

P-76A Not Disc'd Re: P-77-13 and 14

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: June 24, 1977

Forwarded to:
Dr. Eula Bingham
Assistant Secretary for
Occupational Safety and
Health
Department of Labor
200 Constitution Avenue, NW.
Washington, D.C. 20210

SAFETY RECOMMENDATION(S)

P-77-13 and P-77-14

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.

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- (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.

The Occupational Safety and Health Administration (OSHA) of the Department of Labor has standards for testing for the presence of combustible gases and for oxygen deficiency in vaults and manholes operated by the telecommunication and power industries but not for vaults and manholes operated by the gas industry. Carbon monoxide and methane, two of the main constituents of coke-oven gas, are not listed under the hazardous materials section of the OSHA standards.

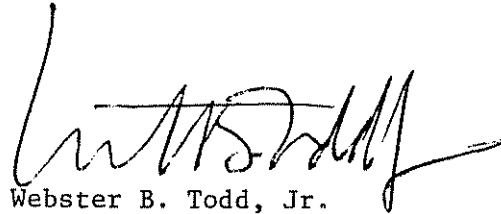
Therefore, the National Transportation Safety Board recommends that the Occupational Safety and Health Administration of the Department of Labor:

Amend its regulations for testing of atmospheres to include all underground vaults and manholes and to include safety standards for workers from other industries that may have occasion to enter these potentially dangerous areas. (Class III, Longer Term Followup) (P-77-13)

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

Amend its regulations to include all possible toxic substances or hazardous materials that might reasonably be found in vaults and manholes and to require that persons entering these areas be provided with appropriate devices to test the atmosphere before entering to insure their safety. (Class III, Longer Term Followup) (P-77-14)

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

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

By: Webster B. Todd, Jr.
Chairman