MIFACE INVESTIGATION: #03MI020

SUBJECT: School Custodian Dies From Blood Clots After Fall From Ladder

Summary

On Friday, February 21, 2003, a 39-year-old substitute school custodian fell attempting to change a burned-out light bulb located 16 feet high on the back wall of an auditorium stage at approximately 1:30 p.m. When he fell, he was working alone. He called 911 on his cell phone. He told those who arrived to help that he had fallen from the second step from the top of a six-foot step-ladder. This distance would have been approximately five feet. He fell to the stage floor, wood covered with linoleum. When help arrived, he was found 5-10 feet from the back wall of the stage pretty much directly below the burned out light with his head toward the auditorium seats and his feet toward the back wall of the stage. His right arm was "hugging" a 6-foot aluminum and fiberglass step ladder in good condition that was lying on the stage floor in the closed position next to him. A play set constructed like a room with a roof and used in the play "Fiddler on the Roof" was located to the right of the victim as shown in Figure 1. The play set was approximately 8 feet high and 8 feet wide and on coasters. According to the police report of the incident, he complained of severe pain in his ankles and knees when he attempted to move them. He was transported to a local hospital. Subsequent examination indicated that his right leg was broken. His injuries required surgery. On Tuesday, February 25, 2003, following his fall and prior to surgery, he died from a pulmonary embolus (blood clot). The medical examiner stated that the victim "died of a pulmonary embolus which originated from deep vein thromboses of the calves of both legs. Fracture of the right leg, sustained in a fall contributed to the formation of the clots and to (his) death."

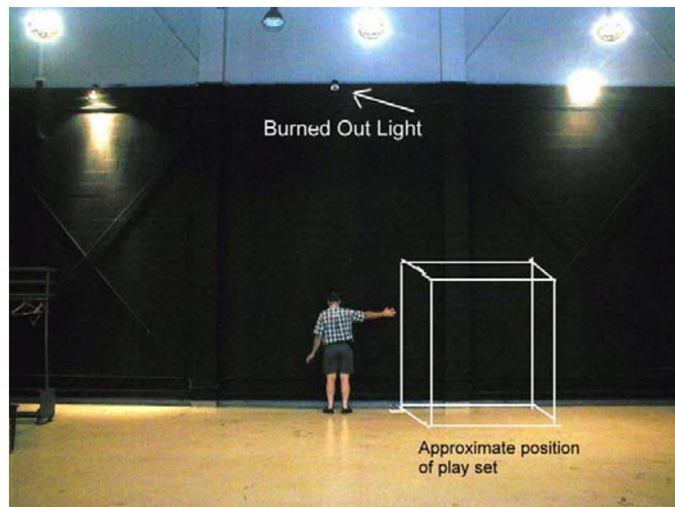

Figure 1

RECOMMENDATIONS

- A job hazard analysis (JHA) should be conducted by a safety professional on all tasks performed by the custodial staff. Once these JHAs are completed, they should be evaluated by a safety professional so that standard operating procedures for the tasks can be developed that would allow work to be performed in the safest possible manner. .

- Schools should provide safety training to the custodial staff based specifically on the job hazard analysis, so workers are aware of and follow the standard operating procedures necessary to safely perform a work task.

- A person or persons with knowledge of safety procedures and rules should be identified to assign and direct the work of the custodial staff.

Keywords: Fall, Other

- Schools should consider replacing lights at heights with long-life bulbs and should purchase and use flood light bulb changers with extension poles for changing lights.

INTRODUCTION

On Friday, February 21, 2003, a substitute 39-year-old school custodian fell from a six-foot step-ladder while attempting to change a burned-out light bulb 16 feet high on the back wall of an auditorium stage. He died from a blood clot the following Tuesday while he was being prepared for surgery. On February 26, 2003, MIFACE investigators were informed by the Michigan Occupational Safety and Health Administration (MIOSHA) personnel who had received a report on their 24 hour-a-day hotline that a work-related fatal injury had occurred. On April 23, 2003, the MIFACE researcher interviewed the superintendent of the school district who had been the deputy superintendent at the time of the incident. The superintendent described the events on the day of the fatality as they had been told to her by those who had responded to the custodian's 911 call for help. On August 5, 2003, the interviewer returned to the school to speak to the school's athletic director who had been at the school at the time of the incident and one of the first to reach the scene of the incident. The superintendent of schools and the athletic director on separate occasions accompanied the MIFACE researcher to the auditorium stage, showed her the light on the back wall that was to have been replaced, and allowed her to take photographs of the back wall. During the writing of the report, the autopsy, the responding EMS and police department reports, photographs, and the MIOSHA citation were obtained, and the MIOSHA file was reviewed.

