



OREGON FATALITY ASSESSMENT AND CONTROL EVALUATION

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Oregon Institute of Occupational Health Sciences



Fatality Investigation Report

OR 2013-08-1

Contract sanitation worker killed cleaning meat blending equipment.

SUMMARY

On April 2013, a 41-year old sanitation worker was killed when he fell into an industrial meat blender (see Figure 1). The worker was a member of a contract cleaning crew for a meat processing facility. On the day of the incident he reported to work and began routine cleaning and sanitation. Cleaning procedures began with a hot water wash of the rotating blades and mechanical parts to remove residual meat product. The hoses used in rinsing were long, and it was a common practice for workers to wrap the excess hose around their bodies (torso and/or legs). The

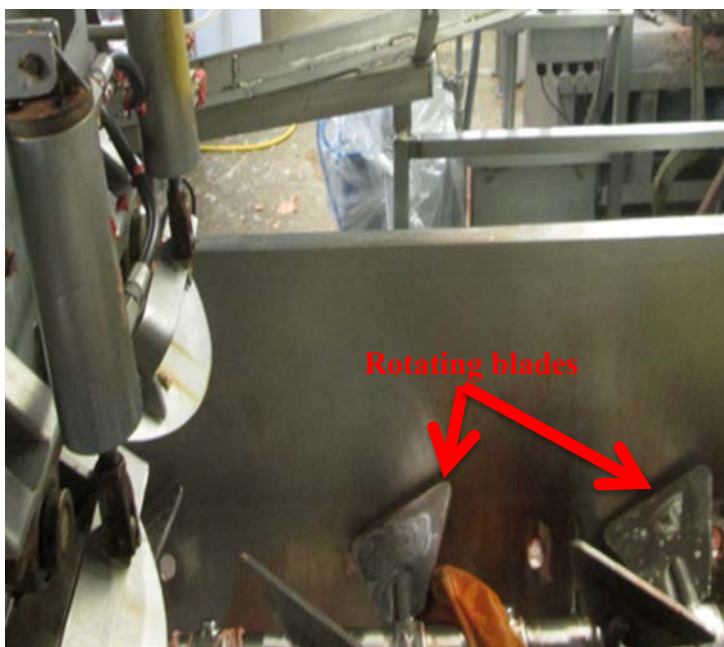


Figure 1. Open top of meat blender where the incident occurred.

incident was not witnessed, but based on the cleaning process used by the worker and described by other employees, it is believed either the hose used to wash down the operating equipment fell into the hopper and the worker was pulled in while entangled in the hose or that he lost his footing on the slippery platform and fell into the blender vat. The worker's supervisor who was familiar with the sounds of the machinery, investigated the source of an unusual sound and discovered a severed hose. He then climbed the stairway onto the elevated platform above the blender and saw the worker and additional hose entangled in the blades in the blender vat. The supervisor summoned help and emergency responders were called. The worker was pronounced dead at the scene.

RECOMMENDATIONS

Keywords: Janitorial, Machinery [NAICS=561720]

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- **Host employers should remove or reduce worker exposures to moving machine parts by identifying and installing guards or interlock features.**
- **Host employers should establish routine procedures for communicating and reviewing hazards in their work environment and control methods with contractors.**
- **Where tasks such as maintenance or sanitation require removal of safety guards, host and contract management must collaborate to ensure that lockout/tagout procedures are implemented including employee training, providing locks for employees, and conducting periodic workplace observation.**
- **Contract/temporary employers should assess tasks proposed by the host employer and collaborate with the host employer to clearly outline supervision responsibilities, training requirements and hazard identification and control methods.**
- **Contract/temporary employees should be trained on injury reporting procedures and hazard recognition and control. Once trained, they should be encouraged and provided positive feedback for identifying hazards, recommending controls, engaging in best safety practices and stopping hazardous work practices.**

OR-FACE supports the prioritization of safety interventions using a hierarchy of safety controls, where top priorities are hazard elimination or substitution, followed by engineering controls, administrative controls (including training and work practices), and personal protective equipment.

INTRODUCTION

On April 2013 a worker fell into an industrial meat blender while trying to wash the blender vat using hot water from a long hose. He died of multiple blunt and sharp force injuries. Oregon OSHA (OR-OSHA) notified OR-FACE of the incident. OR-FACE completed the investigation report by obtaining the OR-OSHA field investigation documentation (including recorded interviews), medical examiner report, police reports, and then conducting follow-up interviews with the OR-OSHA investigator.

The employer provides sanitation services at multiple meat processing locations. In addition to Oregon, they have similar operations throughout the US. At the time of the incident they employed 17 workers in Oregon, nine at the plant where the fatality occurred.

Meat processing equipment that included blenders, feed conveyors, augers, was cleaned and sanitized by the contract workers. The incident involved a meat blender which was used to blend products to a desired fat content. Cleaning and sanitation normally occurred in the late evening and early morning hours. Although enclosed during processing, the top cover of the blender, and the safety guards for augers, conveyor chains and sprockets were removed to provide access during cleaning. The blender was located in a room separated from the rest of the facility's

processing areas and was not visible to other workers consequently there were no witnesses to the event.

