



## The National Institute for Occupational Safety and Health (NIOSH)



# Building Renovation Contractor Electrocuted When Scaffold Contacted 8,000 Volt Overhead Power Line

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MN FACE Investigation 95MN04201

## SUMMARY

A 23-year-old male building renovation contractor (victim) was electrocuted when a steel scaffold contacted an overhead power line. The victim and a coworker were tuck pointing the exterior of a two-story brick building. They had completed the removal of loose mortar from a portion of the building's west wall. The tubular steel scaffold consisted of five individual sections stacked on top of each other. The victim and the coworker rolled the scaffold on casters along the side of a building. Parallel to the side of the building was an 8,000 volt overhead power line. The scaffold was moved to the north end of the building wall and was being moved around a corner and up onto an asphalt parking area. The scaffold had to be raised approximately six inches from the ground up onto the asphalt. The victim walked backward and pulled on the scaffold while the coworker pushed it across the ground. When they reached the corner of the building, the scaffold was turned and positioned at an angle with respect to the building. The victim lifted the leading edge of the scaffold to get the caster closest to the asphalt onto the asphalt. When he lifted the front of the scaffold, the scaffold corner nearest the power line contacted the line. A path to ground was completed through the victim and he was electrocuted.

Two employees in the building heard a loud noise when the power line burst and saw the victim on the ground immediately after the incident occurred. They placed a call to emergency medical personnel and then ran outside and began cardiopulmonary resuscitation. Emergency medical personnel arrived within several minutes and transported the victim to a local hospital where he died about one hour later. MN FACE investigators concluded that to reduce the likelihood of similar occurrences, employers should:

- contact the local electrical utility to assist or provide guidance whenever work is performed in the vicinity of overhead power lines;
- provide extendable aerial platforms instead of fixed scaffolding whenever possible; and
- ensure employees follow safe work practices whenever working near overhead power lines or with materials which may contact overhead power lines.

## INTRODUCTION

On July 17, 1995, MN FACE investigators were notified of a work-related electrocution that occurred on July 12, 1995. A site investigation was conducted by a MN FACE investigator on July 25, 1995. A copy of the county coroner's summary report containing releasable information, was requested and obtained. During the site investigation, information concerning the incident was provided by the building supervisor where the incident occurred.

## INVESTIGATION

The victim and a coworker moved a steel pipe scaffold along a 24 foot long section of the west side of a building (See [Figure 1](#)). The scaffold was 25 feet tall and had a 5 foot by 7 foot footprint. It consisted of five sections that were each 5 feet tall. Each corner of the scaffold was mounted on an adjustable screw jack and caster. The casters were 7 inches in diameter and allowed the scaffold to be moved by rolling it on the ground. The screw jacks allowed each corner of the scaffold to be independently adjusted to level the scaffold on uneven surfaces. The screw jacks/casters, when adjusted to their lowest position, held the bottom of the corner scaffold pipes 17 inches above the ground.

The ground along the west side of the building sloped away from the building. The slope was measured as approximately 2-2.5 inches of drop over 8 feet of horizontal distance. The outer screw jacks (the two furthest from the building) were extended to lean the scaffold slightly toward the building as it was used and as it was moved.

Parallel to the west side of the building was an 8,000 volt overhead power line. The power line was approximately 9 feet – 4 inches away from the side of the building. The line was approximately 28 feet high at a line pole that was 25 feet north of the point where the scaffold contacted the line. The line sagged approximately 18 to 24 inches at the point where the scaffold contacted it. At the time of the site visit, the old power line that broke when the incident occurred had been replaced with a new line. The new line was covered with insulating blankets along the west side of the building.

The scaffold was moved to the north end of the 24-foot wall and was being moved around a corner and up onto an asphalt parking area along the north side of the building. When the workers reached the northwest corner of the building wall, the scaffold was positioned at an angle with respect to the building. The caster nearest the building (northeast corner of scaffold) was approximately 18 inches from the building, along a line extending from the corner of the building and forming a 30-degree angle with the edge of the asphalt. A second caster (southeast corner of scaffold) was at a location approximately 4 feet 3 inches south and 4 feet 1 inch west of the building's northwest corner. The caster on the northwest corner of the scaffold had rolled into several inches of sand along the edge of a pile of sand. The scaffold had to be raised approximately 6.5 to 7 inches from the ground up onto the asphalt.

