

## FATALITY INVESTIGATION REPORT

### INCIDENT FACTS

**DATE:**

September 10, 2020

**TIME:**

8:20 a.m.

**WORKER:**

38-year-old lead screen plant operator

**INDUSTRY/NAICS CODE:**

Fertilizer (mixing only)  
Manufacturing, NAICS 325314

**EMPLOYER:**

Waste recycling, compost production

**SAFETY & TRAINING:**

Company had a written safety program.

**SCENE:**

Compost screening plant

**LOCATION:**

Western Washington

**EVENT TYPE:**

Caught in or Between

**REPORT #:** 52-51-2022

**REPORT DATE:** 01/20/2022

### Compost Plant Operator Caught in Rotating Conveyor Belt

**SUMMARY**

On the morning of September 10, 2020, a lead operator and his assistant at an outdoor compost manufacturing facility, also known as a screen plant, were operating the plant's biomass screening system that processed recycled organic yard and food waste into compost, topsoil, and mulch. The system's final stage used a radial stacker conveyor that carried and discharged finished compost into stockpiles.

Around 8:15 a.m., the assistant informed the lead that plastic debris were escaping from a metal waste container near the stacker. The lead told the assistant not to worry about it and to get a backpack leaf blower to clean up the debris. The lead then walked toward the tail end of the energized stacker. As the assistant got the blower, he heard the stacker shut down and yelled to the lead. Getting no response, the assistant walked to the machine and saw the lead under it with his head, left arm and shoulder caught between its unguarded steel return idler roller and rubberized conveyor belt. The lead's sweatshirt hood was entangled in the roller, and a spade metal scraper with a long wooden handle was also caught between the roller and belt and pressed against his throat. When the assistant could not pull the lead out, he ran to the operations trailer 75 feet away, shouting for help. The crew supervisor and facility manager came and released the lead by cutting his sweatshirt and the conveyor belt and breaking the scraper's handle. They did CPR until first responders arrived. The lead died at the hospital after nine days on life support.

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**CONTRIBUTING FACTORS**

- Conveyor belt safeguard not in place.
- Lockout/tagout (LOTO) requirements in place but not followed.
- Inadequate LOTO training and enforcement of policies and procedures.
- Periodic reviews of hazardous energy control program not conducted.

**RECOMMENDATIONS**

Washington State Fatality Assessment and Control Evaluation (FACE) investigators concluded that to protect workers from similar hazards employers should:

- Ensure that equipment safety guards are not removed, displaced, or carried off.
- Identify LOTO procedure steps and how to properly use and test LOTO devices' effectiveness for specific equipment.
- Conduct and document periodic reviews at least annually to make sure workers know and can apply LOTO procedures, including how to provide notification before LOTO application and removal on affected equipment.
- Document that LOTO training had been done and kept up to date for all authorized and affected workers.

#### WASHINGTON STATE FACE PROGRAM INFORMATION

The Washington State Fatality Assessment and Control (WA FACE) program is one of many workplace health and safety programs administered by the Washington State Department of Labor & Industries' Safety & Health & Research for Prevention (SHARP) program. It is a research program designed to identify and study fatal occupational injuries. Under a cooperative agreement with the National Institute for Occupational Safety and Health (NIOSH grant# 2U600H008487), WA FACE collects information on occupational fatalities in WA State and targets specific types of fatalities for evaluation. WA FACE investigators evaluate information from multiple sources. Findings are summarized in narrative reports that include recommendations for preventing similar events in the future. These recommendations are distributed to employers, workers, and other organizations interested in promoting workplace safety. WA FACE does not determine fault or legal liability associated with a fatal incident. Names of employers, victims and/or witnesses are not included in written investigative reports or other databases to protect the confidentiality of those who voluntarily participate in the program.

