The National Institute for Occupational Safety and Health (NIOSH)

Apprentice Boilermaker Falls 122 Feet to His Death in New Jersey

New Jersey Case Report: 90NJ007 (formerly NJ9005)

DATE: November 13, 1990

SUMMARY

A 20-year-old apprentice boilermaker, who was acting as a fire watch, died at approximately 3:30 a.m. on May 31, l990 as a result of a 122 foot fall. He was employed by one of several construction companies that were contracted to refurbish very large exterior structures at a petro-chemical plant. Working at night, the victim was assigned the task of watching for, and extinguishing, fires created by the welding process. After using a portable fire extinguisher, the victim fell between a sloping wall and an adjacent walkway to his death. New Jersey FACE investigators concluded that, in order to prevent similar occurrences in the future, the following safety guidelines should be followed:

- Employers must provide safety training, to all employees, which addresses the safety hazards of each job at a work site,
- Employers and supervisors should question employees about their knowledge of the use of new tools or new tasks. They should anticipate lack of knowledge about safety and should not wait for employees to raise questions,
- Employers must provide, and all workers use, fall protection whenever there is a danger of a serious fall,
- Supervisors and workers should keep a careful accounting of the location of all employees.

INTRODUCTION

On June 4, 1990 New Jersey FACE project personnel learned about the work-related death of a 20-year-old apprentice boilermaker during telephone contact with an OSHA area director. OSHA compliance officers investigated the fatal fall on June 1 and accompanied FACE personnel to the site again on June 5. We met with the employer, day foreman, shop steward and plant safety officer and talked with the victim's direct supervisor by telephone. Photographs were taken. The incident was investigated by detectives from the local police department immediately after the fatality. Information about the employer's and foreman's statements was derived from the OSHA file and the police detectives' report.

The employer is a large multi-state heavy-construction firm which employs 1400 persons, 250 of whom were at the site of this petro-chemical plant. Many employees are hired temporarily through union halls for specific projects. The firm has been in business for three years. The victim had been an apprentice boilermaker for eleven weeks and was hired for this project through his union, 5½ weeks before the incident. He worked the 6 p.m. to 3:30 a.m. shift.

All new employees, including those of contractors at the plant site, attend a mandatory 2½ hour training session, required by the plant. The contractor's engineer spends about 45 minutes of this time giving an oral presentation on personal protection equipment, hazard communication, evacuation and other related topics. The construction company gives no safety training specific to jobs and has no written safety rules or standards. The construction company's site managers assume that any worker hired through the union is knowledgeable about his craft. They also assure that if a worker is given a job to do, he will ask his foreman how to do it. The employer depends upon the worker to ask for assistance. Tool box safety meetings are supposed to be held daily. The employer gives no formal fire fighting program. A "Fire Watch Instruction" sheet is distributed to workers but it is unspecific about the use of equipment, exact methods of fire fighting, safety, or when to cease fighting the fire and call for help.

INVESTIGATION

The large scrubber which the company was repairing and refurbishing is about 200 feet high. The section on which the victim was working is conical in shape with the wider dimension of the cone on a lower level, becoming narrower with increased height. (See photo number 1.) It is constructed of steel, possibly painted many years before, now rusted in several areas. The tower is accessible by a guarded, wrap-around staircase and walkways made of unpainted carbon steel with a "diamond plate" pattern. Working platforms are at several levels All areas are guarded by outside railings. Many areas are protected by inside railings.

On the night of the incident, the victim was functioning as a fire watch, one of his duties as an apprentice boilermaker. His job was to put out fires caused by welding sparks. A small fire started in wooden beams approximately 20 feet below the area where three welders and the victim were working. After being called by the foreman to put the fire out, the foreman witnessed the victim descend to that area and extinguish the flames using an ABC fire extinguisher (active ingredient monoammonium phosphate.) The victim did this while standing on the wooden platform above the burning beams (See photo number 2.)

The foreman, who supervised 17 men that night, felt the fire was out and left to check on other workers. The welders remained at the upper level and continued their work.

Upon coming back to the area, the foreman looked for the victim because he had another job for him to do, but was unable to locate him. He used his portable radio to contact another supervisor below to see if he had seen the victim and questioned other workers. No one had seen the victim. Since their shift was ending, it was assumed he had used an alternate area of descent and left to go home. There had previously been a problem with other workers not punching their time clocks when leaving at the end of their shifts but the foreman did not check to see if the victim had punched out. The victim's body was found two hours later, at 5:15 a.m., by an employee of another construction company. That employee also reported seeing a hard hat on the ground earlier but had not been alarmed by it. The next shift was not scheduled to start until 7 a.m. The plant's emergency services team was summoned (emergency medical technicians) and responded in minutes. After arrival of the hospital paramedic unit, the victim was pronounced dead at the scene via telemetry

The local police department was called immediately, and detectives conducted an on-site investigation.

