons detected gas over 4 hours before gas company personnel arrived at the hotel. Because two of the three servicemen who were on call for the weekend were away from their telephones, there was an exceptionally long delay of 1 hour before the gas company responded to the emergency call from the hotel. On-call servicemen had not been trained to classify leaks as to the degree of hazard or trained with regard to emergency procedures. Delays in locating the leak were also created because the vehicles of the on-call emergency servicemen were not equipped with combustible gas indicators, block cards to show gas facilities, or distribution system maps.

Since there were not enough high-pressure distribution valves and since their locations were unknown, there was a 5-hour delay in shutting down gas service to the accident area after the hotel exploded, and half of Fremont had to be shut down to isolate the hotel area.

Therefore, the National Transportation Safety Board recommends that the Nebraska Natural Gas Company:

Use manufacturer's proprietary transition fittings, installed in accordance with written procedures, or use pipe-to-casing anchors to limit contraction of plastic pipe, until a compression coupling is verified by tests to be as strong as the plastic pipe being joined. (P-76-48) (Class II, Priority Followup)

Develop written procedures and an inspection program to insure that all plastic pipe joints meet the design and installation provisions of 49 CFR 192(F), "Joining of materials by means other than welding." (P-76-49) (Class II, Priority Followup)

Revise the company's written procedures to include the maximum length of plastic pipe to be used with compression couplings, the number of foot-pounds of torque required for each size of compression coupling, a time interval during construction between retorquing of couplings, and the type of stiffener to be used with each brand of coupling. (P-76-50) (Class II, Priority Followup)

Develop written procedures to handle gas leak emergencies and evacuation, and instruct operating and maintenance employees as to their roles in carrying out these procedures. (P-76-51) (Class II, Priority Followup)

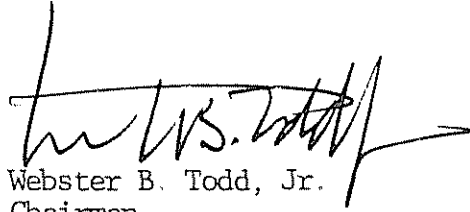
Develop a procedure to shut down the system during emergencies. As part of this procedure, develop distribution system maps showing valve locations, determine optimum spacing of high-pressure valves in each of the NNG distribution systems, and install additional valves, if necessary, to reduce the time required to shut down a section of main in an emergency. (P-76-52) (Class II, Priority Followup)

Develop a method of receiving emergency telephone calls in order to assure immediate response to emergencies. The method should include logging of all emergency calls. (P-76-53) (Class II, Priority Followup)

Improve the customer education program and liaison between the gas company, the police, and the fire departments. Include in written procedures the methods for notifying police and fire departments of gas emergencies and the planned responses to them. (P-76-54) (Class II, Priority Followup)

Equip emergency vehicles with combustible gas leak detectors, distribution maps, and other necessary work tools. (P-76-55) (Class II, Priority Followup)

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


By: Webster B. Todd, Jr.
Chairman