Additional information regarding the WA FACE program can be obtained from:

[www.lni.wa.gov/safety-health/safety-research/ongoing-projects/work-related-fatalities-face](http://www.lni.wa.gov/safety-health/safety-research/ongoing-projects/work-related-fatalities-face)

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#### DEFINITIONS

ANSI	American National Standards Institute
APP	Accident Prevention Program
ASME	American Society of Mechanical Engineers
CSHO	Compliance Safety and Health Officer
DOSH	Division of Occupational Safety and Health
E-Stop	Emergency Stop
JHA	Job Hazard Analysis
L&I	Washington State Department of Labor & Industries
LOTO	Lockout/Tagout
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
SHARP	Safety & Health Assessment & Research for Prevention
WA FACE	Washington State Fatality Assessment and Control Evaluation Program



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## INTRODUCTION

In September of 2020, the Washington State Department of Labor & Industries' (L&I) Division of Occupational Safety and Health (DOSH) notified the Washington State Fatality Assessment and Control Evaluation (WA FACE) Program of the fatality of a lead screen plant operator who was caught in a radial stacker conveyor at a waste management and recycling company that produced organic compost.

Washington State FACE investigators reviewed the DOSH compliance safety and health officer's (CSHO) enforcement case file in lieu of interviewing the employer due to their decision not to participate. Documents reviewed during the course of this investigation included the DOSH inspection summary report, the worker's death certificate, witness interviews, photos, surveillance camera footage, diagrams, and police report.

## EMPLOYER

The employer was a waste management and recycling company that processed organic yard and food waste into compost, topsoil, and mulch products for residential and commercial gardens, agriculture, and landscaping. It was one of Washington State's largest compost producers with an annual output exceeding 350,000 tons.

The employer had operated as a for-profit corporation since 1991, with local family-owned business roots dating back eighty years. The employer had a total workforce of 117 full-time employees across six retail and two production locations. Employees worked year-round, Monday through Friday, plus some Saturdays, in three shifts that began and ended at different times between 3 a.m. and 11 p.m. Truck drivers and screen plant operators were unionized and covered by a collective bargaining agreement.

## WRITTEN SAFETY PROGRAMS and TRAINING

At the time of the incident, the employer had a formal, written accident prevention program (APP). The APP included company-wide safety and health policies and responsibilities, hazard and incident reporting and response systems, emergency response plans, personal protective equipment (PPE) requirements, employee training, safety committee meetings, and monthly site safety inspections. Monthly safety meetings were conducted and documented. The APP contained a hazardous energy control program with lockout/tagout (LOTO) procedure requirements, periodic reviews, and general training that was provided by the health and safety director and facility manager during safety meetings. The energy control program lacked specific LOTO training for the radial stacker conveyor involved in the incident, and only restricted workers from crawling or walking under energized conveyors.

## WORKER INFORMATION

The worker who was fatally injured in the incident was a 38-year-old lead screen plant operator. He was hired in February 2017 as a bulldozer operator with several years of heavy equipment and screen plant experience. In January 2020, he began training to become a lead operator. The training showed him how to operate, inspect, and clean the biomass screening system equipment, monitor product quality and output rates, and perform LOTO requirement procedures. After ten days of training, the facility supervisor deemed the operator to be fully capable of performing his new duties safely and effectively. The lead worked a nine-hour shift from 5 a.m. to 3:30 p.m., Monday through Friday. He was considered a good worker and had no disciplinary record.

## EQUIPMENT

The screen plant where the incident occurred featured a biomass screen system that processed organic yard and food waste into compost, topsoil, and mulch products. The multistage system sized, cleaned, and sorted the waste by using various conveyors, hoppers, and chutes (photo 1) that required three to four workers to operate. It included two radial stacker conveyors that were custom-built by Transco Northwest Inc. and certified by the Mine Safety and Health

Administration (MSHA). The stacker manufacturer used the employer's hourly stockpile production rate goals to select the machine's conveyor belt, drive motor, and gearbox. The stacker involved in the incident featured a 64-foot long by 36-inch wide by ¾-inch thick rubberized flat conveyor belt (photos 2 and 3). The belt was looped and suspended around head and tail pulleys at both ends of the conveyor frame and driven by a motor at the head pulley. Several rotating steel idler rollers supported the belt along its length. The return roller involved in the incident was located closest to the tail pulley and was 4-feet 6-inches above the ground. The stacker frame rested on a single axle undercarriage with single swivel wheels at opposite ends that allowed it to be moved. Processed compost was loaded from a chute onto the tail end of the conveyor belt that carried it up to the head end where it discharged into a stockpile.



