TO: **Director, National Institute for Occupational Safety and Health**

FROM: **California Fatality Assessment and Control Evaluation (FACE) Program**

SUBJECT: **Maintenance Engineer Dies after Falling Approximately 45 Feet from a Catwalk in California**

SUMMARY
California FACE Report #96CA005

A 40-year-old male maintenance engineer (the victim) died after falling approximately 45 feet from a catwalk where he had been attempting to dislodge a piece of chain on a bulk-flow feeder elevator (conveyor). The victim had removed an inspection panel on a section of the conveyor in order to remove a piece of the conveyor chain. The piece of chain link had become lodged during an earlier attempt to repair the conveyor. The victim lost his balance falling backwards off the catwalk and striking a metal bar on his fall to the ground. There had been no recent safety inspection conducted in this area of the facility. There was no guardrail at this location and the victim had not been wearing a safety belt/harness or lanyard at the time of the incident. The CA/FACE investigator concluded that in order to prevent future similar occurrences employers should:

- ensure that fall-protection equipment is provided and utilized by employees whenever work is performed from an elevation where the potential for a fall exists.
- install guardrails in all work areas where a fall hazard exists.
- routinely conduct scheduled and unscheduled worksite safety inspections.

INTRODUCTION

On March 27, 1996, the victim fell approximately 45 feet from a catwalk where he had been attempting to dislodge a piece of chain on the conveyor system for a bulk-flow feeder elevator. The CA/FACE investigator was informed of this incident by a California Division of Occupational Safety and Health (Cal/OSHA) district office on April 2, 1996. The CA/FACE investigator conducted an employer interview and site investigation on April 16, 1996. Photographs of the incident site were also taken at that time. A follow-up interview with the vice president of human resources/safety was conducted on May 25, 1996. The CA/FACE investigator obtained copies of the Cal/OSHA report, the coroner's autopsy report, the employer incident report and the paramedic's report.

The employer in this incident is an animal by-products (rendering) plant that had been in business at the incident site for 114 years. The meal (end product) which is made from animal meat and by-products is used for animal feed and cosmetic purposes. The company employed 64 workers at this site, and also maintained a staff of approximately 1500 workers in 32 plants

worldwide. The company operated this facility on a 24 hour a day basis six days a week. The victim had worked for his employer for seven months.

The company had a safety officer on staff who devoted approximately 50% of his time to safety issues. They also maintained a written Injury & Illness Prevention Program (IIPP). A written section entitled "Fall Arrest Systems", addressed the role of the general manager and safety committee chairman in performing hazard evaluations (walk-throughs) and hazard assessments. Written policy stated that after a written assessment was completed a determination should be made as to the need for providing personal protection equipment (PPE), e.g., safety harness/fall arrest system. Written policy also address the routine maintenance and inspection of PPE and the provision of training reference brochures with the purchase of fall arrest systems. One half day of general safety training was also provided by the company for each new employee. There was no written policy that specifically addressed safety training related to the proper use of fall protection equipment.

INVESTIGATION

On the day of the incident, at approximately 1:45 a.m., the victim and a co-worker had been working near the top of the bulk- flow feeder elevator (meal loading area). The bulk flow feeder elevator is an 80 foot long conveyor system which is used to bring ground meat and animal by-products up to the meal loading area. The finished product is then placed in a funnel/silo where it can be distributed to trucks when they drive to the silo (Exhibit 1).

Workers from the previous day shift had attempted multiple times to correct a chain problem on the conveyor. A maintenance mechanic stated that the plant manager spoke with him and emphasized the importance of getting this problem resolved quickly. The plant manager ordered the dayshift maintenance mechanic to explain the procedure for reinstalling the chain to a maintenance engineer and mechanic from the evening shift.

These two employees (maintenance engineer and mechanic) worked on this problem together until the victim arrived at approximately 10:00 p.m. The victim then joined them in their efforts to try and discover the problem. The workers had taken portable lighting to the work area because there was no overhead lighting in that location. After looking behind an inspection panel located on the second level of the catwalk (Exhibit 2), they discovered that the problem was a piece of the chain link that had become wedged between the elevator and the conveyor chain. The maintenance engineer stated that he explained to the victim what needed to be done and then left to go home.