The school district for whom the custodian worked employed approximately 325 employees, 29 of whom had the same job title as the victim, custodian. The custodians with permanent full-time employment at the school were represented by a union. Although the victim worked full-time, he was not a member of the union because of his substitute status. At the time of the incident, he had been working as a substitute custodian for approximately three months on the afternoon shift. He was substituting for a permanent custodian who was on sick leave. The school district considered him a temporary employee, because the position belonged to the custodian on sick leave. He would have been eligible for a full-time permanent position had one become available.

He had not received specific training from his employer for the task he was doing at the time of the incident. He was working alone. He had worked as a custodian for a nearby school district over the year and a half before he came to work at this school district. His responsibilities included cleaning and changing lights in the school auditorium, choir room, band room, and several classrooms. He was working on the day shift when the incident occurred, because the school was closed for a week for winter break, and all the custodians were working the day shift. This employer had never had a fatality occur.

The deputy superintendent of schools had primary responsibility for safety at the school. She reported to the school board. Safety responsibilities were not delegated to anyone else. She had no safety training. The school had a written health and safety program, but no written safety training program. Safety training was occasionally provided by the school's insurance carrier. Most of the training for the custodians was on-the-job training.

The MIOSHA investigation resulted in one Serious violation being issued to the school under General Provisions, Part 1, Rule 11(a) for failing to provide training to each newly assigned employee regarding the hazards of the job (No training for employee changing floodlight type bulb 16 feet above the floor at the back wall of the school stage area).

INVESTIGATION

On Friday, February 21, 2003, a 39-year-old substitute school custodian fell attempting to change a burned-out light bulb located 16 feet high on the back wall of an auditorium stage at approximately 1:30 p.m. He had tried to change the bulb that morning by standing on the stage floor and reaching with a long reach pole and gripper but had been unsuccessful. He had related this information to other custodians in the building and had indicated that he would need an extension ladder to do the task. The school also had a man-lift available that could have been used to change the light bulb, but the victim was not trained to use it.

Figure 2 Ladder involved in fall

The school was on mid-winter break when the incident occurred, so the entire custodial staff including the victim was working on the day shift, 7:00 a.m. to 3:30 p.m. He normally worked on the afternoon shift from 3:00 p.m. to 11:00 p.m.

When he fell, he was working alone. He called 911 on his cell phone. He told those who arrived to help that he had fallen from the second step of a six-foot step-ladder (Figure 2). This distance would have been approximately 5 feet. The stage floor was wood covered with linoleum. He was found 5-10 feet from the back wall of the stage pretty much directly below the burned out light with his head toward the auditorium seats and his feet toward the back wall of the stage. His right arm was "hugging" a 6-foot aluminum and fiberglass step ladder in good condition that was lying on the stage floor in the closed position next to him. The manufacturer's label indicated that the ladder was a 6-foot Model FS1006 class 1A with a rated capacity of 300 pounds manufactured in December, 1997. Broken glass littered the floor around him. A play set shaped like a room with a roof that was being used for the play "Fiddler on the Roof" stood where outlined in Figure 1. The play set was approximately 8 feet high and 8 feet wide and on coasters.

According to the police report of the incident, he complained of severe pain in his ankles and knees when he attempted to move them. Apparently he had gotten to his feet before help arrived. The emergency medical personnel report indicates, "the ladder seems to have gone out from under him, (he) walked to a chair, waited, then got up and fell again to (the) floor as a result of the pain." The victim weighed close to 300 pounds. He was transported to a local hospital. Subsequent examination indicated that his right leg was broken. His injuries required surgery. On Tuesday, February 25, 2003, following his fall and prior to surgery, he died from a pulmonary embolus (blood clot).

Earlier during the day of the incident he told one of the other custodians that he was going to get the "bulb gripper" extension pole to change the light. These bulb changes were often done with a man lift. The victim knew he was not certified to use the man lift, because his lack of training had prevented him from using the lift on other jobs. He had another conversation around noon with the school athletic director during which he indicated he was going to have to get an extension ladder, because he was not able to change the light with the extension pole. The light he had been trying to change was a floodlight type bulb. The extension pole with a "bulb gripper" did not work, because the gripper was designed for typical

standard light bulbs, not the floodlight type bulbs in use. After his fall, the extension pole was seen hanging on the wall in the custodian's closet.