**Photo 1:** Biomass screening system equipment in screen plant where worker was fatality injured. Red arrow indicates radial stacker conveyor involved in the incident.



**Photos 2 and 3:** Left photo shows front side view of radial stacker conveyor involved in the incident. Right photo shows rear side view of stacker. Red arrows show the conveyor's tail end location where the lead screen plant operator was pulled in between the return idler roller and conveyor belt.

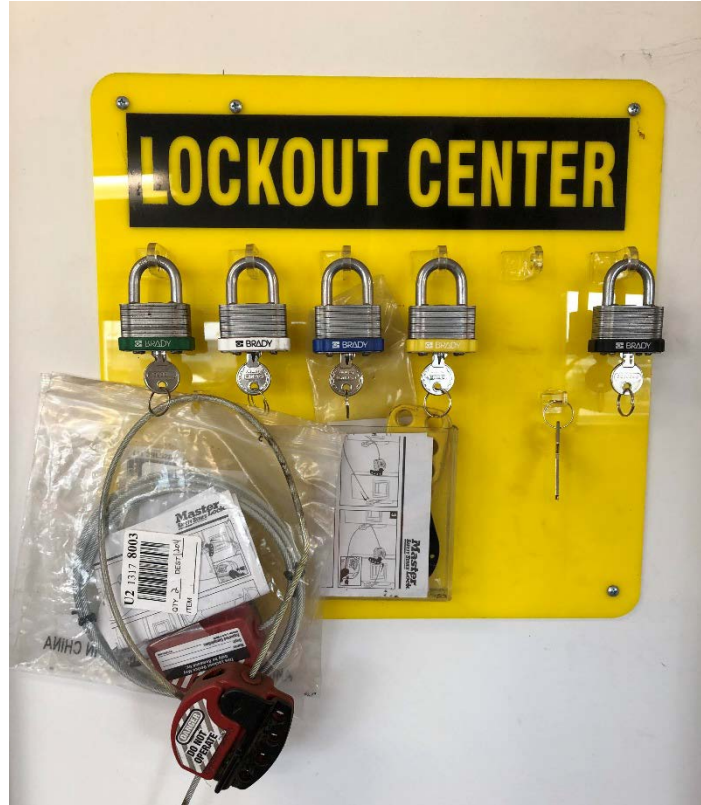
The stacker's safety features included an emergency stop (E-Stop) located in a central control panel shed and a plastic guard that partially covered the return idler roller to prevent someone from being drawn between the roller and belt. Only mechanics were allowed to remove the guard, which they could do by lightly tapping it out of its holding brackets with a hammer. Warning stickers were applied on the guard (photo 4). The stacker manufacturer provided a parts manual to the employer but did not publish safety instructions or a user's manual for custom-built machines such as this one.

Screen plant operators performed and documented daily inspections on the stacker before using it. Only visual inspections were allowed when the stacker was energized. The employer's APP also restricted workers from crawling or walking under energized stackers. Workers used backpack leaf blowers and water trucks with hoses to clean up debris and control dust around the stacker. The employer's equipment mechanics maintained the stacker and checked its internal parts monthly. Workers shut down the stackers for several minutes between each shift for cleaning. Any maintenance or cleaning performed directly on the stacker required a full LOTO procedure to prevent workers from getting caught in or between its rotating parts. Only authorized workers who were designated and trained by the facility manager or site supervisor were allowed to perform LOTO procedures. The lead operator was among the workers authorized to perform LOTO.



**Photo 4:** Plastic guard with warning signs that was missing on the return idler roller on the radial stacker conveyor involved in the incident. The photo also shows a rubberized disk idler roller that replaced the steel roller involved in the incident. Disk rollers help minimize material build-up and the need for frequent cleaning.

The employer's LOTO requirement procedure was not specifically designed for the stacker but presented general steps to shut down a machine, deactivate and lock out the energy isolating device, dissipate or restrain stored or residual energy, and disconnect the machine from the energy source. The plant's LOTO station was kept in the operations trailer that was 75 feet from the incident location (photo 5). The stacker's main power switch and E-Stop were located in a central control panel shed near the center of the plant about 70 feet away from the incident location (photos 6 - 10). During LOTO for cleaning, workers used rakes, shovels, metal spade scrapers, and water trucks with hoses to remove hard material that was stuck on the machine.