It is unknown what precipitated the fatal fall since there was no witness to the event. Based on physical evidence at the scene, apparently the fire watch emptied his fire extinguisher and left it on the platform on which he fought the fire. He then descended from the platform via a ladder, to the walkway below and partially emptied a new fire extinguisher on the wooden beams which were now above his head. Although the platform on which the victim originally fought the fire was poorly lighted, the walkway was well lit.

The victim and his fire extinguisher slipped between the interior edge of the walkway and the sloped vessel wall at an area which was protected by a railing. (See photo number 3.) There was enough momentum to his fall to project him down and out past the next lower walkway. He landed on the ground on gravel and crushed stones, 122 feet below, immediately next to a compressor truck tire on which he struck his head.

Slide marks and red paint markings, presumed to be from the fire extinguisher, were noted by two detectives on the scene immediately after the accident. Scuff marks on the residue on the face of the scrubber were also noted. The powdery residue of the monoammonium phosphate may have been slippery. It is possible that this slipperiness and the weight and bulkiness of the fire extinguisher may have been contributing factors in the fall.

The area of the scrubber where these markings were noted was protected by a railing between the edge of the walkway and the vessel wall. Here the distance between the walkway and the wall ranged from 16 to 28 inches. (See photo number 4.) The victim apparently fell between the railing and the wall. He fell with his hard hat, safety glasses and fire extinguisher.

CAUSE OF DEATH

The medical examiner gave the cause of death as multiple trauma.

RECOMMENDATIONS/DISCUSSIONS

Recommendation #1: Safety instructions should be given to each employee when starting a new task.

Discussion: It cannot be assumed that each employee, especially one who is young and new, will recognize his lack of knowledge or that he will ask questions regarding safe use of new equipment. Safety training should be specific to tasks. The victim was never taught specifics of the task of fire fighting nor did he have any hands-on training. This is an alleged violation of 29 CFR 1926.21(b)(2)1. Safe fire fighting skills should be taught to all employees who function as fire watchers.

Recommendation #2: Fall protection equipment must be provided and used whenever there is a danger of a serious fall.

Discussion: If the victim was wearing a safety belt or harness, he could have tied off when he found himself in an area of a risk of a fall. The welders routinely wore safety belts but the victim, who worked at the 155 foot level with them, was never issued one. The employer and foreman felt that a fire watch never works on any area which is unprotected and questioned the safety of a fire watch being tied off while fighting a fire. In a report issued by the plant workers' union, prior to the fatality, it was recommended that a fire watch be equipped with a safety harness in case he needed to be tied off. OSHA issued citations based on alleged violations of 29 CFR 1926.28(a)2 and 29 CFR 1926.105(a)3.

Recommendation #3: Workers and employers should be aware of the location of other workers, especially during shifts with small numbers of persons on site, and at night.

Discussion: It is not possible to suggest guidelines which fit all situations; but each employer-employee group must determine ways in which they can best remain aware of the safety and location of each other. This is especially important during night shifts, or when working in areas with hazards

REFERENCES

1. 29 CFR 1926.21(b)(2) Codes of Federal Regulations, Washington, D.C.: U.S. Government Printing Office, Office of the Federal Register.
2. 29 CFR 1926.28(a) Code of Federal Regulations. Washington. D.C.: U.S. Government Printing Office, Office of the Federal Register.
3. 29 CFR 1926.105 (a) Code of Federal Regulations, Washington, D.C.: U.S. Government Printing Office, Office of the Federal Register.

FATAL ACCIDENT CIRCUMSTANCES AND EPIDEMIOLOGY (FACE) PROJECT

Staff members of the FACE project of the New Jersey Department of Health, Occupational Health Service, perform FACE investigations when there is a work-related fatal fall or electrocution reported. The goal of these investigations is to prevent fatal work injuries in the future by studying: the working environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

To contact New Jersey State FACE program personnel regarding State-based FACE reports, please use information listed on the Contact Sheet on the NIOSH FACE web site. Please contact In-house FACE program personnel regarding In-house FACE reports and to gain assistance when State-FACE program personnel cannot be reached.

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Page last reviewed: November 18, 2015
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