The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research

Three Sanitation Workers and One Policeman Die in an Underground Pumping Station in Kentucky

Death in the Line of Duty...A summary of a NIOSH fire fighter fatality investigation

F85-31 Date Released: July 23, 1985

Introduction

On July 5, 1985, one police officer and two sewer workers died in an attempt to rescue a third sewer worker, who had been overcome by sewer gas at the bottom of an underground pumping station. All four persons were pronounced dead upon removal from the station.

Synopsis of Events

On July 5, 1985, at approximately 10 a.m. two sewer workers (27 and 28 years of age) entered a 50-foot-deep underground pumping station. The station is 1 of 12 that pump sewage to the city's waste water treatment plant. The workers entered through a metal shaft (3 feet in diameter) on a fixed ladder that lead to an underground room (8 feet by 8 feet by 7 feet). The ventilating fan was not functioning. Neither worker was wearing personal protective clothing or equipment.

The two workers proceeded to remove the bolts of an inspection plate from a check valve. The plate blew off allowing raw sewage to flood the chamber, overwhelming one of the workers. The second worker exited the pumping station and radioed the police department requesting assistance. He again entered the station and was also overcome. Two police officers responded to the call at approximately 10:09 a.m. and one officer entered the pumping station. Later the sewage systems field manager arrived on the scene and followed the officer into the pumping station. None of the rescuers returned to the top of the ladder. A construction worker, who was passing by the site, stopped and entered the station in a rescue attempt. After descending approximately 10 feet into the shaft, he called for help. The second police officer assisted the construction worker out of the shaft. None of the responding men wore respirators.

Fire department personnel arrived at the accident site at approximately 10:11 a.m. One fireman, wearing a self-contained breathing apparatus (SCBA), entered the shaft, but could not locate the four men. By this time sewage had completely flooded the underground room. The fireman exited the pumping station. A second volunteer fireman (6'8", 240 lbs.) entered the shaft wearing a SCBA and a life line. As he began his descent he apparently slipped from the ladder and became wedged in the shaft approximately 20 feet down. (His body was folded with his head and feet facing upward.) Not being able to breathe, he removed the face mask and lost consciousness. Rescuers at the site extricated the fireman after a 30 minute effort. No further rescue attempts were made, until professional divers entered the station and removed the bodies. Autopsy results revealed a considerable amount of sewage in the lungs of the sewer workers and only a trace of sewage in the lungs of the field manager and police officer.

Recommendations/Discussion

Recommendation #1: Employers should develop proper work procedures and should adequately train employees to maintain and repair the sewage system. This training should include recognition of potential hazards associated with failures within those systems.

Discussion: The sewer workers did not have an understanding of the pumping station's design; therefore, mechanical failures and hazards associated with those failures were not adequately identified. Records were not kept of mechanical failures or repairs. The sewer workers "believed" that a malfunctioning valve had previously been repaired. This valve permitted the pumping station to flood. The lack of training resulted in the employee not being able to properly isolate the work area from fumes and sewage seepage.

Recommendation #2: Employers should develop comprehensive policies and procedures for confined space entry.

Discussion: Prior to confined space entry, all procedures should be documented. All types of emergencies and potential hazardous conditions should be addressed. These procedures should minimally include the following:

1. Air quality testing to assure adequate oxygen supply, adequate ventilation, and the absence of all toxic air contaminants;

2. Employee and supervisory training in the selection and usage of respiratory protection;

3. Development of site-specific working procedures and emergency access and egress plans;

4. Emergency rescue training;

5. Availability, storage, and maintenance of emergency rescue equipment.

The air quality was not determined before the sewer workers entered the confined space and the ventilation system was not functioning properly. One respirator was available for use; however, it was not appropriate for the chemical contamination (sewer gas) present. Life lines were not available. Once confined space pre-entry procedures are developed, employees should be trained to follow them.

Recommendation #3: Fire fighters, police officers, and others responsible for emergency rescue should be trained for confined space rescue.

Discussion: A police officer died in the rescue attempt of the sewer workers. The police officer was not trained in confined space rescue techniques and did not recognize the hazards associated with the confined space. The volunteer fireman, who attempted the rescue and wedged himself inside the shaft, should not have been allowed to enter. His size alone created a potential hazard for himself and the incident delayed possible rescue of the victims. Emergency rescue teams must be cognizant of all hazards associated with confined spaces, including rescue hindrances, and they should wear proper personal protection and devices for emergency egress.

This page was last updated on 11/21/05
Last Reviewed: November 18, 2015