The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research

Steel Worker Dies in an Industrial Waste Pit in Pennsylvania

FACE 8615

Introduction:

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR) is currently conducting the Fatal Accident Circumstances and Epidemiology (FACE) Project, which is focusing primarily upon selected electrical-related and confined space-related fatalities. The purpose of the FACE program is to identify and rank factors that influence the risk of fatal injuries for selected employees.

on January 9, 1986, a 58 year-old steel worker died as the result of falling into an industrial waste pit.

Contacts/Activities:

The coroner for Allegheny County, Pennsylvania notified the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR) of this fatality, and requested technical assistance. This case has been included in the FACE project. On February 24, 1986, two members of the DSR Research Team conducted a site visit, met with company representatives, and photographed the accident site.

overview of Employer's Safety Program:

The victim worked for a large steel company employing over 30,000 employees nationwide. This particular plant employs approximately 1000 personnel. A written safety policy and safety programs have been developed and implemented. On-the-job training and classroom presentations are used to train employees concerning safety. The company promotes safety through the use of safety evaluations of the plant, company publications, and incentive programs.

Synopsis of Events:

On January 9, 1986, a crew of four equipment repair technicians were assigned the task of changing a steam operated vertical pump. The top of the vertical pump extended above an industrial waste pit (l2'x22'xl2'), which was a collection point for wastes from coke oven operations (see Figure 1). The top of the pit is covered with several pieces of one inch thick steel &rating that was not secured. Parts of the pit were also covered with unattached, corrugated steel sheeting. This sheeting was to direct the fumes being emitted from the pit away from the working areas. The pit is usually filled with

approximately 10-11 feet of material (i.e., light tars, light oils, water, and naphthalene) and the temperature of the material is approximately 160-180 degrees Fahrenheit. The steam operated pump was used as the back-up for an electric pump that was normally used to pump the material from the pit to other parts of the coking operation for further processing.

In order to replace the steam pump it was necessary to disconnect the pump and the lines and to remove the steel sheeting and a section of the grating in front of the pump. Removal of the grating was required so that the suction connections on the bottom portion of the pump would clear the pump opening. This work had been accomplished and preparations were being made to remove the pump using a small articulated boom crane. Two workers were standing in front of the existing electric pump, which was located approximately four to six feet from the steam pump that was to be removed. The weight of the two workers was supported by a piece of steel grating measuring 22 inches by 42 inches. The unsecured steel grating was resting on two I beams, one I beam under each of the short sides of the grating. The I beams were covered with tar and condensation, the presence of which may have contributed to the incident. Without warning the grating slipped from the edge of the I beam and fell into the pit. One worker fell into the pit along with the grating; however, the other worker was able to straddle one of the I beams and avoid injury.

Apparently, when the crew was removing the grating (in front of the steam pump) adjacent to the piece of grating on which the workers were standing, the grating was bumped and moved closer to the edge of the I beam. The movement of the workers may have dislodged the piece of grating, causing the worker and the grating to fall into the industrial waste pit. The victim's body was recovered approximately 45 minutes later, and the victim was pronounced dead at the scene of the accident.

There was no written standard operating procedure for this task (changing a steam operated vertical pump) at the time of the incident. Although the victim had over 30 years experience with the company, including 2 years service as an equipment repair technician, this was the first time he performed this task.

Cause of Death:

The county coroner determined the cause of death to be due to suffocation and burns.

Recommendations/Discussion:

Recommendation #1: Lifelines, safety belts, and lanyards should be used by workers when performing work around and over the open industrial waste pit.

Discussion: In this incident, the victim fell into the pit when the grating, on which he was standing, slipped into the pit. Proper connection to a lifeline may have prevented the victim from falling into the pit.

Recommendation #2: Employers should enforce existing regulations regarding pits.

Discussion: OSHA Standard 1910.23 (a)(5) requires that "every pit and trapdoor floor opening, infrequently used, shall be guarded by a floor opening cover of standard strength and construction" which should be secured. "While the cover is not in place, the pit or trap opening shall be constantly attended or shall be protected on all exposed sides by removable standard railings." Additionally, the grating should be secured to eliminate lateral movement. The lateral movement of the grating contributed to the occurrence of the fatality.

Recommendation #3: Larger base plates on the pumps over the industrial waste pit should be installed. A temporary railing around the pump should be in place, prior to removing the pump from the pit.

Discussion: Larger pump base plates would allow the removal of the pump and associated suction connections without disturbing the grating, thus limiting the size of the floor opening and reducing the exposure of the employees to this hazard. Prior to removing the pump, a temporary railing should be installed around the pump to protect workers after the pump is removed.

Recommendation #4: The contents of the industrial waste pit should be identified and a health hazard control program based on the health hazards of the contents should be implemented.

Discussion: The employer should identify the contents and any associated health hazards of the industrial waste pit. Personal protective equipment applicable for work in or around the industrial waste pit should be used. Based on this evaluation, researchers could not determine what, if any, role the contents of the pit played in the fatal outcome of the incident; however, further evaluation should be completed by the employer.

Recommendation #5: When performing maintenance in and around the industrial waste pit, rescue procedures should be established to handle any emergency that might arise.

Discussion: In this incident the victim was not recovered from the pit for approximately 45 minutes. A pre-established rescue procedure would have expedited his removal from the pit and may have prevented the fatality.

Return to In-house FACE reports

Last Reviewed: November 18, 2015