TO: Director, National Institute for Occupational Safety and Health

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

SUBJECT: Iron worker foreman dies after falling from a catwalk in California.

SUMMARY
California FACE Report #95CA015

A 63 year-old white, male iron worker foreman (victim) died after falling 43 feet from a catwalk to the concrete floor of a military aircraft hangar while moving some welding cables. The victim was lowering the welding cables to the floor by draping them over the edge of the catwalk. The victim was not wearing any fall protection equipment and was not tied off to the existing catenary line (lifeline). He had climbed under the catenary line to gain access to the edge of the catwalk. His co-worker noticed the victim leaning out too far and attempted to grab him before he fell, but could not reach him. No hazard assessment of the job was performed nor was the victim given any fall prevention training by the company, a sub-contractor. The general contractor did not review the sub-contractor's safety procedures prior to allowing them to begin work. The CA/FACE investigator concluded that, in order to prevent similar future occurrences, employers should:

- Assure employees have and use proper fall protection equipment with which to tie off when working at heights requiring fall protection.
- Provide safe access to heights by use of aerial lifts or other appropriate means when heavy or bulky equipment or materials must be moved.
- Train employees, including periodic refresher training, to be aware of and understand the hazards of the job.
- Perform an initial hazard assessment of the job prior to beginning work.
- Thoroughly review and approve all sub-contractor's safety plans and procedures to assure they meet the requirements of the specific tasks to performed.

INTRODUCTION

On October 24, 1995 at 6:20 a.m., a 63 year-old white male iron worker foreman fell 43 feet from a catwalk and was declared dead at 7:02 a.m. The victim fell face down onto the concrete floor of a military hangar. The CA/FACE investigators were notified of this incident by the Cal/OSHA Bureau of Investigations (BOI) office on October 28, 1995 and responded to the incident location on October 30, 1995 at 2:00 p.m. The site is a military facility and an

aerospace firm leases the building from the military. The CA/FACE investigators met with the health and safety specialist for the aerospace company for whom the work was being performed and the project manager for the general contractor.

The employer, a subcontractor, is a small structural steel fabrication business employing twelve people. The company had been in business for six years and the victim had worked for them for four years. The victim had been on this job site for 14 days. The employer had provided no training for the victim, but assumed he had been trained through his apprenticeship program. The company was not sure if a site survey to assess job hazards had been done prior to work beginning.

INVESTIGATION

After the opening conference, the FACE investigators were driven to the hangar, to examine the scene of the incident. They were accompanied by the aerospace health and safety specialist and the general contractor's project manager. The CA/FACE investigators had to leave behind all electronic gear and cameras due to the secure nature of the job site.

The hangar is a large open building, approximately 450 feet long with an annex on the east end and three very large bay doors along the south side. The building is formed of structural steel and is metal clad. A concrete floor runs the length of the building, although on the day of the investigation, part of the floor near the east end was torn out and the ground was being excavated.

A week and a half prior to this incident, the two employees of the subcontractor who were involved in the incident were called out to work on the catwalk at the East Annex. They had come onto the job site with no fall protection equipment. The general contractor loaned them each a harness and a lanyard and trained them in their use. This training was not documented. The subcontractor employees were also instructed to never climb without proper fall protection while on this job site. They were also told by the general contractor to bring their own fall protection equipment on subsequent visits.

The job on the day of the incident involved the installation of one very large bay door (center high bay) in approximately the middle of the south side of the building. The job was to have begun the morning of October 24, 1995.

At the start of the each workday, it was the responsibility of one of the general contractor's laborers to turn on all of the lights in the hangar building. The lighting consists of individual, overhead mercury vapor lighting fixtures. The laborer turned on these lights at approximately 6:00 a.m. Prior to the start of the job, the two employees of the subcontractor came onto the job site. They accessed the "eyebrow," a type of catwalk, by climbing the shift ladder located on the third floor mezzanine at the extreme west end of the hangar. The shift ladder was located approximately 250 feet from the incident site.

