OR-FACE
OREGON FATALITY ASSESSMENT AND CONTROL EVALUATION
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Center for Research on Occupational & Environmental Toxicology
OHSU OREGON HEALTH & SCIENCE UNIVERSITY
Fatality Investigation Report
OR 2005-05-1

Operator crushed while repairing running machine

SUMMARY

On March 17, 2005, a 61-year-old woodworker operating a glue-press machine at a wood-products firm was killed while attempting to replace a glue tray while the machine was running. The glue tray had been removed to correct a glue-dripping problem. The press operator instructed another worker to finish processing a product that was already in the press, while he and a new coworker attempted to reattach the glue tray. The press operator put his head between the frame and the closed top lid of the press in order to see where to latch the glue tray. While he was in this position, the top plate suddenly lifted at the end of a programmed automatic cycle, and crushed the operator's head against the frame. Coworkers witnessed the event and immediately extricated the operator from the machine. The victim was transported to the hospital, where he was pronounced dead.

The glue press operates on an automatic cycle, with a conveyor running beneath a glue roller and into the press.

CAUSE OF DEATH: Traumatic brain injury

RECOMMENDATIONS

- **Completely shut down and lockout machinery before conducting maintenance.**
- **Employers should develop, implement, and enforce a comprehensive hazardous energy program.**
- **Ensure that all machinery moving parts and pinch points are fully guarded.**
- **Employers should conduct regular hazard surveys and follow through with corrective action.**
- **Employers should investigate on-the-job injuries and review work procedures in order to correct hazards and prevent similar incidents.**
- **Employers should implement a preventive maintenance program for machinery, with designated, trained personnel authorized to perform maintenance tasks.**

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INTRODUCTION

On March 17, 2005, a 61-year-old woodworker operating a radio-frequency glue-press machine was killed while attempting to replace a glue tray while the machine was running. OR-FACE received notification of the incident on July 20, 2005. An employer interview and onsite visit were requested but not granted. This report is based on reports from emergency responders, the medical examiner, and Oregon OSHA.

The employer is an Oregon wood-products firm with about 300 employees, specializing in the operation of sawmills, planer mills, and wood remanufacturing. The fatality occurred at the wood-products remanufacturing location, where custom wood products are produced to a customer's specifications. Dimensional wood is sawed and sanded, then run through a glue machine before being recut and resanded, palletized and shrink-wrapped for shipping. The manufacturing plant has 46 employees, working two 8-10 hour shifts, 5 days a week.

According to the OR-OSHA investigation, the employer had a written safety and hazardous-energy control program, but it was not implemented. Only the shift supervisors, the day-shift press operator, and the plant manager were trained in lockout procedures. Comprehensive training on safety procedures was not provided to all machine operators and supervisors. Lockout was not performed by employees while equipment was worked on, maintained, adjusted, unjammed, or during cleanup activities.

Although the facility had a safety committee, members of the committee were not trained, nor active in hazard identification. No periodic safety inspections were conducted, and no procedures existed for the investigation of on-the-job injuries. Three weeks prior to the March 17 fatality, a glue-press worker was seriously injured when caught in the unguarded glue rolls while cleaning up without locking out the machine. No lockout training, installation of machine guards, or other corrective action was undertaken following that incident.

On each shift, the glue-press machine is run by one operator and two helpers. The operator in this incident had 1 year of experience as the night-shift glue-press operator. The operator had not received lockout or equipment maintenance training. The new coworker helping him had been on the job only 15 minutes when the incident occurred.

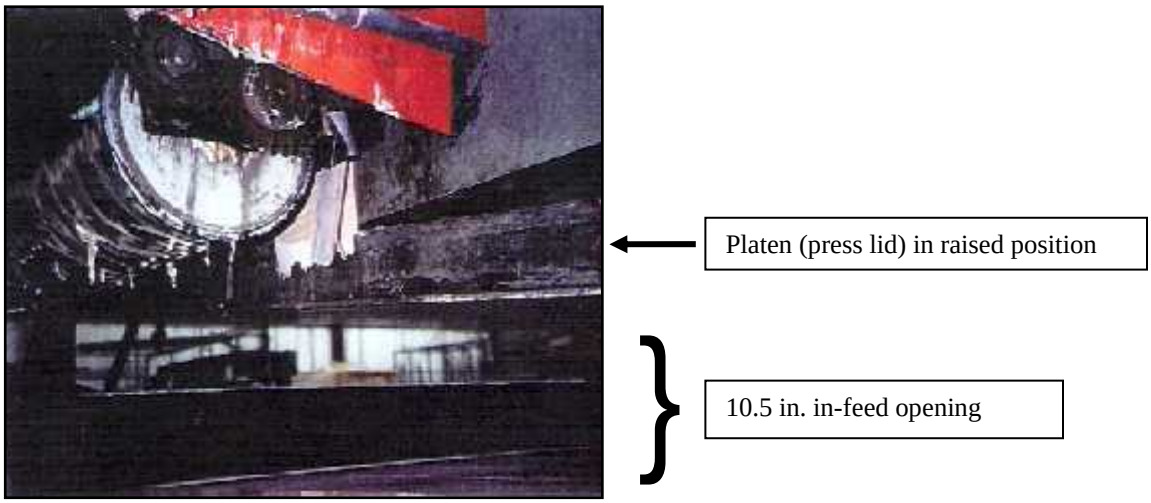
INVESTIGATION

The 1960's model radio-frequency glue-press machine, purchased used by the employer, has conveyor on-load and off-load tables. The machine's chain and sprocket conveyor system pushes pre-cut wood to be glued into the press. A gluing roller with a detachable glue pan is connected to the upper frame assembly by pins, and latched. The in-feed opening to the electric heat press is 10.5 in. high. A hydraulically powered lid, called a platen, automatically depresses and rises during a programmed cycle. The gap between the depressed platen and the upper frame of the machine is 8.5 in.

