



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Window Mechanic Dies in 250-Foot Fall

FACE 8949

INTRODUCTION

The National Institute for occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatal Accident Circumstances and Epidemiology (FACE) investigations when a participating state reports an occupational fatality and requests technical assistance. The goal of these evaluations 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.

On August 17, 1989 a 30-year-old male window mechanic died when he fell 250 feet through a window opening while attempting to replace the window.

CONTACTS/ACTIVITIES

State officials notified DSR of this fatality and requested technical assistance. On September 20, 1989 a DSR safety specialist and an epidemiologist conducted an investigation and met with local officials and the manager of the property where the incident occurred. The DSR representatives then visited and photographed the incident site and discussed the case with witnesses.

OVERVIEW OF EMPLOYER'S SAFETY PROGRAM

The victim in this incident was self-employed. He had worked in the glass business for several years prior to going into business for himself approximately 4½ years ago. The victim had one employee. The company had no safety program.

SYNOPSIS OF EVENTS

On the day of the incident, the victim and his employee went to a 21-story office building to replace a damaged window on the 21st floor. The exterior walls of the building were brick, with rows of windows, 9-feet-high by 56-inch-wide at each floor and on all sides of the building. These windows consisted of an outer pane of bronze-tinted glass and an inner pane of clear glass separated by a ½-inch air space. A single metal frame held the two panes of glass in place.

The outer pane of a window in one corner of a large conference room on the 21st floor broke several days prior to the incident. To prevent possible injuries to pedestrians, building security personnel, after making sure there was no one below, tapped on the inner pane and window frame to dislodge the broken pieces of glass, causing them to fall to the ground

below. The inner pane of glass was left intact in the frame.

The victim was contracted to replace the damaged window. He had replaced damaged windows in the same building on several previous occasions. To replace the window, the victim first had to loosen and remove the bolts which secured the window frame to the structure, and then remove the existing inner pane and frame from the opening. Subsequently, he could install a new window and frame combination in the opening, and complete the job by installing the bolts to hold the new frame in position.

The victim and his employee arrived at the incident site accompanied by a security guard. The victim began removing the bolts which held the window frame in place. In order to reach the bolts at the top of the frame the victim placed a 3-foot-high wooden stepladder next to the window. Standing on the second step of this ladder, he attempted to loosen one of the bolts (located above his right shoulder) by striking the bolt with a hammer held in his right hand. In doing so, he missed the bolt and struck the window pane. The window shattered under the impact of the hammer, and the victim and the ladder on which he was standing, fell sideways through the window opening to a brick courtyard 250 feet below.

The corporate security director observed the victim falling past his 14th floor office window and immediately had his secretary call local emergency services (911). Fire, rescue, and police personnel were on the scene within 7 minutes of the incident.

The victim was pronounced dead at the scene.

CAUSE OF DEATH

The medical examiner listed the cause of death as generalized trauma.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Fall protection options should be considered, and selected methods and/or equipment used whenever the potential for serious or fatal falls exists.

Discussion: Windows of the type involved in this incident are designed to be of sufficient structural strength and integrity to prevent someone from falling through them. However, when a window, or any other structural component, is damaged, and the resultant structural strength and integrity is not evaluated, any task or activity involving the damaged component should be approached with extreme caution. Had the work proceeded to the point at which the window was removed, the resultant unprotected wall opening would have posed a serious fall hazard to the workers installing the new window. In this case, the most prudent approach may have been to treat the damaged window as if it were an unprotected wall opening during the entire course of the dismantling and replacement work.

An Occupational Safety and Health Administration (OSHA) standard (29 CFR 1926.500(c)) requires that any wall opening "from which there is a drop of more than 4 feet, and the bottom of the opening is less than 3 feet above the working surface" be guarded. Since the removal of the window would have been impeded if not precluded by installation of a guardrail, and the use of a portable ladder may have offset the protection afforded by a guardrail anyway, this protective option would probably have been impractical in this instance. However, personal fall protection equipment, such as safety belts with lanyards attached to a structurally sound anchorage point, could have been employed instead. The use of personal fall protection equipment by maintenance personnel dismantling and replacing damaged windows, such as in this incident, may prevent future similar incidents.

While the men in this case were working within a completed structure, the work they were performing would have resulted in the creation of a large vertical opening when the window was removed. The fact that they were intending to create this opening should have prompted them to employ fall protection equipment (safety belts with lanyards) while accomplishing this work. Had they used this equipment this fatality could have been prevented.

Recommendation #2: Work near a known damaged window should be accomplished from the side rather than from directly in front of the window whenever possible.

Discussion: The work being performed by the victim at the time of the incident could just have easily been accomplished with the ladder (and the victim) positioned by an adjacent, undamaged, side window instead of directly in front of the damaged window unit. Had this been done this incident might have been prevented.

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