Ohio FACE Investigation 990H063 -- A Window Washer Died as the Result of a 40-foot Fall from the Roof of a Three-story Building.

Investigative Authority:

The Ohio Department of Health (ODH) funded by the National Institute for Occupational Safety and Health (NIOSH) is a participant in the Fatality Assessment and Control Evaluation (FACE) Program. The FACE team conducts investigations of fatal workplace injuries. The goal is to identify the factors that are responsible for or contribute to the workplace injury with the objective of compiling recommendations to prevent future work-related injuries.

The ODH investigation included a site visit to take photographs of the incident site and interview building tenants; limited interviews with company officials; review of the police report; review of the coroner's autopsy report; and review of the investigation report by Occupational Safety and Health Administration.

Summary:

On Wednesday, February 3, 1999 a 22 year old window washer fell 40 feet from a three-story building sustaining multiple head injuries. He died Thursday February 4, 1999 as a result of the injuries sustained in the fall. A local window cleaning company that has been in business for more than one hundred years employed the victim. The company had no history of any fatal injuries before this incident. The victim had worked for the company for more than three years. He had cleaned the windows of this building on other occasions. The victim was training an employee in the use of the boatswain chair technique to wash windows. According to the report prepared by the OSHA investigator, the two workers set up the equipment by anchoring the roof roller to the air conditioning unit with one line, the safety or lifeline. The other line, the work line, was affixed to the roof roller and was not anchored to any site on the roof. The two workers successfully washed the windows on the front (north) of the building. They then returned to the roof to reposition the roof roller (scaffolding) in order to wash the windows on the side of the building (east). The co-worker disconnected the safety or lifeline securing the roof roller to its anchorage on the building's air conditioning unit, and had not yet attached it to its new anchorage. The co-worker had his back to the victim and did not see the victim attach his safety harness to the safety line of the roof roller and go over the edge of the building. The victim and the unsecured roof roller were found in the alley on the east side of the building. The victim was transported by fire department medics to the nearest level one trauma center, where he died the next day.

Recommendations:

- ***Test equipment before going over the side of a building to ensure proper anchorage of scaffolding.***
- ***Trainer should personally check all equipment especially when engaged in training exercises.***

- ***Suggest the use of specific anchorage devices for window cleaning equipment.***
- ***Emphasize communication and cooperation between co-workers.***
- ***Maintain separate anchorage points for safety lines and work lines.***
- ***Recommend the use of protective headgear.***

Investigation:

On February 3, 1999 the victim and co-worker were sent to wash the windows of a three-story building at 395 East Broad Street at approximately 8:00 a.m. While engaged in this task the victim was to train his co-worker in the use of the boatswain's chair technique to wash windows. The building has a mirrored glass front, facing north and four rows of windows on the side facing east.

The workers brought the following equipment with them to the site; one roof roller (Fitch Mule), a 200 foot (5/8 inch) nylon rope for a safety or lifeline, a 200 foot (7/16 inch) rope for a work line, a boatswain's chair, a Miller body harness, style 8095 (which was found in their truck after the incident), a 3½ foot lanyard with rope grab, personal safety harness belonging to the victim, three 50 pound counter weights and window washing equipment. The two workers carried the equipment with the exception of the Miller harness, to the roof of the building. They elected to use the personal safety harness of the victim instead of the Miller harness.

They had worked together once in the week before this incident. After assembling the roof roller (mule), they secured it to the air conditioning platform at the rear of the roof using one rope. The rope used was the safety or lifeline rope (200 foot 5/8 inch nylon) for the worker who would use the boatswain's chair. The rope was then tied to the back of the roof roller and across the top of the roof roller as a safety line. The other rope was attached to the rear of the roof roller and over the top of the roof roller for the work line. The co-worker was the first to use the boatswain's chair. The front windows were washed without incident.

Once this task was completed, the roof roller had to be repositioned to the lower part of the roof to reach the eastside windows. While the victim was returning to the roof, the co-worker disassembled the roof roller to move it. The co-worker stated he moved the roof roller and had his back turned in order to hang the weights and retie the roof roller. He did not see the victim attach himself to the roof roller and go over the side. He states he heard a scream and when he turned, he saw the roof roller and ropes fall off the roof. He approached the edge of the roof and observed the victim lying in the alley. He left and called for assistance. The co-worker states he does not know why the victim attached himself to the roof roller and went over the side since the two did not speak to each other immediately before the incident.

According to the report submitted by OSHA, the fire department medic confirmed the assertion that the victim attached the line to his safety harness and this was cut off the victim before the initiation of treatment by the fire department medic. The OSHA officer also interviewed the company foreman who expressed puzzlement as to why the victim did not have any window washing equipment with him when he went over the edge. Equipment found on the roof after the accident included one window washing bucket with equipment, one boatswain's chair with tackle, one lanyard with rope grab and three 50 pound weights.