At the time of the incident, the glue-press conveyor chain and sprocket system, press opening, glue feed rolls, and loading-table mechanisms were unguarded. A makeshift repair to correct a

glue-dripping problem had been made by the operator 2 weeks earlier, using a piece of duct tape to hold a piece of wood veneer to direct dripping glue from the roller into the glue tray. The glue tray in front of the press in-feed had been removed to correct the glue-dripping problem.

The press conveyor had multiple start buttons. The control panel containing an emergency stop button was located at one side of the press. A second emergency stop was located at the end of the off-load table. The electrical panel providing power to the machine was 50 ft away.



A close-up view of the glue press in-feed opening shows the platen above, and the glue roller in front with a piece of duct tape attached.

The glue-press operator was working with two coworkers. He instructed one coworker to finish processing a product that was already in the press, while he and the new coworker attempted to reattach the glue tray. The platen cycle was set to automatically depress and rise every 80 seconds.

Attempting to reattach the glue tray while the glue press was running, the operator had difficulty finding the latch, and put his head into the 8.5 in. gap between the frame and the depressed platen to see it. While he was in this position, the platen suddenly opened and crushed the operator's head against the frame above. He fell to one side, dropping his end of the heavy glue tray.

The new coworker assisting with the glue tray was unable to see the press operator from her position on the other side of the machine. She was unable to hold the tray alone, and dropped it and called to the operator. Getting no response, she called coworkers for help. A responding supervisor went to the other side of the glue press to shut it off at the main power disconnect 50 ft away, and began pushing relief valves to release the hydraulic pressurized lid. The victim was extricated from the machine by coworkers. Emergency responders transported the victim to the hospital, where he was pronounced dead.

RECOMMENDATIONS/DISCUSSION

Recommendation #1. Completely shut down and lockout machinery before conducting maintenance.

Machine maintenance should never be conducted while a machine is running, except in limited cases where operation is a necessary part of a routine maintenance procedure and the worker is not exposed to hazardous energy.

Recommendation #2. Employers should develop, implement, and enforce a comprehensive hazardous energy program.

A comprehensive hazardous energy program includes written safe operating procedures for shutting down, de-energizing, and locking out machinery, particularly during maintenance activities (29 CFR 1910.147). A tagout program provides an additional level of safety by preventing the equipment from being re-energized by a coworker. Some companies have a tagout system with a photo of the employee to help identify whose tagout is on the equipment. All machine operators, maintenance personnel, and supervisors should be well trained in lockout/tagout procedures, and employers need to consistently reinforce these procedures.

Recommendation #3. Ensure that all machinery moving parts, shear, and pinch points are fully guarded.

Employers need to assess all machinery, especially older machinery, and install guards to prevent access to all moving, shear, and pinch points. In this incident, the glue press was an older machine, manufactured without guards, but a retrofit guard is available through the press manufacturer. In cases where specific retrofit guards are not available, private suppliers can provide a wide variety of guards to bring older machinery into compliance with safety standards.

Recommendation #4. Employers should conduct regular hazard surveys and follow through with corrective action.

A firm's safety committee should perform a hazard survey of the workplace and a job safety analysis to identify hazards and unsafe work practices. In this case, the company had a written lockout program, but the procedures were not implemented at this site and periodic inspections were not performed. A hazard survey is best performed regularly. Corrective actions should be set with a schedule for completion. A job safety analysis provides additional information by tracking each step in a work process, identifying safe work procedures and necessary personal protection equipment. Employee safety training and retraining should incorporate the results of the job safety analysis. Employers need to maintain written records related to hazardous-energy program training, in order to promote adequate and accurate training, and promote compliance by both supervisors and front-line workers. Employee retraining must be conducted whenever there is reason to believe an employee has inadequate knowledge of or deviates from the use of safe procedures.

Recommendation #5. Employers should investigate on-the-job injuries and review work procedures in order to correct hazards and prevent similar incidents.

This incident emphasizes the importance of using a safety committee to investigate and respond to on-the-job injuries. The employer had experienced a similar, though less severe incident on the glue press 3 weeks prior to the fatality. Investigation of injury incidents is crucial to the maintenance of an effective safety and training program. Data collected regarding these incidents can provide employers with the necessary information to implement corrective action related to engineering controls, employee work habits, and revised safe-work procedures. An investigation of the nonfatal incident may have identified a hazard and led to corrective action.

Recommendation #6. Employers should implement a preventive maintenance program for machinery, with designated, trained personnel authorized to perform maintenance tasks.

Employers need to ensure that only authorized, competent, and trained personnel perform maintenance on machinery. In this case, there was no designated maintenance person for the machinery. The glue-press operator was not a trained mechanic, and by report had not been instructed in safe operating procedures for maintenance activities.

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CROET at OHSU performs OR-FACE investigations through a cooperative agreement with the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research. The goal of these evaluations is to prevent fatal work injuries in the future by studying the work environment, the worker, the task, the tools, the fatal energy exchange, and the role of management in controlling how these factors interact.

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