

**DATE:** March 26, 1997

**FROM:** Minnesota Fatality Assessment and Control Evaluation (MN FACE) Program  
Minnesota Department of Health

**SUBJECT:** MN FACE Investigation 96MN07901  
Grain Elevator Employee Dies After Falling From the Roof of a Grain Bin

## **SUMMARY**

A 48-year-old grain elevator employee (victim) died of injuries he sustained when he fell from the roof of a steel grain bin. On the day of the incident, the victim and two coworkers worked at various tasks associated with drying and storing recently harvested corn. Four storage structures were connected by horizontal conveyors that allowed grain to enter the structures through their roofs. Grain entered a specific structure when a sliding gate for that structure was open and similar gates for the other structures were closed. The workers determined that one of the storage bins was nearly full. They attempted to use a cable mechanism to open the sliding gate of another bin to begin filling it. After several unsuccessful attempts to open the gate, the victim and a coworker climbed to the top of the storage structures and accessed a guarded walkway along the side of the conveyors. They were not wearing fall protection when they went to the roof to inspect the slide gate that wouldn't open. They discovered that ice had accumulated on the slide mechanism of the gate and prevented it from opening. The victim climbed over the steel protective side rails of the walkway and stood on the sloped steel roof of the bin. While he held onto the metal framework of the walkway and attempted to open the gate, he lost his grip, slid down the bin roof and fell to the ground. While the coworker descended from the roof, other workers placed a call to emergency medical personnel. They arrived shortly after being notified and pronounced the victim dead at the scene. MN FACE investigators concluded that to reduce the likelihood of similar occurrences, the following guidelines should be followed:

- whenever work is performed at an elevation where the potential for a fall exists, fall protection equipment should be used; and
- employers should design, develop, and implement a comprehensive safety program.

## **INTRODUCTION**

On November 13, 1996, MN FACE investigators were notified of a work-related fatality that occurred on November 11, 1996. A site investigation was conducted by a MN FACE investigator on December 17, 1996. During MN FACE investigations, incident information is obtained from a variety of sources such as law enforcement agencies, county coroners and medical examiners, employers, coworkers and family members.

The employer in this incident was a commercial grain elevator company that employed approximately 70 employees. The victim had 15 years of experience working in grain elevators. The employer had a safety director who was responsible for safety programs and procedures. In addition, all employees were aware of a general company policy that workers should seek assistance or have someone else perform tasks that, even though they were trained to perform safely, they did not feel completely comfortable doing. The employer did not have written safety procedures for freeing the sliding gate that would not open.

## **INVESTIGATION**

On the day of the incident, the victim and two coworkers were working at a commercial grain elevator. Their primary work activities that day were associated with drying and storing corn that had been recently harvested by local farmers. The storage facilities consisted of a wooden grain elevator, a fiberglass silo and two steel grain bins. Each steel bin had a diameter of sixty feet and the sides of the bins were seventy feet high. Each bin had a storage capacity of 180,000 bushels. The four structures were positioned in a row starting with the wooden elevator at one end. The silo was located adjacent to the elevator followed by the two steel bins. A mechanical grain elevator known as a "leg" lifted grain to the top of the storage structures where a series of horizontal conveyors transferred it to the structures. Each storage structure had an opening in its roof that allowed grain to enter the structure. Each opening was connected via an enclosed chute to the conveyors and was fitted with a sliding gate or cover. Grain entered a specific structure when the gate for that structure was open and the gates for the other structures were closed. The gates could be independently opened and closed from the ground via a reel and cable system that extended up the side of the structure.

The bin furthest from the grain silo was being filled when the workers determined that it was nearly full. They attempted to use the reel and cable mechanism to open the sliding gate of the other bin to begin filling it. After several unsuccessful attempts to open the gate, the victim and another worker climbed up inside the wooden elevator and accessed a guarded "catwalk" or walkway along the side of the conveyors. They were not wearing fall protection when they went to the roof to inspect the slide

gate that wouldn't open. The workers walked along the catwalk to the area above the roof of the bin they wanted to fill and examined the slide gate. They discovered that ice had accumulated on the slide mechanism of the gate and prevented it from opening.

The victim climbed over the steel protective side rails of the catwalk and stood on the sloped steel roof of the bin while he attempted to open the slide gate. While he held onto the metal framework of the catwalk with one hand and attempted to open the gate, he lost his grip, slid down the bin roof and fell to the ground. While the coworker descended from the roof via the catwalk, other workers who saw the victim fall placed a call to emergency medical personnel. They arrived shortly after being notified and pronounced the victim dead at the scene.

## **CAUSE OF DEATH**

The cause of death listed on the death certificate was severe head and chest injuries.

## **RECOMMENDATIONS/DISCUSSION**

**Recommendation #1:** Whenever work is performed at an elevation where the potential for a fall exists, fall protection equipment should be used.

**Discussion:** The victim was working at an elevation where the potential for a fall of more than 10 feet existed. The catwalks that the victim walked along above the storage structures had guard rails to prevent workers from falling. However, in this case the victim left the guarded catwalk area and attempted to stand on the sloped steel roof of the bin without wearing fall protection equipment. Adequate fall protection equipment, such as lifelines, safety belts and lanyards, should always be used whenever the potential for a fall exists. If the victim had been using fall protection equipment (i.e., lifeline, safety belt, and lanyard), this fatality probably would have been prevented.

**Recommendation #2:** Employers should design, develop, and implement a comprehensive safety program.

**Discussion:** Employers should ensure that all employees are trained to recognize and avoid hazardous work conditions. A comprehensive safety program should address all aspects of safety related to specific tasks that employees are required to perform. OSHA Standard 1926.21 (b) (2) requires employers to "instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his/her work environment to control or eliminate any hazards or other

exposure to illness or injury." Safety rules, regulations, and procedures should include the recognition and elimination of hazards associated with tasks performed by employees.

## **REFERENCES**

1. Office of the Federal Register: Code of Federal Regulations, Labor, 29 CFR Part 1928.51 (b), U.S. Department of Labor, Occupational Safety and Health Administration, Washington, D.C., April 25, 1975.

George Wahl, M.S.  
Senior Safety Investigator  
MN FACE

David L. Parker, M.D., M.P.H.  
Principal Investigator  
MN FACE