Approximately two hours into the shift, the contract supervisor heard an unusual slapping sound coming from the room where the worker had been cleaning. In his investigation of the sound, the supervisor saw a severed hose spewing water. Not seeing the worker in the area, he climbed the stairway onto the elevated platform and saw the worker and hose entangled inside the blender.

INVESTIGATION

A cleaning company was contracted by a meat processing company to provide daily cleaning and sanitation services of their meat processing equipment. The worker had been on the job for about six months. With the exception of the supervisor, the other contract employees were less experienced than the worker and they had been working for the company from two to four months.

The meat processing company (host employer) workers were responsible for some cleaning-related preparation prior to the arrival of the cleaning crew and had slid the blender top cover to the side to provide access to the interior of the blender vat. While standing on a raised platform, workers would wash the interior of the vat with hot water. The platform (see Figure 2) was approximately 38 inches above the floor. The top guard rail of the platform was measured at 38 11/16th inches above the platform surface, see Figure 3.

On the evening of the incident, contract workers began arriving around 9:00 pm and assembled in the lunch room until all production activities were completed. The worker reported to work around 9:30 pm. Co-workers who saw him did not observe anything out of the ordinary about his demeanor or approach to work. Each member of the cleaning crew was assigned to clean and sanitize specific equipment (e.g., blender, conveyors, and augers). The industrial blender that he was assigned to



Figure 2. Platform to access the top of the blender vat.

Figure 3. Top rail height on platform. It's not known how the victim entered the vat, but evidence suggests that he fell over the railing.



clean consisted of two horizontal shafts between 6 and 7 feet long and approximately 24 to 30 inches wide. Each shaft had blades/paddles that rotated in opposite directions (see Figure 1). The blender was used to adjust the fat content by mixing product (~3000 pounds) together until the desired content was achieved. It was the only blender in the room. The room was separated by walls from the rest of the processing area. The worker was working alone cleaning his assigned equipment. Other employees were in the building but none had a direct sight line to the worker.

The cleaning crew, during interviews, described the process for cleaning a blender like the one the worker had been servicing. They would remove the guards without powering down and locking out energy sources. As a result, the motors powering the unguarded blades/paddles, augers, conveyor chains and sprockets were energized. The blender was then turned on and the cleaning would continue with a hot water wash of the blender vat, rotating blades and other mechanical parts using hoses charged with hot water to remove any residual meat product. They worked near unguarded moving parts on work surfaces that were often slippery due to meat and residue from production. Although the contract employer had an energy control program, locks were in the supply trailer outside the building and were not in use. No locks or keys were found on the worker.

At approximately 11:45 pm, the supervisor heard an unusual noise coming from the blender room. He entered the area and did not see the worker but saw water running from a severed hose. He shut the water off at the spigot which was approximately 100 feet from the blender. He climbed the steps onto the elevated platform adjacent to the blender and shut off the blender at the control panel at the blender. He then saw inside the blender vat the worker and hose entangled on the shaft closest to the platform. He summoned help from the facility electrician who was onsite. He was directed by the electrician to shut off the power source to the blender.

There was a galvanized pipe coupler that connected the hoses found inside the blender vat, which may have caused the unusual sound that brought the incident to the supervisor's attention. It appeared that the hose had been pulled into the room from the location of the spigot between an overhead door frame and a steel guard post, see Figure 4.

Although not known, it is believed that while the worker was on the platform, washing down the blender, the hose splice may have caught on the overhead door frame. When he pulled to free the hose, its sudden release allowed the slack in the hose to fall into the blender. During cleaning, the flowing hot water into cold blender vat would have created steam, preventing the worker from seeing the slack fall into the blender. It is likely that he was pulled into the blender when the hose that appeared to have been wrapped around his leg

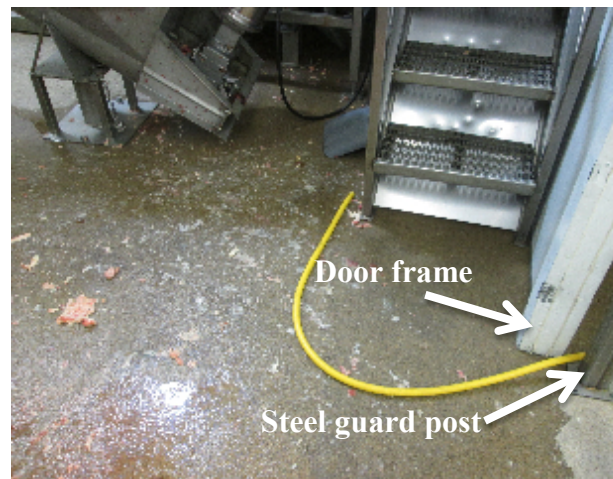


Figure 4. Hose looped between door frame and steel guard post.

and body was caught by the moving parts inside the blender. Or alternatively, he may have slipped on the greasy, wet platform, fell into the blender pulling the hose that was wrapped around his leg and body in with him. The practice of wrapping the hose around their bodies was described by workers and confirmed by the OR-OSHA investigator's observations in subsequent visits. During that visit, the investigator also observed a lock used incorrectly and workers continuing to work around unguarded moving equipment.