The two remaining workers (victim and the maintenance mechanic) attempted to attach a cable to the conveyor chain where the chain link had become lodged. The victim had to climb down to a lower platform so that he could more easily access an area on the conveyor and attach the cable in order to dislodge the chain link. This lower platform could only be reached by using a stationary stairway which led to a railing. The victim then had to climb over that railing, climb across a two and a half foot open space and climb over a secondary railing to the metal grated cat walk (see Exhibit 2). There was no alternative direct, unobstructed access to this section of the conveyor. The catwalk was a retrofitted work platform measuring two feet by two feet. There was no guardrail at this location and the victim was not wearing any type of fall protection equipment. The employer stated that it was the company standard operating procedure (SOP) to utilize a safety harness and lanyard when accessing this lower platform. However, this SOP was

not documented in the company safety plan. No recent worksite safety inspection had been conducted by management in the area where the victim was working. Monthly walk-through inspections were conducted in other areas of the plant. In the area where the incident occurred, however, inspections were conducted approximately once a year.

The victim proceeded with his attempt to dislodge the piece of chain link. The co-worker (maintenance mechanic) stated that he heard the victim working with a wrench, and soon the conveyor, which had been turned off, began to move. This movement was the release of mechanical energy in response to the work being conducted at the time. He (co-worker) then secured the conveyor to prevent its movement, and yelled to the victim "OK, it's done". At that point, the co-worker heard a metal clanking noise and assumed that the victim's wrench had fallen out of his hands to the ground below. He (co-worker) looked in the area where the victim had been working but didn't see him. He then looked down and saw the victim lying on the ground. He immediately ran down to where the victim was located and saw that he was bleeding from his mouth, nose, and ears. Another maintenance worker had seen the victim fall and was already enroute to the telephone. Paramedics arrived at 2:12 a.m. and transported the victim to the hospital, where he was pronounced dead at 4:30 a.m.

CAUSE OF DEATH

The Coroner's Autopsy Report stated the cause of death to be blunt injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure that fall protection equipment is provided and utilized by employees whenever work is performed from an elevation where the potential for a fall exists.

Discussion: In this incident, the employer did have a written program entitled "Fall Arrest Systems". Fall protection was also provided for workers. This program did not, however, address the need for any instruction on the use of fall protection equipment. Under Title 8 of the California Code of Regulations (CCRs) section 3380 (c), "The employer shall assure that the employee is instructed and uses protective equipment in accordance with the manufacturer's instructions."

Recommendation #2: Employers should install guardrails in all work areas where a fall hazard exists.

Discussion: In this incident, there was no guardrail on the catwalk. The victim lost his balance while working on the catwalk. If a guardrail had been present, the victim may have been able to stop himself before falling over the edge. Under Title 8 of the California Code of Regulations (CCRs) section 3210 (a): "Guardrails shall be provided on all open sides of unenclosed roof openings, open and glazed side of landings, balconies or porches, platforms, runways, ramps, or working levels more than 30 inches above the ground, or other working areas. Where overhead clearance prohibits installation of a 42-inch guardrail, a lower rail or rails shall be installed. The railing shall be provided with a toeboard where the platform, runway, or ramp is 6 feet or more above places where employees normally work or pass and the lack of a toeboard could create a hazard from falling tools, material, or equipment."

Recommendation #3: Employers should routinely conduct scheduled and unscheduled

worksite safety inspections.
Discussion: The employer should identify all potential hazards at a work site. Job hazard analysis consists of analyzing the sequential steps in routine operations to identify potential hazards, and attempting to develop procedures or other control measures which effectively eliminate or reduce the hazards. Each specific job involves hazards particular to that job or working environment. Therefore, employers should conduct a job site survey, identify all hazards, and implement appropriate control measures prior to starting a job. A job site and/or hazard analysis survey in this instance would have determined that there was an exposed opening and a need for some type of fall protection. Both job hazard analysis and pre-job survey techniques can be effectively used to train workers in hazard identification and appropriate control measures.

References
Barclays Official Code of Regulations, Vol. 9, Title 8, Industrial Relations. South San Francisco, CA, 1990.

Rick Tibben, CSP
FACE Investigator

Robert Harrison, MD, MPH
FACE Project Officer

Janice Westenhouse, MPH
Research Scientist

Marion Gillen, RN, PhD
Research Scientist

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the Public Health Institute and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations of work-related fatalities. The goal of this program, known as the California Fatality Assessment and Control Evaluation (CA/FACE), is to prevent fatal work injuries in the future. CA/FACE aims to achieve this goal by studying the work 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. NIOSH-funded, state-based FACE programs include: Alaska, California, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, Nebraska, New Jersey, New York, Oklahoma, Oregon, Washington, West Virginia, and Wisconsin.

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Additional information regarding the CA/FACE program is available from:

California FACE Program
California Department of Health Services
Occupational Health Branch
850 Marina Bay Parkway, Building P, 3rd Floor
Richmond, CA 94804