

# **F.A.C.E. INVESTIGATION REPORT**

## Fatality Assessment and Control Evaluation Project

FACE #97-NJ-112-01  
Roofer Dies After Falling 41 Feet  
Through an Airport Hangar Roof



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**TO:** Division of Safety Research  
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**FROM:** Fatality Assessment and Control Evaluation (FACE) Project  
New Jersey Department of Health (NJDHSS)

**SUBJECT:** FACE Investigation #97-NJ-112-01  
Roofer Dies After Falling 41 Feet Through an Airport Hangar Roof

**DATE:** June 22, 1998

### **SUMMARY**

On November 13, 1997, a 41-year-old apprentice roofer was critically injured after falling through the roof of an aircraft hangar. The victim and a crew of 14 roofers were engaged in removing the old roofing membrane and insulation from a county airport hangar. The hangar was a large, wood-truss constructed building covered with wood planking. Most of the workers were not wearing safety harnesses on the roof, which was relatively flat at the top. Shortly after starting work at 7:00 a.m., the victim was bending over to pick up a piece of scrap when he broke through a rotted section of the wood roof. He went straight through the planking, falling 41 feet to the concrete floor below. NJ FACE recommends the following safety guidelines to prevent similar incidents in the future:

- Employers must ensure that employees use fall protection whenever there is a risk of falling more than six feet.
- Employers should conduct a job hazard analysis of all work activities with the participation of the workers.
- Employers should become familiar with available resources on safety standards and safe work practices.

## **INTRODUCTION**

On November 25, 1997, an OSHA compliance officer notified FACE personnel of a death due to a work-related fatal fall. The victim, a roofer who fell on November 13, had been hospitalized since the incident and died on November 24, 1997. A FACE investigator accompanied the OSHA compliance officer on a visit to the incident site on that same day to interview the foreman and photograph the site. Additional information was obtained from the OSHA compliance officer, the police report, and the medical examiner's report.

The employer was small construction company that specialized in roofing and employed about 50 workers, 14 of whom were on site at the time of the incident. Employees were hired through the local union hall that provided training to its members. Although the company did not have a formal written safety program, they conducted toolbox meetings at the jobsites. The foreman was responsible for safety at the site. The victim was a 41-year-old apprentice roofer who had worked for the company for two years. He had been hired from the union hall and was halfway through his four-year apprentice program. He was described as a large man, weighing close to 300 pounds.

## **INVESTIGATION**

The incident site was the roof of a hangar at a medium sized county airport near an urban area. Classified as a "reliever" airport, the airport handled up to 250,000 takeoffs and landings per year that would otherwise be handled at the nearby international airport. On the airport grounds was a 130 by 120-foot wooden airplane hangar constructed around 1939. The hangar was of wood-truss, barrel-roof construction, giving the building the general appearance of a barrel lying on its side. Covering the building was a waterproof roofing membrane and insulation installed over tongue-and-groove wood boards. The underside of the roof consisted of the exposed wood trusses and painted boards that could be seen from the concrete floor of the hangar.

The hangar was owned by the airport and leased to a company that operated a flight school, air charter, and fuel service. In 1993, the hangar had been cosmetically renovated to replace the siding, windows, and wiring. Over time, the tenant complained of leaks in the hangar roof, which could be seen as water stains on the painted roofing boards. The airport hired an architectural firm who inspected the hangar and determined that the roof's waterproof membrane had to be replaced and recommended inspecting the wood as the old roofing was removed. The roofing company was hired to replace the roofing membrane and any damaged boards they found. Work on the roof started on November 12, 1997 and was expected to take two weeks to complete.

The incident occurred on the second day of the job. The foreman arrived on site at 6:00 a.m. along with the first of the 14 roofers who would work that day. It was a cold morning, with frost seen on the roof when they first arrived. As the remaining workers arrived at 7:00 a.m., the crew started by hauling tools up to the roof. The job was directed by the roofing company foreman, an eight-year employee with four years of experience as foreman. He instructed the workers to stay close to the center of the roof where the pitch was relatively flat. Several workers began to cut away sections of the roof with a gasoline powered radial saw as the victim manually tore up the cut sections and loaded the debris onto wheelbarrows. The debris was dumped into a disposal chute near the center edge of the roof. Only two of the workers reportedly used safety harnesses, which were attached to ropes held by other employees to prevent the employees from falling.

At 7:45 a.m., the victim was collecting roofing debris at the top of the roof. He was standing on the bare wooden boards to pick up a piece of scrap when the section of rotted boards broke under his feet. A co-worker who was standing beside him reported hearing a click and jumping away as the victim tried to extend his elbows to stop the fall. He fell 41 feet to the hangar floor below, landing feet first on the concrete floor. His co-workers immediately came to his aid and called 911. The police found him conscious and complaining of pain in his hips and abdomen, and he was med-evaced to the area trauma center where he was admitted. Despite treatment and surgery, his condition deteriorated over the next ten days until he died of his injuries on November 24, 1997.

