

Electrician Apprentice Dies Following a 33-foot Fall Through a Roof--South Carolina

SUMMARY

A 24-year-old male electrician apprentice (the victim) died of injuries received after falling 33 feet through a roof. The victim was part of a five-man crew that was installing conduit and wiring to the top of a dust-collecting silo in the granule plant of a roofing products manufacturer. The victim had just completed pulling electrical wire through a conduit while standing on a steel platform attached to the side of the silo. The platform was equipped with a standard protective railing which consisted of a top rail, mid rail, and toe board. The granule plant roof was directly below the platform, approximately 34 inches from the mid rail. The foreman and another worker were standing on the granule plant roof about 10 feet from the edge of the platform, waiting for the victim to finish his task and break for lunch. His back toward the other workers, the victim climbed over the top rail, and with his feet resting on the mid rail, jumped to the granule plant roof. He broke through the roof of corrugated transite panels and fell 33 feet to the concrete floor. An employee working in the granule plant saw the victim fall and strike the concrete. The employee and the workers from the roof ran to aid the victim, who suffered a severe head injury. The victim was unconscious and was not breathing. Cardiopulmonary resuscitation (CPR) was started and the Emergency Medical Service (EMS) was called. The EMS arrived in less than 15 minutes and pronounced the victim dead at 11:50 a.m. NIOSH investigators concluded that, to prevent similar occurrences, employers should:

- *evaluate their current safety program and incorporate specific training procedures emphasizing the importance of recognizing and controlling hazards in the workplace. These procedures should include, but not be limited to, conducting hazard evaluations before initiating work at a job site and implementing appropriate controls*
- *designate a competent person to conduct scheduled and unscheduled site visits to evaluate field compliance with company safety rules and procedures.*

In addition, plant/facility owners should:

- *identify areas that may be hazardous to all personnel, including contractors, and restrict or prohibit the use of or access to these areas.*

INTRODUCTION

On June 25, 1993, a 24-year-old male electrician apprentice (the victim) died after falling 33 feet through a roof. On June 25, 1993, officials of the South Carolina Occupational Safety and Health Administration (SCOSHA) notified the Division of Safety Research (DSR) of this fatality and requested technical assistance. On July 28, 1993, a safety specialist from DSR investigated the incident and reviewed the circumstances with a company representative, a witness to the incident, the plant manager, and the SCOSHA compliance officer assigned to the case. Photographs of the incident site were taken, and the medical examiner and police reports were obtained.

The employer in this incident was an electrical contractor that had been in operation for 23 years and employed 27 workers, 7 of whom were electrician apprentices. The employer had a written safety policy and a general safety program which included a hazardous communication program, pre-hiring and random drug testing, and a disciplinary program. Company management personnel were

responsible for the enforcement of the safety program, and the employer provided on-the-job training. Additionally, the roofing manufacturer provided all contractors with a booklet containing safety information and instructions which were to be followed when contractors worked at the plant. This booklet included information on establishment of work boundaries and access to worksites by contract personnel. The victim worked for the company for 2 months as an electrician apprentice, but had approximately 3 year's experience working in this occupation. This was the first fatality the company had experienced.

INVESTIGATION

The employer had been contracted by a roofing products manufacturer to install electrical conduit, wiring, and related components at the dust-collecting silo located in the granule plant. The silo was situated adjacent to and partially above the roof of the 29-year-old granule plant. The plant walls and roof were constructed of corrugated transite panels, a fire-proofing material used in walls and roofs and for lining ovens. The panels were composed of asbestos and cement molded under high pressure, and they had a load rating of 200 pounds per square foot. The panels were set in place on steel girders approximately 30-inches apart. Work on the dust-collecting silo had been in progress for 3 days before the incident.

On the day of the incident, the victim and four co-workers (one foreman, and three other electrician apprentices), arrived at the plant and started work at 7 a.m. The workers had spent the morning installing the necessary conduit and pulling electrical wire through it. At approximately 11:35 a.m., the workers were getting ready to break for lunch. The victim had just completed pulling electrical wire through a conduit while standing on a steel platform attached to the side of the silo. The platform was equipped with a standard protective steel railing which consisted of a top rail, mid rail, and toe board. The granule plant roof was directly below the platform, approximately 34 inches from the mid rail ([Figure](#)). The foreman and another worker were standing on the granule plant roof about 10 feet from the edge of the platform, waiting for the victim to finish his task and go to lunch. Plant personnel had seen the workers using the roof as a route of access to the ladder leading to the ground. His back toward the other workers, the victim climbed over the top rail, and with his feet resting on the mid rail, jumped to the granule plant roof. The victim, who weighed 235 pounds, broke through the corrugated transite panels and fell to the concrete floor 33 feet below. An employee working in the granule plant saw the victim fall and strike the concrete floor. The employee and the workers from the roof ran to aid the victim, who suffered a severe head injury. The victim was unconscious and was not breathing. Cardio Pulmonary Resuscitation (CPR) was started and the EMS was called. The Emergency Medical Squad (EMS) arrived in less than 15 minutes and pronounced the victim dead at 11:50 a.m. The medical examiner arrived on the scene shortly thereafter and had the victim transported to the morgue at the local hospital.