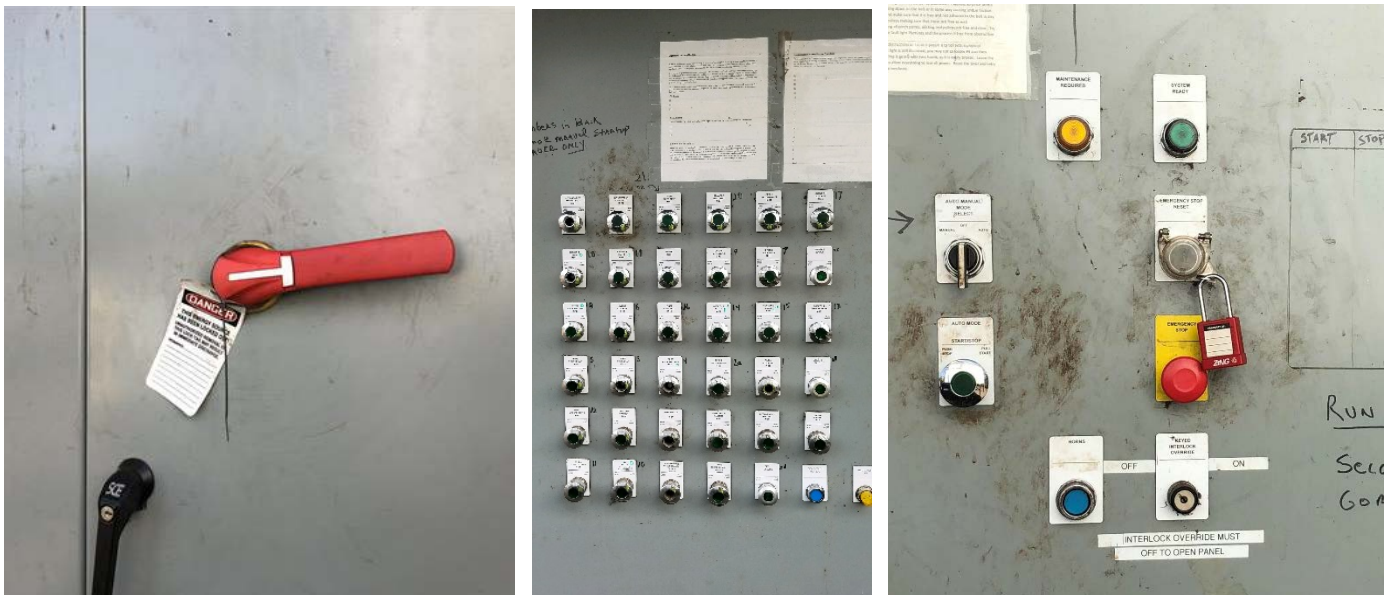


**Photo 5:** LOTO station with padlocks that was in the operations trailer 75 feet away from the incident location.



**Photos 6 and 7:** Red arrow in left photo shows central control panel shed location, and the blue arrow shows incident location approximately 70 feet away. Red arrow in right photo shows close up of central control panel shed.





**Photos 8, 9, and 10:** Left photo shows blank LOTO danger tag on main power switch in central control panel shed. Tags should be signed, dated, timed, and have contact info, at a minimum. Center photo shows power buttons on central control panel for the biomass screening system equipment. Right photo shows red E-Stop button and mechanic's padlock with no identifying information on E-Stop reset button. Photos taken after incident.

## INCIDENT SCENE

The incident scene was the outdoor screen plant where final compost processing was done. The plant contained stationary and mobile equipment that included the biomass screening system, material loading vehicles, tool and equipment sheds, product stockpiles, biofilters, and waste storage containers and trailers. Hazard sources in the plant included conveyor belt rotation, truck and heavy equipment traffic, organic vapors, dust and debris, low light during early morning and night hours, and uneven surfaces resulting from a mixture of compacted dirt and loose compost. Depending on the specific work tasks, personal protective equipment (PPE) requirements for plant workers included work boots, high visibility vests, work gloves, hard hats, hearing protection, and fall protection harnesses when using aerial lifts. Thirty-five workers were on-site at the facility when the incident occurred. Only the injured operator and his assistant were working in the area around the radial stacker conveyor involved in the incident. The crew supervisor, facility manager, and system engineer were approximately 75 feet away inside the on-site operations trailer.