Why he had taken a six-foot ladder and not an extension ladder to the stage to change the bulb is not known. How the ladder became closed next to the victim is not known. Perhaps it was leaning against the stage or the play set and slipped. The MIFACE investigator was told that school policy dictated that two custodians should be present when work was being conducted with an extension ladder. Perhaps another custodian was not available to assist him, so he decided to do the job alone.

Figure 3 Sticker on ladder involved in fall

A memo issued by the district superintendent shortly after the fall indicated a lack of knowledge of ladder safety. It stated, "Please talk with your custodial staff and remind them that when using ladders to complete repairs in the buildings to use their *best judgement.* If work is being completed that requires climbing to the very top of the ladder a second person should be a spotter." This incorrect and hazardous procedure was noted and addressed in subsequent ladder training. Stickers on portable ladders advise the user not to use the top step. The ladder involved in this fall was clearly marked with this warning (Figure 3).

CAUSE OF DEATH

The cause of death as stated in the medical examiner's report was that "the decedent died of a pulmonary embolus which originated from deep vein thromboses of the calves of both legs. Fracture of the right leg, sustained in a fall contributed to the formation of the clots and to the death". No toxicology testing for drugs or alcohol was done.

RECOMMENDATIONS/DISCUSSION

- A job hazard analysis (JHA) should be conducted by a safety professional on all tasks performed by the custodial staff. Once these JHAs are completed, they should be evaluated by a safety professional so that standard operating procedures (SOPs) for the tasks can be developed that would allow work to be performed in the safest possible manner. .

Because a school is supposed to be a safe environment for children, one tends to overlook the hazards associated with maintaining its facility and grounds. A written safety plan is dangerous if it contains erroneous information. JHAs conducted by a safety professional should identify the proper equipment or tools to be used to perform the tasks safely. In this instance, the man lift available on site would have provided the safest means to change the bulb. The victim was following safe procedures, because he knew he was not trained to use one. Using an extension ladder in the presence and with the assistance of a second custodian would have been the next best solution. The victim indicated he was going to use an extension ladder, but did not. Perhaps in his desire to be regarded as someone who could get the job done efficiently, he tried to change the bulb alone instead of "bothering" one of the other custodians to help him.

Written standard operating procedures (SOPs) provide many benefits to an organization. Among the benefits are: removing variation in work performance caused by different people doing the same job, facilitating employee job training as well as cross-training, providing a common understanding of the job and expectations for job performance, helping to provide a safe work environment by assessing hazards and providing ways to minimize the identified hazards/risks.

- Schools should provide safety training to the custodial staff based specifically on the job hazard analysis, so workers are aware of and follow the standard operating procedures necessary to safely perform a work task.

When the job hazard analysis is completed, the custodians should receive training based on the analysis. A written plan is of little value if its procedures are not understood and followed by all. Some tasks will be identified as more hazardous than others. The details of what happened to cause the victim to fall are not known. Perhaps the extenders were not fully open. Perhaps they were open but closed when it fell. Perhaps he was leaning the ladder against something. The ladder had a 300 pound load rating, so the fact that the victim weighed close to 300 pounds should not have made a difference. Training everyone according to the plan specifically developed for the school would ensure consistency of information and expectations.

- A person or persons with knowledge of safety procedures and rules should be identified to assign and direct the work of the custodial staff.

Presently the safety function is the responsibility of an individual who has little knowledge or experience regarding safe work procedures and rules and has administrative responsibility for the school. A person trained in safety procedures and regulations should be assigned the responsibility for coordinating all of the custodial safety activities of the school. That person would visit the various jobsites, identify potential hazards, and ensure that hazards are eliminated or addressed in a safe manner.

- Schools should consider replacing lights at heights with long-life bulbs and should purchase and use flood light bulb changers with extension poles for changing lights.

Schools have lights at high elevations in their auditoriums and gymnasiums. Replacing the lights with long-life bulbs will reduce the frequency and hazards associated with changing the bulbs. Flood light bulb changers are available in home improvement stores and through suppliers such as Grainger and Shiffler.

REFERENCES

1. Accident Prevention Manual for Business & Industry, Engineering and Technology, 11th Edition, National Safety Council, Chicago, 1997.

2. MIOSHA standards cited in this report may be found at and downloaded from the MIOSHA, Michigan Department of Labor and Economic Growth website at: www.michigan.gov/mioshastandards Also, MIOSHA standards are available for a fee by writing to: Michigan Department of Labor and Economic Growth, MIOSHA Standards Section, P.O. Box 30643, Lansing, Michigan 48909-8143 or calling (517) 322-1845.

3. U.S. Department of Labor Occupational Safety & Health Administration Standard Interpretation dated 06/11/1998 – Load ratings for portable ladders.

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