DATE: September 29, 1992

FROM: Fatality Assessment & Control Evaluation (FACE) Project
Minnesota Department of Health (MN FACE)

SUBJECT: MN FACE Investigation MN9203
Window Washer Dies After Falling Off of Hydraulic Lift

SUMMARY

A 58-year-old male window washer (victim) died when the hydraulic lift he was using tipped over backwards, and he fell approximately 40 feet to a marble floor below. MN FACE investigators determined that error in equipment set-up resulted in instability of the lift. There were many warnings on the lift about failure of proper set-up possibly leading to serious injury or death. There were, however, minimal equipment design features to prevent this from occurring. MN FACE investigators concluded that, in order to prevent similar occurrences, the following guidelines should be followed:

> manufacturers of equipment requiring set-up should design equipment so it cannot be incorrectly assembled;

> manufacturers of equipment requiring set-up should use engineering controls (electrical interlocks) which prevent operation in case of incorrect assembly; and

> employers should encourage employees to tie-off to a stationary support whenever using any aerial lift to ensure fall restraint.

INTRODUCTION

On May 14, 1992, MN FACE personnel were notified by a city police department of a work-related fatal fall that had occurred approximately one hour earlier. After coordinating with the MN OSHA compliance officer, a site investigation was conducted that same day. Police and the victim's employer representative were interviewed at the site. Reports from the city police and county coroner were requested.

The victim worked for a window washing company. It employs approximately 50 union employees and has extensive written safety rules and procedures as well as safety lectures/demonstrations on specific pieces of equipment and emergency response procedures. The 58-year-old victim had worked for the company for over 5 years and had been in the window washing business for the last 20 years. The victim was the Training Supervisor for the company.

INVESTIGATION

The incident occurred indoors in a well-lit, three-story building atrium area. The victim had just begun work in this area; he was working alone at the time of the incident. For this job, he was using a hydraulic lift, which went to a height of 39 feet. As an optional feature, an additional 5 feet can be added to the base of the lift for use in churches and other auditoriums where maneuvering around benches or pews is necessary. The operator of the lift works and controls the lift height from a one-man basket with guardrails and non-slip flooring.

The lift is stabilized during regular use by installation of four outriggers placed in a cross-like configuration at the lift base (Figure 1). Outriggers slip into rectangular attachment casings at the base of the lift and lock into place with a pin, which engages a hole in the outriggers. A level is also positioned at the base of the lift to check balance.

For use of the optional auditorium lift, installation of four additional outriggers is required during equipment set-up. These outriggers are identical to and, when in place, parallel to the regular outriggers. The casing openings for the auditorium outriggers are covered with a metal swivel covering with a warning to "not insert outrigger from this end" and that "improper use will result in serious injury or death." There are no locking pins in the auditorium outrigger casings. The auditorium lift option was used only infrequently by the company.

On the day of the incident the optional auditorium lift was not being used. Four outriggers, placed in the configuration shown in Figure 1, were needed for usual lift operation, and work site space adequately accommodated this set-up. The victim had installed the two side outriggers properly, but instead of installing the front and back outriggers in the proper cross-wise positions, had installed them in the auditorium outrigger casings parallel to the already installed outriggers (Figure 2). This resulted in the lift base being supported on the sides but unsupported in both the front and back.

According to a witness at the site, it appeared the lift began swaying as the bucket ascended and as it reached its full height tipped over backwards with the victim in the basket. A 911 call was placed and CPR administered by by-standers almost immediately, but the victim died on site soon after the fall.

CAUSE OF DEATH

The cause of death listed on the death certificate was blunt force to the chest and back injuries due to or as a consequence of a fall from height.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: When designing equipment, which requires correct user set-up for safe operation, manufacturers should use equipment design features, which reduce the likelihood of incorrect assembly.

Discussion: The outriggers used for support of both the regular and auditorium lift were the same size and shape. The only protective device to prevent incorrect placement of outriggers was a metal covering over auditorium outrigger casing openings. This cover could be easily lifted out of place for outrigger installation by the assembler/operator. One method for preventing incorrect set-up would be to design auditorium outriggers and casings of a different size and/or shape from those used for regular lift operation. Locking out casings for the auditorium outriggers to prevent actual physical installation of the regularly used outriggers may have prevented the incorrect set-up of the lift

Recommendation #2: When prevention of incorrect assembly by design cannot be achieved, manufactures should install electrical interlocks to prevent operation of incorrectly assembled equipment.

Discussion: For stability, the lift involved in this incident required that at least four outriggers to be placed in a cross-like configuration. Placements of additional outriggers were necessary only if the optional auditorium lift was used. An electrical interlock system, which rendered the lift inoperable if four outriggers were not properly installed in a cross-like configuration, may have prevented this fatality.

Recommendation #3: Employers should encourage employees using any type of aerial lift to tie-off to a stationary support above the working height.

Discussion: There are no legal requirements that employees tie-off to either the basket itself or a separate stationary support when using the type of lift involved in this incident. However, because there is always the possibility of equipment failure and in this case, collapse, it may be prudent work practice for workers to tie-off to a separate stationary support when working from any type of lift.