## WEATHER

The incident happened around 8:20 a.m. The weather was sunny with a light breeze and temperature of 67 degrees. The sun set at 7:32 p.m. <sup>1</sup>

## INVESTIGATION

On September 10, 2020, the lead screen plant operator was working his usual nine-hour work shift in the screen plant that began at 5:00 a.m. He and an assistant operator were performing their regular duties of operating, monitoring, maintaining, and cleaning the biomass screening system. At around 8:15 a.m., in an open outdoor area of the plant, the assistant informed the lead that plastic debris were escaping from a metal waste collection container near the radial

stacker conveyor. A diesel-powered air vacuum separation system suctioned the plastic debris from the compost and disposed it in the container before the compost was loaded from a chute onto the stacker's conveyor belt. The lead told the assistant not to worry about the debris and instructed him to get a backpack leaf blower that was on a table 10 feet away. The use of leaf blowers allowed workers to maintain a safe distance from the energized stacker when they needed to clean up debris that was on and around it.

A full LOTO procedure was required whenever workers had to make contact with the stacker to clean and maintain it. The screen plant's LOTO station and central control panel shed were located around 70 feet from the machine. Post-incident interviews with screen plant operators by the CSHO indicated that LOTO procedures were done multiple times per shift to remove built-up material that was stuck to the machine. The lead operator's last documented LOTO training was in 2019, though he also received it in 2020 while training to become a lead operator. Despite his training and experience with the LOTO procedure, he did not perform it prior to the incident.

When the assistant went to get the leaf blower, the lead walked toward the tail end of the stacker involved in the incident. No one saw the lead walk under the stacker. About thirty seconds later the assistant heard the stacker shut down. He yelled out to the lead but got no response. He then walked to the stacker about 20 feet away and saw the lead's head, left arm and shoulder caught between its return idler roller and conveyor belt. The lead's sweatshirt hood was entangled in the roller, and his feet were dangling off the ground. A spade metal scraper with a 5-foot wooden handle was also caught between the roller and belt and pressed against the lead's throat (photo 11).

The compliance safety and health officer's (CSHO) incident investigation found that the return roller's plastic guard was missing. During interviews by the CSHO, other screen plant workers could not indicate how long the guard was missing or where it was located. Plant supervisors speculated that the lead may have been pulled into the conveyor by his sweatshirt hood or the scraper handle, if he was using it to clean debris off the roller. The stacker shut down because an amperage spike tripped its conveyor motor's protection switch when the lead became caught in the machine.



**Photo 11:** Conveyor belt and unguarded steel return idler roller with metal spade scraper tool that was pressed against the lead operator's throat. Responding workers cut the belt and broke the tool's wooden handle to release the operator. Photo taken after incident.



The assistant's attempts to release the lead failed. He then ran to the operations trailer 75 feet away, yelling for help. The crew supervisor and facility manager ran out of the trailer in response. The system engineer stayed behind to call 911.

The crew supervisor got a knife from his truck that was parked 50 feet away and used it to cut the lead's entangled sweatshirt from the roller. The facility manager called for the system engineer in the operations trailer to come with another knife to cut the conveyor belt. The injured lead was not immediately released because the metal scraper's wooden handle was still pressed against his throat. After the manager and supervisor combined their strength to break the handle in half, the lead fell into the supervisor's arms. The manager then called the health and safety director who was at the employer's other production location. Workers performed CPR until first responders arrived and took the lead to the hospital where he died after being on life support for nine days.

### CAUSE OF DEATH

According to the death certificate, the coroner reported the cause of death as blunt force injury of the neck and back.

