



The National Institute for Occupational Safety and Health (NIOSH)



Farmer Dies After Being Crushed By Building He Was Moving

DATE: December 22, 1994

MN FACE Investigation 94MN05101

SUMMARY

A 36-year-old male farmer (victim) died from injuries sustained when a wood frame building he was moving fell. He used two large building jacks to raise one end of the building high enough to slide a skid under the building. He then lowered the jacks and set the building on the skid. The building was not secured or fastened in any manner directly to the skid. He hooked a chain around one end of the skid and then hooked the chain to the hitch of his four-wheel drive pick-up. Using his pick-up, he pulled the skid and building approximately 200 yards across a pasture. As he pulled the building up a slight incline in the terrain, the front of the building slid off the skid. He stopped and used a general purpose jack to raise the front of the building approximately two feet. He did not support the raised building with blocks or stands to prevent it from falling. After he raised the building, he crawled under the front of the building apparently to reposition the skid. The raised building suddenly slipped off the jack and fell on the victim's back, shoulders and head. He was discovered by his brother who raised the building and removed the victim. Emergency personnel were called and arrived at the scene where the victim was pronounced dead. MN FACE investigators concluded that, in order to reduce the likelihood of similar occurrences, the following guidelines should be followed:

- all buildings and/or equipment supported or raised on jacks should be securely blocked if workers are required to crawl underneath the raised unit; and
- when working on the ground, a heavy block should be placed under the base of all jacks.

INTRODUCTION

On September 21, 1994, MN FACE investigators were notified of a farm work-related fatality which occurred August 20, 1994. The county sheriff's department was contacted and releasable information obtained. This information included a copy of their report of the incident and copies of their photos of the incident site. A site investigation was conducted by a MN FACE investigator and a Minnesota Farming Health Project public health nurse on October 4, 1994. During the site investigation, information concerning the incident was provided by the victim's brother.

INVESTIGATION

The victim worked alone to move a wood frame storage building from a remote area of a pasture to the farm building site. The building was 16 feet long by 8 feet wide by 8 feet high. It had a nearly flat roof and a wood floor. On one side of the building was a walk-through door opening that was 3 feet wide by 6 feet high. Although the building hadn't been used for several years, the victim planned to use the building for the storage of oats.

The victim built a skid (see Figure 1) on which he was sliding the building across a pasture at the time of the incident. The rectangular skid consisted of two round poles fastened to two pieces of 4 inch x 4 inch lumber. The poles were approximately 8 inches in diameter by 12 feet long. Between one end of the poles, he nailed a piece of 4 inch x 4 inch lumber that was 4.5 feet long. After he positioned the poles parallel to each other, he nailed another piece of 4 inch x 4 inch lumber, approximately 8 feet long, across the top of the poles near the other end. He fastened the ends of a chain, approximately 15 feet long, around each pole at the points where the shorter piece of lumber was nailed to the poles.