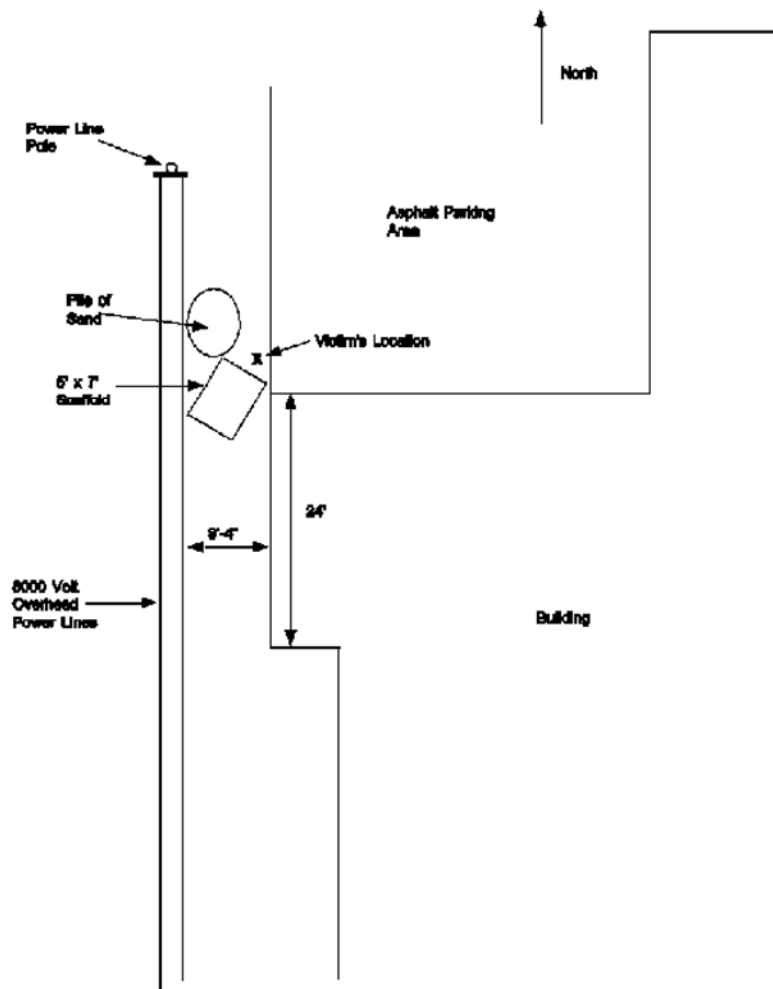


Figure 1. Building Renovation Site (Aerial View)

NOT TO SCALE

While the scaffold was moved, the victim walked backward and pulled on the scaffold while the coworker pushed it across the ground. When it was in the position shown in Figure 1, the victim lifted the leading edge of the scaffold to get the caster closest to the asphalt up and onto the asphalt. When he lifted the front of the scaffold, it tilted toward the power line and the southwest corner of it contacted the power line. A path to ground was completed through the victim and he momentarily remained in contact with the scaffold until the power line broke. When the line broke, the victim was thrown several feet from the scaffold and he landed on the asphalt parking area. The coworker who was pushing the scaffold received an electrical shock but was not seriously injured.

Two employees in the building heard a loud bang when the wire burst and saw the victim on the ground immediately after the incident occurred. They immediately placed a 911 call and then rushed outside and one of them began CPR. Emergency medical personnel arrived within several minutes and continued CPR as the victim was transported to a local hospital where he died about one hour later.

## CAUSE OF DEATH

The cause of death listed on the death certificate was electrocution.

## RECOMMENDATIONS/DISCUSSION

**Recommendation #1: Contact the local electrical utility to assist or provide guidance whenever work is performed in the vicinity of overhead power lines.**

Discussion: Whenever work involving large pieces of conductive materials, scaffolds, ladders, long-handled tools, or boomed vehicles is done near energized overhead power lines, the local electrical utility company should be notified. Utility companies can de-energize power lines, insulate lines with insulating blankets or hoses, or temporarily remove power lines during the duration of work. Electrical utility companies can provide assistance and guidance for safe work practices near overhead power lines. Through the joint cooperation of businesses and their local electrical utilities, actions can be taken to reduce or eliminate the risk of electrocution due to accidental contact with overhead power lines.

**Recommendation #2: Provide extendable aerial platforms instead of fixed scaffolding whenever possible.**

Discussion: Extendable aerial platforms can provide workers with safe work platforms up to heights of more than 100 feet. In many situations, these devices can be used in place of traditional rigid or fixed scaffolding. When properly used, they can eliminate or reduce some of the risks associated with scaffolds and working at elevations. Extendable aerial platforms can be quickly and easily lowered to their fully retracted position before being moved to alternate locations at a work site. In this case, an extendable aerial platform could have been completely lowered before being moved and the potential for contact with the overhead power line would have been totally eliminated. This recommendation to use an extendable aerial platform whenever possible does not preclude the need to de-energize or insulate overhead power lines as described in the above Recommendation 1.

**Recommendation #3: Ensure employees follow safe work practices whenever working near overhead power lines or with materials which may contact overhead power lines.**

Discussion: The dangers associated with overhead power lines continue to result in the occurrence of occupational electrocutions. All tasks performed by workers, including non-routine tasks and tasks not specifically identified as requirements of a worker's job, should be evaluated and the associated job hazards identified. Safe work practices and procedures should then be established to ensure that workers can safely complete all routine and non-routine tasks. In the vicinity of overhead power lines, safe work practices should include maintaining a minimum distance of 10 feet between conductive materials and power lines of 50,000 volts or less.

## REFERENCES

1. Office of the Federal Register: Code of Federal Regulations, Labor, 29 CFR Part 1928.51 (b), U.S. Department of Labor, Occupational Safety and Health Administration, Washington, D.C., April 25, 1975.

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