

Log P-76 Not 2107 Rec P-77-9 thru 12

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

ISSUED: June 24, 1977

Forwarded to:

Mr. Louis R. Reif
President
National Fuel Gas Company
10 Lafayette Square
Buffalo, New York 14203

SAFETY RECOMMENDATION(S)

P-77-9 through P-77-12

At 2:42 a.m. e.s.t. on March 26, 1977, the Buffalo Police Department reported gas odors in a telephone company manhole near 1446 South Park Avenue. A National Fuel Gas Company serviceman arrived at the scene at 3:14 a.m. and checked the vault below the manhole for gas. His combustible gas indicator (CGI) indicated a full-scale reading on its single, lower-explosive limit scale, and he radioed for additional help.

At 4:30 a.m. a three-man, emergency repair crew arrived and removed the manhole cover to vent the gas from the vault. The repair crew was composed of supervisory personnel because regular gas company employees were on strike. The crew foreman walked down the street to determine the location of the gas main by examining paving patches over previous repairs, while the other two men remained at the manhole. A short time later, the foreman heard one of the men call for help. The foreman found one man on a ladder in the manhole holding the other man, who was unconscious. The man on the ladder then lost consciousness and both fell back into the manhole. The foreman radioed for an ambulance and the fire department to help get the asphyxiated men out of the vault. At 5:00 a.m., firemen, wearing oxygen masks, removed the bodies from the manhole. The repairmen had not used the respiratory devices which were on the gas company truck. The National Fuel Gas Company's maintenance and operations manual specified that:

- (a) No one shall be permitted to enter a vault or manhole unless a test has been made for the presence of gas and for oxygen deficiency.

- (b) Workmen entering a vault containing gas concentrations or oxygen deficiencies shall use an approved respiratory device and have a lifeline attached to their body.

The autopsies on the repairmen revealed that the cause of death was asphyxia due to carbon monoxide (CO) inhalation. Five thousand to 10,000 parts per million (ppm) (0.5 to 1.0%) of CO in air can cause death in 2 to 15 minutes. ^{1/} A sample of the coke-oven gas taken the day after the accident was analyzed and was found to contain approximately 7 percent carbon monoxide.

The day after the accident, a 12-inch-diameter, bare steel gas main, which transported manufactured (coke-oven) gas under the street, was excavated. A leak was found in the pipe 200 feet away from the manhole. The coupling components including many of the bolts used to join the pipe lengths had rusted; this gas main was not protected cathodically in accordance with 49 CFR 192.457. Gas, escaping at 10 psig pressure, had entered the telephone conduit through a joint in the clay telephone duct located 6 inches from the gas main. Gas had traveled through this conduit and into the manhole and vault. A mobile flame ionization leak survey had been conducted over the gas main 2 days before the accident, but no indication of leaking gas had been detected.

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

Reemphasize to all supervisory and operating personnel the importance of carefully following established procedures for working in vaults and manholes. (Class I, Urgent Followup) (P-77-9)

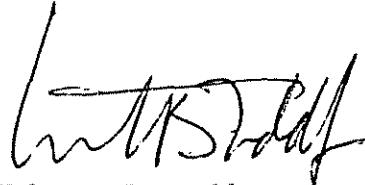
Excavate, on a random sample basis acceptable to the New York Public Service Commission, to determine if other bolted couplings have deteriorated on this 12-inch gas main and make the necessary repairs or replacements. (Class I, Urgent Followup) (P-77-10)

Coordinate with local electric companies, telephone companies, water and sewer departments, and other street facility owners to install signs at manholes alerting persons to the hazards of entering before checking for gas content and oxygen deficiency along the route of this manufactured gas pipeline. (Class II, Priority Followup) (P-77-11)

^{1/} Encyclopedia of Chemical Technology, second edition, 1972.

Protect cathodically this 12-inch bare steel gas main so that continuing corrosion will not result in a condition that is detrimental to public safety. (Class I, Urgent Followup)(P-77-12)

TODD, Chairman, BAILEY, Vice Chairman, McADAMS and HOGUE, Members, concurred in the above recommendations. HALEY, Member, did not participate.

A handwritten signature in black ink, appearing to read 'Webster B. Todd, Jr.', written in a cursive style.

By: Webster B. Todd, Jr.
Chairman