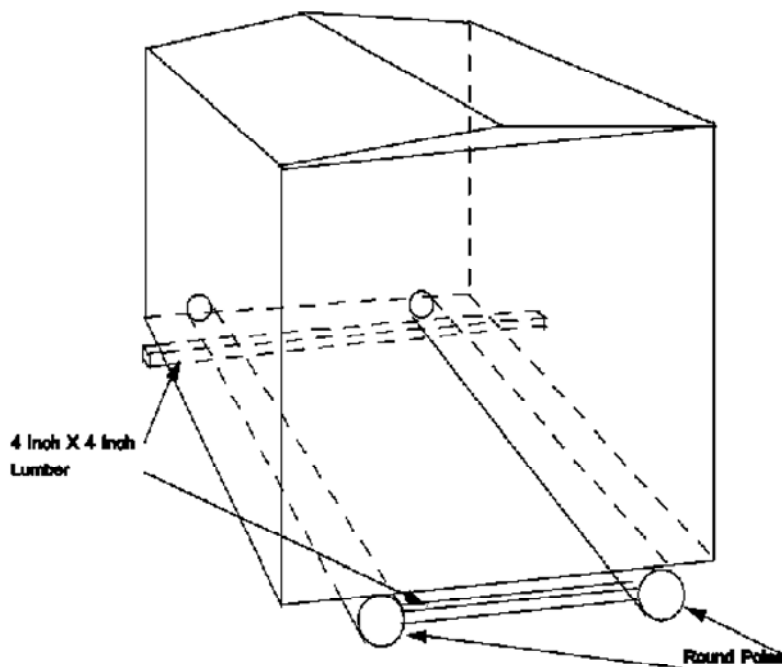


Figure 1. Skid And Building
Not To Scale

He apparently used two large building jacks to raise one end of the building high enough to slide the skid under the building. After he raised the building, he positioned the skid under the building with the round poles parallel to the length of the building. The end of the skid with the chain fastened to it was positioned near the raised end of the building. He lowered the jacks and allowed the building to set on the skid. The building was not secured or fastened in any manner directly to the skid.

He hooked the chain which was fastened to the skid to the hitch of his four-wheel drive pick-up. He drove the pick-up forward and pulled the skid and building approximately 200 yards across a farm pasture. As he pulled the building up a slight incline in the terrain, the front of the building slid off the skid. He stopped and used a general purpose jack to raise the front of the building. The general purpose mechanical jack was similar in design to an old style automobile bumper jack. The jack consisted of a vertical steel bar, 4 feet long, connected to a small steel base plate with a cotter pin. The base was approximately 5 inches wide by 7 inches long. The jack pitman or mechanical lifting device moved up or down the vertical steel bar to either raise or lower an item. This was accomplished by placing a two position latch in either the "up" position to raise a load or in the "down" position to lower a load and then moving the jack handle back and forth in a pumping motion.

After he raised the building approximately 2 feet, he crawled under the front of the building to reposition the skid. He did not support the raised building with blocks or stands to prevent it from falling. While he was under the building, it slipped off the jack and fell on the victim's back, shoulders and head. He was found by his brother who raised the building and removed the victim from under it.

Emergency personnel were called and arrived at the scene a short time after being notified. The victim was pronounced dead at the scene.

CAUSE OF DEATH

The cause of death listed on the death certificate was crush injuries to chest and abdomen.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: All buildings and/or equipment supported or raised on jacks should be securely blocked if workers are required to crawl underneath the raised unit.

Discussion: Various types of jacks, both mechanical and hydraulic, are frequently used to raise buildings and equipment. Although these tools are capable of lifting heavy items, they are not stable devices and items can easily fall. Many factors, such as mechanical failure, shifting load or weight, and inadequate base support may cause the raised item to suddenly fall. If it is necessary for workers to crawl under any item supported on jacks, the item should first be securely blocked. The unit should be blocked with wood or other material which will not crush under the weight of the unit. It should also be blocked high enough to minimize the distance the unit can fall. If the building involved in this incident had been securely blocked prior to the victim crawling under the building, this fatality might have been prevented.

Recommendation #2: When working on the ground, a heavy block should be placed under the base of all jacks.

Discussion: Whenever anything is lifted with a jack, a stable lifting foundation or base should be provided to reduce the likelihood of the raised item falling. This is especially critical if the base of the jack is in direct contact with the ground. When an item is slowly raised, the increasing weight supported by the jack will squeeze the base into the ground. When this happens, the jack may tilt or lean, creating a dangerous situation where the potential for the item to fall is increased. A stable base should be provided by always setting a jack on a large block that will not crush under the weight of the item being lifted. In addition, the surface area of the block contacting the ground should be significantly larger than the base of the jack. Increasing the surface area of the lifting base spreads the weight of the raised item over a larger area. When the weight of the load is spread over a larger area, the amount that the lifting base will squeeze into the ground is reduced and the stability of the raised load is increased. During this incident, the base of the jack was placed directly on the ground. The use of a large block under the base of the jack would not have created a situation where it was safe to crawl under the raised building without adequate blocking as suggested in Recommendation #1. However, placing a jack on a large block is a safe work procedure which should be followed at all times. If this procedure had been followed, the likelihood of the building falling might have been reduced and this fatality might have been prevented.

REFERENCES

1. Agriculture Safety, Fundamentals of Machine Operation, 1987, Deere & Company, Moline, Illinois, Third Edition.

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Page last reviewed: November 18, 2015

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