During the period of time the workers washed the front windows they did have the roof roller attached to the A/C platform with one rope, the safety line. The OSHA investigation concluded that the method of

securing the roof roller to the air conditioner platform with one line and using that same line as the lifeline did not constitute a violation of CFR, 1910. There were no citations issued by OSHA.

Additional Information from Investigative File

The company's safety manual, which had a publication date of March 10, 1997 on the cover, was reviewed and revealed an adequate document articulating general safety and health guidelines. There was a statement affirming the company's policy on safety, followed by 17 general safety directives. There were procedures in place to report problems including daily logs, incident reports, and 3-step corrective action procedure for safety violations. There was not an opportunity to determine the frequency with which this manual was reviewed with employees, nor how the manual was initially communicated to employees at the time of hire.

Other information that was reviewed included a copy of the manufacturer's operations and specifications manual for the roof roller, chair and ropes used. The document contained recommendations for the proper use of the equipment. Another document, The Safety Requirements for Window Cleaning, prepared by the American Society of Mechanical Engineers, was also reviewed and forms the basis for three of the recommendations.

Recommendations / Discussion

#1 Equipment should be tested each time, before going over the side of a building to ensure proper anchorage and balancing of scaffolding.
Discussion: In this case the victim did not check to ensure proper anchorage of the roof roller before he attached himself to the roller and went over the side. According to the guidelines in the manufacturer's operations manual; "Before going over the side of a building, apply the total work load (worker, tools, water etc.) to the roller to ensure that the beam extension, angle of the beam, T-support position, and counter weight is all in proper proportion. It is an absolute must in terms of safety, that this rule is adhered to (Fitch-Operations)."

#2 When an employee is engaged in a training activity that employee should check the work of the trainee by testing all equipment before it is used.
Discussion: The trainer should have checked the equipment before attaching his harness to the roller and going over the edge of the building. According to the American Society of Mechanical Engineers, ASME, "employers shall instruct their window cleaning employees in the proper use of all equipment provided them and shall supervise the use of the equipment and devices to ensure that safe working practices are observed" (ASME 1995 3.4).

#3 Specific anchorage devices for window cleaning equipment should always be used.
Discussion: In this case, the roof roller was attached to the A/C platform. Under these circumstances it would be difficult to see the exact placement of the anchor because of the size of the A/C platform. The

American Society of Mechanical Engineers (ASME) recommends the installation and use of roof irons and anchors that are secure and capable of holding tiebacks with a breaking strength of 5400 lbs. or more. The anchors should be installed so that the tension is at right angles to the face of the building (ASME 5.3.1). In addition, each outrigger should be secured to a certified anchorage directly under the inboard end of the outrigger on the building during the entire period of their use. Said anchorage should provide a stability factor of four against overturning or upsetting of the outriggers (ASME 10.3.3).

#4 Employer should emphasize communication and cooperation between co-workers as part of a comprehensive safety program that includes a written safety manual and periodic documented review of the safety precautions included in the manual with employees.
Discussion: This company had a safety manual in place. It was not clear when, or how often the safety directives were reviewed with employees. The safety manual does not specifically address the nature and extent of communication that should occur between co-workers while on a window cleaning site.

#5 Maintain separate anchorage points for safety lines and work lines.
Discussion: In this case only one line was used to secure the roof roller to its anchorage site. Once this line was disconnected, there was no secondary hazard protection in place. The manufacturer (Fitch) recommends that "After properly tying off to an anchorage, connect the safety line to the roller. The optimum procedure for this is to tie a figure eight knot in the line and connect a carabiner to the knot and then to the counter weight bolt. This ensures that the rollers are fail-safe from going over the building edge under any circumstance (Fitch-Operations)."
ASME recommendations state, "A lifeline with a breaking strength of 5400 pounds or better, separate from the platform and its support, shall be provided for every person on such platform for the attachment of the lanyard from the person's safety belt or safety harness. Lifelines shall conform with American National Standard ANSI A 10.14" (ASME 5.2).

#6 Recommend the use of protective headgear.
Discussion: The victim was not wearing protective headgear at the time of the incident. Although the company safety manual does not stipulate the use of hard hats, there is research available to support the evidence that when hard hats are used in occupational settings a decrease in the occurrence and severity of head trauma has been observed.

REFERENCES

- ASME A39.1-1995 (1995). Safety Requirements for Window Cleaning. American Society of Mechanical Engineers, 345 East 47th St, New York, NY.
- Fitch Enterprises, Products for the High Rise Window Cleaner. 1224 N. 22nd St. Council Buffs, IA 51501. 1-800-323-1277.
- Office of the Federal Register: Code of Federal Regulations, Labor 1910 US Department of Labor, Occupational Health and Safety Administration, Washington D.C.

Front View of Building Accident Occurred

Side of Building Accident Occurred

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