Emergency personnel, medical examiner, OR-OSHA investigator and local police responded. The victim was pronounced dead at the scene.

CAUSE OF DEATH: multiple blunt and sharp force injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Host employers should remove or reduce worker exposures to moving machine parts by identifying and installing guards or interlock features.

- The top of the blender was open exposing blades/paddles rotating while the worker was on the platform cleaning from above. It is not known whether a guard such as that pictured in figure 5 was onsite and could have been installed. If not available, the equipment manufacturer could have been contacted for a similar retrofit. An online review of meat processing equipment showed advances in interlocked safety guards for grinding/blending equipment. The OR-OSHA report mentioned that moving feed augers and conveyor chain/sprocket were also exposed and running. Similarly, guards/screens could have been installed to prevent contact with these moving parts.



Figure 5. Example of guard for blender/grinder to prevent access to moving parts but allow cleaning.

Recommendation # 2: Host employers should establish routine procedures for communicating and reviewing hazards in their work environment and control methods with contractors.

- In a routine hazard review, the unguarded moving parts and unsafe practice with hoses might have been identified, prompting facility redesign or procedure modification to prevent injuries.
 - Using prevention through design practices (see Renshaw) may have mitigated the risks of hose entanglement and falling into the blender vat. Spigots near equipment where washing was required would have reduced the length of hose and eliminated the need to pull hose through the overhead door frame thus reducing entanglement, tripping, and ergonomic hazards. Another method for mitigating these hazards would

be self-coiling, retracting hoses or overhead connections that would have reduced the slack in the hose.

- Employees (host and contract), whether participating in routine inspections or general observations, should be given authority to stop work when an unsafe condition is identified. Based on interviews, it was normal practice to remove equipment safety guards without isolating the energy source.

Recommendation #3: Where tasks such as maintenance or sanitation require removal of safety guards, host and contract management must collaborate to ensure that lockout/tagout procedures are implemented including employee training, providing locks for employees, and conducting periodic workplace observation.

- Locks were available but it was not clear whether the contract employees were trained on specific procedures (when, where and how) for energy isolation. There were no locks or keys found on the victim.
- In a subsequent visit, the OR-OSHA investigator observed contract employees working on or near unguarded equipment with service disconnects in the “on” position. One employee was using push button controls on the machine to turn it on and off during cleaning. Another employee had a lock and tag hanging on a service disconnect but it was unlocked.

Recommendation #4: Contract/temporary employers should assess tasks proposed by the host employer and collaborate with the host employer to clearly outline supervision responsibilities, training requirements and hazard identification and control methods.

- The employer directing the workers’ activity maintains responsibility for ensuring employees are adequately trained in hazards and controls and that the information is provided and understood. However, the contract should clearly outline the training and safety responsibilities of both the contractor and host employer. In addition, the host employer should periodically monitor and inspect the onsite activities of the contractor to ensure safe practices are implemented.
- In this incident, contract cleaning and sanitation employees did not appear to be trained on hazard recognition or safe procedures:
 - Employees were instructed to remove the equipment guards for augers, blades, and chain/sprocket assemblies.
 - Locks were available and assigned but not in use. It was not clear whether the employees were trained on specific procedures and trained on how to lock and isolate energy.
 - It was common practice for workers to wrap the hoses around themselves while working near moving machinery.

Recommendation # 5: Contract/temporary employees should be trained on injury reporting procedures and in hazard recognition and control. Once trained, they should be encouraged and provided positive feedback for identifying hazards, recommending controls, engaging in best safety practices.

- Specific tasks for contract employees may have unique hazards and controls. The hazard controls established by the host employer may not adequately address these hazards. Additionally, the hazards may not be identified in the initial assessment or after a change in the process. Therefore, contract employees should be trained to identify hazards.
 - Thorough cleaning may have required the blender to be in operation; therefore, employee involvement to identify methods to prevent accidental contact with moving parts was critical.
 - The use and length of hoses during cleaning exposed contract workers to the risk for entanglement, tripping, or ergonomics.
 - Cleaning the blender may have required the worker to reach over the railing, increasing the risk of falling into the vat. Additional safety precautions could have been identified to prevent falls into the vat, e.g. metal grate (see Figure 5), higher railing, power jet wand (wand would minimize need to reach into vat). The working/walking surfaces were slippery from production residue. The cleaning procedure may have been revised to start with washing the walking surfaces to prevent slips and falls. In addition, requiring slip-resistant footwear/boots for employees should be considered for this work environment.

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