The eyebrow is of I-beam construction and varies from six feet to eight feet wide. It abuts the south wall just below the ceiling. There is no opening between the wall and the eyebrow. It is decked with metal and topped with Tectum. Tectum is a type of fiber board insulation which has a very high coefficient of friction. There is a catenary line or lifeline running the entire length of the eyebrow at about waist height. The two subcontractor employees walked 250 feet

along the eyebrow to the place from which the decedent fell. They were retrieving some welding cables and lowering them to the ground. The welding cables were left on the catwalk by other employees of the subcontractor during prior work.

The decedent was lowering the welding cables over the edge of the catwalk to the floor. According to his co-worker, the decedent moved under the catenary line, which is strung approximately three feet behind the edge of the eyebrow, in order to maneuver the welding cables. The decedent had to drape the cables over and around the framework of the catwalk consisting of a 12-inch wide I-beam, and crane rails which were about eight inches wide, and some diagonal bracing which is part of the structure of the building.

The co-worker noticed that the decedent was leaning too far out. He was about five feet away and reached for him but was not able to grab him. The decedent fell from the eyebrow to the concrete floor 43 feet below. His co-worker ran along the catwalk to the shift ladder, climbed down and ran to where the decedent had fallen. He found the decedent had no pulse and was not breathing. The impact area was five feet forward of the leading edge of the catwalk. The co-worker ran to the Security Escort Trailer for the construction site. It is located on the southeast end of the hangar building. He was upset and was saying "Man in the hole" to the security guards.

Two security guards proceeded to the southwest gate to request the escort there to open the gate for emergency services personnel and then went to find the contractor in trouble. Coming upon the decedent, it was then that they realized that he had actually fallen. He was described as not moving with his arms and legs in weird positions. He was further described as looking almost flat. One security guard asked the co-worker, who had returned to the site, if the decedent had a pulse. The co-worker said he did not know. As the security guard went to walk around the man to check for a pulse, the co-worker stopped her and said that she should not see the decedent.

At 6:24 a.m., the Physical Protection Control Center was notified that a contractor had fallen into a trench and that a 10-33 (medical emergency) was being declared. All site fire personnel were notified including the military fire department. The first aerospace fire unit arrived at 6:29 a.m. and found the decedent face down and cyanotic. An assessment revealed that there was no respiration or pulse and the decedent had major head and facial trauma. The decedent was turned onto his back and CPR was initiated.

As treatment continued, the decedent was placed on a backboard and taken to the military ambulance as the Los Angeles County paramedics arrived. The decedent's treatment was turned over to the paramedics. He was transported in the Air Force ambulance, with paramedics accompanying, to a local community hospital. The decedent was declared dead at 7:02 a.m.

Subsequent investigation by site personnel indicated that there was a forklift with an attached manlift platform approximately five feet from the impact site. The subcontractor employees had used a boom lift to access their work on previous occasions. They did not use this forklift to access the catwalk at the time of the incident because they had not acquired authority to use it. A survey of the eyebrow area at the point of the fall turned up the decedent's glasses. They were open as if they might have fallen out of his pocket. It was also noted that the

dust on the catwalk frame, the crane rails and the diagonal bracing had not been disturbed during the work or the fall.

CAUSE OF DEATH

The coroner's autopsy report stated the cause of death to be blunt injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Assure employees have and use proper fall protection equipment with which to tie off when working at heights requiring fall protection.

Discussion: Neither the decedent or his co-worker had a safety belt or lanyard. They had previously worked on the catwalk at this job in a different area of the building. At that time they also did not have personal fall protection. The contractor loaned them belts and lanyards, trained them in their use, and insisted that they always bring and use personal fall protection when working at heights or on the catwalk. The catwalk had a proper catenary line to which he could have tied off. Had the decedent used fall protection and tied off, this fatality may not have happened. Section 1670(a) of Title 8 of the California Code of Regulations states: "Approved safety belts and lanyards shall be worn by those employees whose work exposes them to falling in excess of 7 1/2 feet from the perimeter of a structure, through shaftways and openings, sloped roof surfaces steeper then 7:12, or other sloped surfaces steeper than 40 degrees not otherwise adequately protected under the provisions of these Orders."

