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OREGON FATALITY ASSESSMENT AND CONTROL EVALUATION
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Fatality Investigation Report

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Sawmill worker crushed during debarker maintenance

SUMMARY

On February 7, 2004, a 24-year-old sawmill employee, working as a millwright, was killed in a routine maintenance operation, while grinding the teeth of the feed rolls inside a log debarking machine. The millwright shut down electrical power to the debarker before entering the intake area, but he did not block the press roll, held aloft by compressed air, with pins available on the frame of the machine for this purpose. While he was inside the debarker, another employee in a different area of the mill shut off the compressed-air system in a separate maintenance operation, which allowed air pressure to drop throughout the plant. As the line pressure dropped, the 6000 lbs. press roll, suspended above him, unexpectedly descended and crushed the millwright. A coworker found the victim when he heard the air-pressure release and went to check the younger man at the debarker. Emergency first responders from the local fire station declared the victim dead at the scene.

Intake of log debarking machine, showing one of two pins affixed to the frame of the machine by a chain. The pins can be inserted into designated slots to prevent the press roll from lowering. (see arrow)

CAUSE OF DEATH: Crushing chest injuries with asphyxiation

RECOMMENDATIONS

- **Prior to performing maintenance operations, de-energize, isolate, and block all forms of hazardous energy. This includes blocking machine parts against motion.**
- **Identify tasks that may expose workers to the inadvertent release of hazardous energy and coordinate work activities to eliminate the exposure.**
- **Employers should develop and implement hazardous energy control programs.**

Key Words: Logging, Machine Safety

INTRODUCTION

On February 7, 2004, a 24-year-old millwright was killed in a routine maintenance operation, grinding the teeth inside a log debarking machine. OR-FACE was notified of the incident by OR-OSHA on February 9. An onsite visit was conducted on February 10. This report is produced from information obtained in an onsite visit, including interviews with persons on scene at the time of the incident, plus law enforcement and medical examiner reports.

The mill has been in operation 35 years under different owners, and is the largest employer in the local area, with about 95 employees. The primary product is dimensional lumber produced from raw logs.

The millwright had worked at the mill for 3 years, a shorter time than many of his coworkers. He had previous experience working on the debarker however, and had worked on the debarker independently prior to the incident. . According to the plant manager, the millwright had demonstrated knowledge of how to properly shut down the electrical system on the debarker and secure the press roll with pins in the frame before performing maintenance. The employer did not have a formal documented training program for this procedure but instead relied upon undocumented on-the-job training, pairing a trainee with an experienced coworker.

The incident occurred on a Saturday, when the mill was not in full operation, but instead about 30 employees were present, concentrating on maintenance work. The maintenance supervisor assigned the millwright to work on the debarker on the morning of the incident. Another worker was assigned the task of replacing an old pneumatic oil-injector system, which involved shutting down the compressed-air supply. The coworker assigned to perform maintenance on the compressed-air system had worked at the mill for only 6 weeks and was apparently unaware of all the consequences of shutting down and bleeding air pressure out of the system in order to perform his work.

INVESTIGATION

The debarker machine removes the bark from marketable logs. The holddown press roll, weighing about 6,000 lbs, holds the log in place against the teeth of the in-feed roll. The holddown press roll is suspended above the lower roller with air pressure. Without support, the holddown press roll lowers of its own weight in about 15 seconds.

On the day of the incident, the millwright began routine maintenance, replacing the worn grip pins, which are welded onto the lower in-feed rolls on the debarker machine. He used a portable handheld right-angle grinder while kneeling down on the lower roller drum, under the holddown press roll. The millwright had shut down the electrical switch gear, located within 5 feet of the debarker. There were no lockout or tagout devices in place at any of the electrical control panels.

The millwright did not block the press roll into place with the safety pins available for this purpose, located on each side of the holddown frame in storage jackets.

The coworker replacing the old pneumatic oil-injector system shut off the air compressor and released the air pressure using controls located in an area distant from the debarker. With the compressed air shut off, the holddown press roll above the in-feed roll of the debarker dropped down onto the millwright as the air pressure was released, crushing him. Insertion of the safety pins in the frame of the debarker would have prevented the press from lowering when the air system was turned off.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Prior to performing maintenance operations, de-energize, isolate, and block all forms of hazardous energy. This includes blocking machine parts against motion.

In this incident, no lockout/tagout procedure was followed. The gravitational energy in the press roll was not mechanically blocked by using pins attached to the frame of the machine, designed for that purpose. Machine parts controlled by pneumatic, hydraulic, or other fluid-operated systems are subject to motion if system pressure is lost, and should always be mechanically blocked before maintenance is started. Blocking machine parts against motion is part of a comprehensive hazardous energy control program.

Recommendation # 2: Identify tasks that may expose workers to the inadvertent release of hazardous energy and coordinate work activities to eliminate the exposure.

Experienced workers at the mill usually “just knew” what maintenance needed to be done, while newer workers were assigned tasks. In this incident, two workers were assigned to maintenance activities on two seemingly independent systems without coordinating their activities. The victim was not aware of the work being done on the compressed-air system. The coworker was not aware that bleeding the compressed-air system would allow the press roll on the debarker to lower or that the victim was working under it. Maintenance work should be coordinated to prevent exposure to hazardous energy. Explicitly identifying and communicating tasks that may expose workers to hazardous energy is part of a comprehensive hazardous energy control program.

Recommendation #3: Employers should develop and implement hazardous energy control programs.

A comprehensive hazardous energy control program could have helped to prevent this incident. Warning labels applied to the debarker, for example, may have reminded the victim to use the blocking pins. Labels applied to the compressed-air controls could alert workers that bleeding the air lines may cause hazardous machine movement at other locations in the facility. Procedures that require a worker-applied lock or tagout on the compressed-air controls and electrical switchgear could provide security against unexpected activation or deactivation by a coworker.

A comprehensive hazardous energy control program should be implemented through written policy and cover the following points.

- Identify and label all hazardous energy sources.
- Specify procedures to de-energize, isolate, block, and/or dissipate hazardous energy.
- Establish lockout/tagout procedures to secure energy control devices.
- Verify that all energy sources are de-energized before work begins.
- Inspect repair work before equipment is re-energized.
- Verify that all persons are clear of danger points before re-energizing equipment.
- Design systems that make it easy to control hazardous energy.
- Train workers in the basic concepts of hazardous energy control.

REFERENCES

National Institute for Occupational Safety and Health. (1999). *Preventing Worker Deaths from Uncontrolled Release of Electrical, Mechanical, and Other Types of Hazardous Energy.* Available online (Nov. 30, 2004): http://www.cdc.gov/niosh/99-110.html