CAUSE OF DEATH

The medical examiner reported the cause of death as head trauma.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should evaluate their current safety program and incorporate specific training procedures emphasizing the importance of recognizing and controlling hazards in the workplace. These procedures should include, but not be limited to, conducting hazard

evaluations before initiating work at a job site, and implementing appropriate controls.

Discussion: The existence of a safety program is only the first step in obtaining a viable safety record. In addition to enforcement, safety programs should be evaluated and training procedures incorporated which emphasize the importance of recognizing and controlling hazards in the workplace, following established safe work procedures, and wearing appropriate personal protective equipment. The hazard of walking or jumping on roofing panels constructed of transite apparently was not recognized by the workers. Additionally, before starting any job at a new work site, the employer or employer's representative should identify, by observation and by collaboration with the work site owner, any potential or existing hazards. These hazards should be reviewed with the work crew, and methods to control the hazards and to perform the work safely should be discussed. These discussions should include information on hazards in the immediate work area as well as information on the activities of other work crews on the site that could create additional hazards. In this instance, personnel could have been instructed not to access the roof area.

Recommendation #2: Employers should designate a competent person to conduct scheduled and unscheduled site visits to evaluate field compliance with company safety rules and procedures.

Discussion: Employers should designate a competent person to conduct scheduled and unscheduled safety inspections of work sites to help ensure that employees are performing their assigned tasks according to established company safety rules and procedures. To be effective, a safety program must be enforced at the worksite. Any violations of safety rules should be corrected immediately. Such inspections also demonstrate that the employer is committed to the company safety program and to the prevention of occupational injury.

Recommendation #3: Plant/facility owners should identify areas that may be hazardous to all personnel, including contractors, and restrict or prohibit the use of or access to these areas.

Discussion: Owners of plants/facilities where outside contractors perform jobs should work with contractors to identify areas that may be hazardous. After these areas have been identified, signs and/or barriers, along with verbal communication with the contractors, should be established. Additionally, if work must be performed in one of the identified hazardous areas, appropriate precautions and procedures should be implemented and enforced. [Note: Since this incident, the roofing manufacturer has instituted a safety procedure prohibiting any access to the roofs without the use of a safety belt, lanyard, and lifeline.]

Not to scale

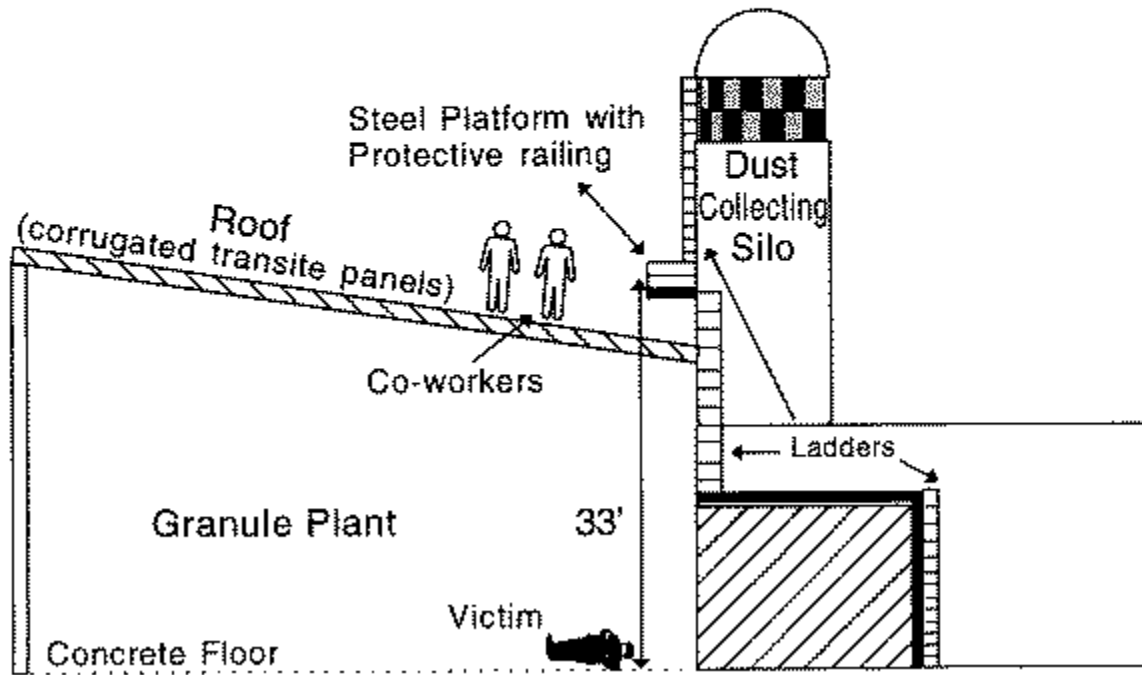


Figure.