

# **A maintenance clean-up worker, at a trucking company freight dock terminal in Texas, died when he fell through a skylight on a roof.**

**Investigation # 98TX13301**

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## **SUMMARY**

A 48 year-old, male maintenance clean-up worker (the victim) died when he fell through a roof skylight. The victim and two co-workers were replacing light bulbs in outside lights mounted on poles attached to the building. They accessed the lights by standing on a ladder placed on top of a semi-trailer positioned next to the building. After replacing the lights on one side of the building, the victim and a co-worker walked across the roof to the other side. While waiting for the trailer to be repositioned, the victim decided to walk back across the roof to tell another worker they needed more lights bulbs. As he walked across the roof, he stepped on a skylight and fell sixteen feet striking his head on a concrete floor.

The TX FACE investigator concluded that to reduce the likelihood of similar occurrences, employers should:

- \* ensure employees are protected from falling through roof or floor holes (including skylights) to lower levels by utilizing fall arrest systems, covers, or guardrail systems around holes.*
- \* incorporate a job safety analysis (JSA) in the decision process when the task to be completed is unusual or not part of normal operations.*
- \* ensure that workers are trained to recognize the dangers of stepping on skylights.*
- \* use an elevated platform when attempting this particular task.*
- \* develop procedures that incorporate the use of an approved platform when raising/lowering workers with a forklift.*

## **INTRODUCTION**

On January 28, 1998 a 48 year-old, male maintenance clean-up worker died when he fell through a skylight on a roof. The TX FACE program officer was made aware of the incident by the Area OSHA office on April 21, 1998. On April 30, 1998, the TX FACE program officer visited the job site, and interviewed the safety manager, and the two co-workers. Photographs and measurements were taken at the site and an autopsy report and fire report were obtained.

The employer was a trucking company that specialized in less than truck loads (LTL). There were approximately 50 employees working for the company. The company has been in business for eleven years. The victim had worked for the company as a maintenance clean-up worker for one year. At the time of the incident there were six employees at the site.

The employer's safety program is managed by a designated safety manager. A written safety program is not in place, however, and there are no written safe work practices for the specific task of changing the exterior lights. The employer does incorporate training materials and administers tests for certain specific tasks.

New hire training is conducted by the employer. Inexperienced employees are assigned to an experienced employee (leadman) for a period of two weeks. Specific task training includes: training on forklifts and hazardous materials (HAZMAT). The employer also incorporates refresher training on forklift operations and HAZMAT. Training is conducted in the classroom and on the job (OJT).

The employer does conduct drug screening and pre-employment physicals when hiring new employees.

## **INVESTIGATION**

The roof they were standing on was a low peak roof of sheet metal panels on steel I-beams. Skylights ran down each side of the roof in equal spacings. The skylights were covered with green fiberglass panels mounted flush with the roof.

A week before the incident, the bulb in one fixture had been changed out by backing a semi-trailer up to the loading dock, placing two plywood sheets on top of the semi-trailer, and then positioning a ladder on top of the plywood. The employer determined that this method was acceptable for servicing other fixtures.

On the day of the incident, a semi-trailer was backed up to the dock. A forklift located inside the terminal was used to lift the victim and a coworker high enough for them to climb onto the top of the semi-trailer. A pallet had been placed on the forks of the forklift for the workers to stand on while being lifted. An opening of less than two feet between the top of the trailer and the roof over the dock allowed them access to the top of the semi-trailer. They crawled through the opening onto the semi-trailer and then climbed up the ladder to the light fixture. After replacing the lights, they walked across to the other side of the roof to wait for the trailer to be repositioned.

As the victim and co-worker waited on the roof, they realized they would need more lights. The victim decided to walk back to the other side to let other workers know more lights were needed. As he walked across the roof, he stepped on a skylight and fell sixteen feet to the concrete floor.

A worker inside the terminal saw the victim fall through the skylight and strike the floor. He rushed over to the victim and observed the victim still breathing. He directed another worker to notify the local EMS. He then went back to the office to notify management and to call EMS a

second time. EMS was dispatched at 12:42 and arrived at 12:46. The victim was transported and arrived at the local hospital at 12:56. The victim died the following day.

## **CAUSE OF DEATH**

The autopsy report stated the victim died as the result of craniocerebral trauma.

## **RECOMMENDATIONS/DISCUSSION**

***Recommendation #1 - Employers should ensure employees are protected from falling through roof or floor holes (including skylights) to lower levels by utilizing fall arrest systems, covers, or guardrail systems around holes.***

Discussion: Workers must be protected against falls before they begin any operation that includes the potential for serious falls. Skylights and other openings must have railings or screens installed before work begins and must remain in place until work is completed. When using covers for holes in floors, roofs and other walking/working surfaces they shall be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time. All covers should be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees. If this had been done, the injury may have been prevented.

***Recommendation #2: Employers should incorporate a job safety analysis (JSA) in the decision process when the task to be completed is unusual or not part of normal operations.***

Discussion: A JSA forces those conducting the analysis to view each operation as part of a system. In so doing, each step in the operation is assessed while consideration is paid to the relationship between steps and the interaction between workers and equipment, materials, the environment, and other workers. Other benefits include: identifying hazardous conditions and potential accidents; providing information with which effective control measures can be established; determining the level of knowledge and skill as well as the physical requirements that workers need to execute specific tasks; and discovering and eliminating unsafe procedures, techniques, motions, positions and actions. A JSA may have identified:

- unguarded skylights
- unstable ladder against light pole
- pallet on fork truck for work platform
- workers apparent lack of knowledge about skylights

***Recommendation #3 - Employers should ensure that workers are trained to recognize the dangers of stepping on skylights.***

Discussion: One aspect of an employers training program regarding fall hazards is to train each worker in the nature of fall hazards in the work area. Specifically, employers should explain that many workers have died from falls through skylight or roof openings. Workers should be aware of all skylights and roof openings in their work area. They should be instructed:

- not to sit or step on skylights because they may not support their weight.
- use fall protection for any work that might result in falls.
- make sure that all skylights and roof openings are appropriately guarded before work begins.
- use nets, catch platforms, or fixed covers if guardrails, screens, protective grillwork, and safety belts are not practical.

Finally, instruct them to read any safety decals affixed to skylights. One method to alert workers of the dangers of stepping on skylights is to affix conspicuous decals to each skylight, warning individuals against sitting or stepping on them.

***Recommendation #4 - Employers should use an elevated platform when attempting this particular task.***

Discussion: The lights are approximately 25-30 feet in the air and are mounted on steel pipes. The pipes were located on the edge of the building. If a ladder were used, the top rung of the ladder would rest on the pipe and therefore could very easily turn to either side. Also, the steel pipes were not of sufficient diameter to support a person's weight or that of a ladder placed against them. A safe method to reach the light fixture would be one that is self-supporting, such as an elevated platform or man lift.

***Recommendation #5 - Employers should develop procedures that incorporate the use of an approved platform when raising/lowering workers with a forklift.***

Discussion: An acceptable practice for carrying/lifting workers with a forklift is using an approved platform securely seated on the forks, fastened to the vertical face, and provided with handrails and toe boards. Handrails will provide a safe enclosure for workers to perform maintenance activities. Toe boards help prevent objects from being accidentally kicked from the platform and striking someone. In addition, a means to cut off power to the forklift must be available to those who are in the platform.

## **REFERENCES**

NIOSH [1989]. NIOSH Alert: preventing worker deaths and injuries from falls through skylights and roof openings. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No.90-100.

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