### **CAUSE OF DEATH**

The county medical examiner determined the cause of death to be from “multiple blunt force injuries.”

### **RECOMMENDATIONS & DISCUSSIONS**

**Recommendation #1: Employers must ensure that employees use fall protection whenever there is a risk of falling more than six feet.**

Discussion: Most of the employees on the roof did not have any type of fall protection, while those that did were using it improperly. To prevent falls, the FACE program recommends that all employees working on pitched or damaged roofs use an appropriate fall protection system. The most common type is the personnel fall arrest system, which consists of a harness and lifeline tied into an anchorage point. This system permits the use of a self-retracting cable reel for lifelines that allows for greater worker mobility. Other methods and additional information are included in the attached OSHA publication, *Fall Protection in Construction*.

**Recommendation #2: Employers should conduct a job hazard analysis of all work activities with the participation of the workers.**

Discussion: In this incident, the roofing company was unaware of the roof’s load capacity or the weight of the people, equipment, and materials on the roof. They were aware of the weakened boards but not of their specific locations. To prevent future incidents, FACE recommends that employers conduct a thorough job hazard analysis of the work site before starting work. This should be done by examining the worksite for safety hazards such as falls, loose debris, electrical wiring, weather conditions, and other common hazards the workers may encounter. After identifying the hazards, the workers are instructed on how to correct or avoid them. Further information is included in the attached OSHA publication, *Job Hazard Analysis*.

**Recommendation #3: Employers should become familiar with available resources on safety standards and safe work practices.**

Discussion: It is extremely important that contractors obtain accurate information on working safely and following all OSHA standards. The following sources of information may be helpful:

**U.S. Department of Labor, OSHA**

On request, OSHA will provide information on safety and health standards. OSHA has several offices in New Jersey that cover the following areas:

- Hunterdon, Middlesex, Somerset, Union, and Warren counties.....(732) 750-4737
- Essex, Hudson, Morris, and Sussex counties.....(973) 263-1003
- Bergen and Passaic counties.....(201) 288-1700
- Atlantic, Burlington, Cape May, Camden, Cumberland, Gloucester,  
Mercer, Monmouth, Ocean, and Salem counties.....(609) 757-5181

**NJ Public Employees Occupational Safety and Health (PEOSH) Program**

The PEOSH act covers all NJ state, county, and municipal employees. The act is administered by two departments; the NJ Department of Labor (NJDOL) which investigates safety hazards, and the NJ Department of Health and Senior Services (NJDHSS) which investigates health hazards. Their telephone numbers are:

- NJDOL, Office of Public Employees Safety .....(609) 633-3896
- NJDHSS, PEOSH Program..... (609) 984-1863

### **NJDOL Occupational Safety and Health On-Site Consultative Program**

Located in the NJ Department of Labor, this program provides free advice to private businesses on improving safety and health in the workplace and complying with OSHA standards. For information regarding a safety consultation, call (609) 292-0404, for a health consultation call (609) 984-0785. Requests may also be faxed to (609) 292-4409.

### **New Jersey State Safety Council**

The NJ Safety Council provides a variety of courses on work-related safety. There is a charge for the seminars. Their address and telephone number is: NJ State Safety Council, 6 Commerce Drive, Cranford, NJ 07016. Telephone (908) 272-7712

### **Internet Resources**

Information and publications on safety and health standards can be easily obtained over the internet. Some useful sites include:

[www.osha.gov](http://www.osha.gov) -The US Department of Labor OSHA website.

[www.state.nj.us/health/eoh/peoshweb/peoshome.htm](http://www.state.nj.us/health/eoh/peoshweb/peoshome.htm) -The NJDHSS PEOSH website.

[www.dol.gov/elaws](http://www.dol.gov/elaws) -USDOL Employment Laws Assistance for Workers and Small Businesses.

### **ATTACHMENTS**

*Fall Protection in Construction.* OSHA Publication 3146, US Department of Labor, OSHA Publications Office, Washington DC, (202)219-4667. 1995.

*Job Hazard Analysis.* OSHA 3071, US Department of Labor, Occupational Safety and Health Administration, Washington DC. 1988.

## **DISTRIBUTION LIST**

### Immediate Distribution

NIOSH

Employer

Incident Site Owner

Labor Union(s)

NJ State Medical Examiner

County Medical Examiner

Local Health Officer

NJDHSS Census of Fatal Occupational Injuries (CFOI) Project

### General Distribution

USDOL-OSHA New Jersey Area Offices (4)

NJDOL Office of Public Employees Safety

NJDHSS Public Employees OSHA

NJDOL OSHA Consultative Service

NJ State Safety Council

NJ Institute of Technology

University of Medicine & Dentistry of NJ

Rutgers University

Stevens Institute of Technology

College of NJ

NJ Shade Tree Federation

NJ Utilities Association

NJ School Boards Association

Public Service Electric and Gas Company

Liberty Mutual Insurance Company Research Center

Private Consultants (4)

Private Companies (10)