### CONTRIBUTING FACTORS

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in the injury or fatality. Washington FACE investigators identified the following as key contributing factors in this incident:

- Conveyor belt safeguard not in place.
- Lockout/tagout (LOTO) requirements in place but not followed.
- Inadequate LOTO training and enforcement of policies and procedures.
- Periodic reviews of hazardous energy control program not conducted.

### RECOMMENDATIONS/DISCUSSION

**Recommendation:** Ensure that equipment safety guards are not removed, displaced, or carried off.

Discussion: The plastic guard was missing on the radial stacker's return idler roller that pulled the lead operator into the machine's conveyor belt. The lead was 6-foot tall. The space between the bottom of the roller and the ground was 4-foot 6-inches, suggesting that the lead bent down to walk under the conveyor. The lead's assistant found him with his head, left shoulder and arm caught between the roller and conveyor belt with his feet dangling off the ground. The lead's sweatshirt hood was also entangled in the roller, and a metal spade scraper tool was caught between the roller and belt with its 5-foot wooden handle pressed against the lead's throat. These circumstances made it hard for co-workers who responded to release the man without using knives to cut his sweatshirt hood and the conveyor belt and their combined physical strength to break the scraper's handle.

The plastic roller guard came with the stacker. The employer's APP prohibited workers from defeating or removing any safety devices and safeguards, and only the employer's equipment mechanics were allowed to remove them. While screen plant workers were required to conduct daily summary reports and pre-trip inspections, machine guards and safety devices were not included in the report form's checklist. During the CSHO's investigation, screen plant workers were unable to locate the missing guard nor indicate how long it was gone. Although workers could not explain why the guard was missing, they stated that machine vibrations had previously caused it to loosen and fall out of its holding brackets that were mounted to the stacker's steel frame. The CSHO also found that the employer did not enforce its APP's restrictions on workers to not walk under energized conveyors. This led to exposing at least nine other workers to the unguarded roller's nip, caught-in or -between hazards. Although walking under the conveyor put the injured lead at greater risk, his injuries could potentially have been prevented had the guard been in place as required.



To help ensure that required equipment safety guards are always in place and effective, management should provide safety training, hazard inspection checklists, and hazard report forms that enable workers to quickly identify and report missing or damaged guards. Management, supervisors, and mechanics should make sure that workers do not use equipment that has missing or damaged guards until they are reinstalled, repaired, or replaced. Workers should also be trained to know about conveyor entanglement hazards caused by loose clothing, long hair, and jewelry, as well as the hazards of using hand tools to clean rotating rollers and belts. Additional hazard controls include replacing steel return idler rollers with rubber disk types (photo 4) to minimize material build-up and installing cable bollards to prevent workers from walking underneath energized conveyors. Employers should always enforce all APP policies and JHA solutions that restrict workers from walking under or near energized conveyors unless a full LOTO procedure is properly in place.<sup>2, 3, 4</sup>

**Recommendation: Identify LOTO procedure steps and how to properly use and test LOTO devices' effectiveness for specific equipment.**

Discussion: The employer's energy control program required workers to use the same LOTO procedure for many different kinds of screen plant equipment, including the radial stacker conveyor involved in the incident. The procedure contained general instructions to shut down a machine, deactivate and lock out the energy isolating device, dissipate or restrain stored or residual energy, and disconnect the machine from the energy source. It did not instruct workers how to test specific locked out equipment to ensure it was disconnected from its energy source(s) nor how to identify, apply, test, and transfer LOTO devices. The LOTO procedure also did not specify applicable equipment where it noted that the safe removal of some forms of blocking may require re-energization of the equipment first and that some equipment could not be locked out but only tagged out to prevent unsafe start up. The CSHO noticed that a danger tag on the main power switch and padlock on the central control panel's E-Stop reset button did not identify who applied the LOTO devices when they de-energized the stacker after the incident (photos 9 and 11). While the employer's LOTO procedure instructed equipment mechanics to use red color-coded locks, a facility supervisor and screen plant operator told the CSHO that authorized workers could use any locks and were not required to write identifying information on danger tags.<sup>5</sup>

