DATE: October 16, 1995

FROM: Minnesota Fatality Assessment and Control Evaluation (MN FACE) Program
Minnesota Department of Health

SUBJECT: MN FACE Investigation 95MN04001
Farmer Electrocuted While Working On A Bale Conveyor

SUMMARY

This report is based upon a review of a written sheriff's department report, a review of copies of their photos of the incident and an interview with a county sheriff's deputy who responded to the scene.

A 37-year-old farmer (victim) was electrocuted while working on a bale conveyor. The victim and his son were performing general maintenance on the bale conveyor in the hayloft of a farm barn. The conveyor was suspended horizontally near the peak or ridge of the barn roof. It was powered by an electric motor that was mounted on a metal frame of the conveyor. Although the conveyor was mounted in a permanent configuration in the hayloft, electrical power was provided via a long electrical cord and/or an extension cord. The electrical cord insulation was frayed near the motor and apparently contacted the metal frame on which the electric motor was mounted.

While they worked on the conveyor, the victim's son told his father that he received an electrical shock when he contacted the conveyor. The victim touched the conveyor, completed a path to ground and received an electrical shock. The electrical shock caused him to fall from a stack of bales on which he was standing. The victim's son heard his father call for help and immediately ran and turned off the circuit breakers that controlled power to the conveyor. He notified his mother of the incident and she placed a call to emergency personnel. Emergency medical personnel arrived at the scene approximately 10 minutes after being notified. They performed resuscitation efforts at the scene and while the victim was transported to a local hospital where he was pronounced dead approximately one hour after the incident occurred. MN FACE investigators concluded that to reduce the likelihood of similar occurrences, the following guidelines should be followed:

- all electrical equipment and circuits should be de-energized and tested before any

repair or maintenance services are performed;

- wherever possible, electrical outlets should be installed in the vicinity of permanently installed electrical equipment; and

- electrical equipment and components should be routinely inspected and repaired.

INTRODUCTION

On July 13, 1995, MN FACE investigators were notified of a farm work-related fatality that occurred on July 12, 1995. The county sheriff's department was contacted and releasable information obtained. Information obtained included a copy of their report of the incident and copies of their photos of the incident site. A site investigation was not conducted by MN FACE investigators.

INVESTIGATION

On the afternoon of the incident, the victim and his son were performing general maintenance on a bale conveyor in the hayloft of a farm barn. The conveyor was used to move small bales (versus large bales) within the hayloft, thus eliminating the need to manually carry the bales from the front to the back of the hayloft. The conveyor was suspended horizontally approximately 3 to 4 feet below the peak or ridge of the barn roof. It was powered by an electric motor that was mounted on a metal frame at one end of the conveyor. Although the conveyor was mounted in a permanent configuration in the hayloft, electrical power was not provided via a fixed electrical outlet near the electric motor. Photos of the suspended conveyor showed an electrical cord and/or an extension cord, approximately 12-15 feet long or longer, hanging from the electric motor. The electrical cord insulation was frayed near the motor and apparently contacted a metal conveyor frame on which the electric motor was mounted and energized the bale conveyor.

While they worked in the hayloft, the victim's son told his father that he received an electrical shock when he contacted the conveyor. The victim touched the conveyor, completed a path to ground and received an electrical shock. The electrical shock caused him to fall from a stack of bales on which he was standing. The victim's son climbed down to the first level of the barn and turned off the circuit breakers that controlled power to the conveyor. He notified his mother of the incident and she immediately placed a call to rescue personnel.

Emergency medical personnel arrived at the scene approximately 10 minutes after being notified.

They performed resuscitation efforts at the scene and while the victim was transported to a local hospital. He was pronounced dead at the hospital approximately one hour after the incident occurred.

CAUSE OF DEATH

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

RECOMMENDATIONS/DISCUSSION

Recommendation #1: All electrical equipment and circuits should be de-energized and tested before any repair or maintenance services are performed.

Discussion: The hazard of electrocution can be reduced by de-energizing electrical equipment and circuits prior to performing any repair or maintenance activities. Whenever electrically powered equipment is serviced or repaired, it should always be de-energized to reduce the hazards of electrocution. In addition, electrical circuits should be de-energized by the removal of circuit breakers and fuses and, whenever possible, the circuit should be locked out and tagged out . Proper lockout and tag out of circuits can significantly reduce the potential of circuits being inadvertently re-energized by other workers who may not be aware that repair and maintenance work are being performed. After electrical circuits are de-energized, they should be tested before repair and maintenance work is begun to insure that they were successfully de-energized. If the electrical equipment and circuits associated with this incident had been de-energized and tested before the maintenance work was performed, this fatality might have been prevented.

Recommendation #2: Wherever possible, electrical outlets should be installed in the vicinity of permanently installed electrical equipment.

Discussion: Although the bale conveyor involved in this incident had been installed in a fixed configuration in the hayloft, electrical power was provided via a long electrical cord and/or an extension cord. The electrical cord hung from the motor and was exposed to fraying at the point where it contacted the conveyor frame. The permanent installation of an electrical outlet in the vicinity of fixed electrical equipment eliminates the need for long electrical cords and/or the use of extension cords. In this incident, installation of an electrical outlet near the conveyor motor would

have eliminated the need for the long electrical cord. A properly installed outlet also may have eliminated the potential for fraying of the electrical cord due to contact with the conveyor frame. If an electrical outlet had been properly installed near the conveyor motor, this fatality might have been prevented.

Recommendation #3: Electrical equipment and components should be routinely inspected and repaired. This recommendation is in accordance with OSHA Standard 29 CFR 1910.303 (b).

Discussion: Routine inspections, similar to those required in general industry by OSHA Standard 29 CFR 1910.303 (b), should be performed on all electrical equipment and components to identify unsafe conditions. Unsafe conditions such as frayed and broken insulation, improperly grounded equipment and broken or unsafe equipment should be identified and the unsafe condition should be immediately eliminated to reduce the risk of electrocution. Unsafe equipment should be taken out of service until the unsafe condition is corrected and eliminated. In this incident, frayed or damaged insulation on the electric motor cord caused the conveyor frame to become energized. If the damaged cord had been identified and repaired prior to maintenance being performed on the conveyor, this fatality might have been prevented.

REFERENCES

1. Office of the Federal Register: Code of Federal Regulations, Labor, 29 CFR Part 1910.303 (b), U.S. Department of Labor, Occupational Safety and Health Administration, Washington, D.C., July 1, 1994.

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