Recommendation #2: Provide safe access to heights by use of aerial lifts or other appropriate means when heavy or bulky equipment or materials must be moved.

Discussion: In the construction industry, heavy equipment or materials are normally raised to the working height by means of forklifts, aerial lifts or other powered means. Heavier objects are also retrieved and lowered to the ground in the same manner. In this case, the decedent attempted to lift heavy welding cables and drape them over the edge of the catwalk so he could lower them to the floor 43 feet below. In so doing, he lost his balance and fell to his death. If he had used mechanized equipment with a platform and been tied off, he could have safely moved the welding cables off the catwalk and onto the platform. The platform could then have been lowered to ground level.

Recommendation #3: Train employees, including periodic refresher training, to be aware of and understand the hazards of the job.

Discussion: The decedent did not receive any training from the company for whom he worked. The company stated that he may have had training in his apprenticeship program prior to being hired. The contractor also did not provide any training other than undocumented training regarding the use of personal fall protection equipment which they had loaned to the decedent. Section 1510(a) of Title 8 of the California Code of Regulations states: "When workers are first employed they shall be given instructions regarding the hazards and safety precautions applicable to the type of work in question and directed to read the Code of Safe Practices." Additionally, Section 1510(c) states: "Where employees are subject to known job site hazards,

such as ... they shall be instructed in the recognition of the hazard, in the procedures for protecting themselves from injury, and in the first aid procedures in the event of injury." Had the decedent received specific training concerning proper types of belts and lanyards, tying off which is consistent with the standards, and that it was mandatory for him to comply, this incident most likely would not have occurred.

Recommendation #4: Perform an initial hazard assessment of the job prior to beginning work.

Discussion: No initial hazard assessment of the worksite was performed. Normally, the contractor would go over the hazards of the site with the subcontractor and ask the subcontractor for a site specific addendum to their Injury and Illness Prevention Program (IIPP). The subcontractor would then instruct their employees in the hazards of the job. None of this was done. Since the subcontractor's employees began working before normal starting time, it was their responsibility to do the hazard assessment. Under Title 8 of the California Code of Regulations, Section 1511(b): "Prior to the presence of its employees, the employer shall make a thorough survey of the conditions of the site to determine, so far as practicable, the predictable hazards to employees and the kind and extent of safeguards necessary to prosecute the work in a safe manner in accordance with the relevant parts of Plate A-2-a and b of the Appendix." Pre-planning projects for fall protection must address a complete system. By setting priorities, fall exposure protection comes into perspective, allowing the hazards to be evaluated and proper protection selected**.** Had the employer done this and noted the necessity for proper personal fall protection, the incident most likely would not have occurred.

Recommendation #5: Contractors should thoroughly review and approve all subcontractor's safety plans and procedures to assure they meet the requirements of regulations regarding the specific tasks to be performed.

Discussion: The subcontractor (employer) had not presented an IIPP, any record of employee training or their code of safe practices to the general contractor. Therefore, the general contractor could only assume that the subcontractor's employees were job qualified and safe employees. Section 3202 of Title 8 of the California Code of Regulations states: "Include a system for ensuring that employees comply with safe and healthy work practices. Substantial compliance with this provision includes recognition of employees who follow safe and healthful work practices, training and retraining programs, disciplinary actions, or any other such means that ensures employee compliance with safe and healthful work practices." If the contractor and/or subcontractor had ensured that the decedent worked according to pertinent safety regulations, this incident may not have happened.

References

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

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June 10, 1996

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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
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Richmond, CA 94804