The deficiencies in the employer's energy control program underline the importance of having specific, clearly written LOTO procedure instructions for each distinct piece of equipment that is combined with other equipment in biomass screening systems and other multistage production systems. While a system's different types of equipment may appear to share certain hazardous energy features, each separate piece may be made by different manufacturers and have unique hazards and LOTO requirements that should be recognized. The employer should provide LOTO procedure checklists for each piece of equipment to help ensure that workers are correctly following all LOTO requirements. Instructing workers to use the same LOTO procedure on different types of equipment raises injury risk because the procedure may be missing steps that are required to safely de-energize specific equipment. Workers may also be led to perform other safety procedures incorrectly if they see that management has not developed safety instructions adapted for specific equipment. Energy control programs should also assign distinctly marked or color-coded locks and keys to specific individual workers, such as supervisors, operators, and mechanics, and require authorized workers to properly fill out danger tags with their name and signature; date, time, and contact information; and details about when and why the LOTO was performed and may be removed.



**Recommendation: Conduct and document periodic reviews at least annually to make sure workers know and can apply LOTO procedures, including how to provide notification before LOTO application and removal on affected equipment.**

Discussion: The employer's hazardous energy control program did not document periodic reviews of individual worker performance of LOTO procedures. Without periodic reviews an employer cannot be sure that workers who are trained and authorized to perform LOTO are consistently and properly applying their training, knowledge, and skills. When LOTO procedures involve only lockout devices, such as switches and locks, then reviews can be done in a group meeting. When the procedures involve tagout devices, such as danger tags, reviews have to be done with each authorized and affected worker individually. A periodic review may help identify problems such as workers not having or using assigned locks and not properly filling out danger tag information on locked out equipment. Reviews must be conducted and documented at least annually. Review documentation should specify the equipment that the LOTO procedure was used for, the review date, names of workers included in the review, and the reviewer's name and title.<sup>6</sup>

The CSHO's investigation also found that the employer did not require workers who were authorized to perform LOTO to notify the facility manager when they applied the procedure. The lack of such notification increases injury risk because a manager or supervisor may need to communicate LOTO information when multiple workers operate affected equipment across different work shifts or when external contractors visit the work site. Notification is especially vital for operators of biomass screening systems or similar multistage production processes that consist of several different interdependent types of energized equipment. Authorized and affected workers should be trained why and how to properly notify management, supervisors, and co-workers before the application and removal of LOTO from specific equipment. Notification is necessary to prevent premature start-up of equipment before it can be safely used.<sup>7</sup> Performing periodic reviews and reinforcing notification requirements in hazardous energy control programs can positively shape workers' perceptions and behaviors so that they are ready to use LOTO procedures at any time.

**Recommendation: Document that LOTO training had been done and kept up to date for all authorized and affected employees.**

Discussion: The employer's hazardous energy control program required workers to have LOTO training before they performed equipment maintenance and services, and retraining when production procedures changed or workers showed a need to be retrained. Training was provided by the safety director and facility manager during safety meetings. However, the CSHO's investigation found that while the employer documented safety meetings where LOTO training was done, it did not document training for at least three workers who required it. The LOTO training was also general and did not instruct workers in using specific procedures for different types of screen plant equipment, including the radial stacker conveyor involved in the incident.

Providing consistent LOTO training that shows workers how to identify and respond to hazardous situations can prevent serious incidents. This includes training them how to respond if they see a co-worker cleaning or maintaining energized equipment without following LOTO requirements. Such training can improve situational awareness for screen plant workers and motivate them to remind each other of the presence of hazardous energy and the need to perform LOTO requirement procedures. This could possibly have led the assistant operator to remind the lead to follow the LOTO procedure when they discussed cleaning up the plastic debris around the stacker involved in the incident. Training should strictly adhere to the equipment manufacturer's LOTO and E-Stop procedure requirements, whenever possible. Employers should consult with the manufacturer to develop LOTO procedures when they do not receive printed standard user instructions and safety manuals for custom built equipment, such as the radial stacker involved in the incident. Refresher training should be given to workers prior to each time they perform equipment maintenance.<sup>8, 9, 10</sup>



## ADDITIONAL RESOURCES

ANSI/ASSE Z244.1-2016, The Control of Hazardous Energy, Lockout, Tagout and Alternative Methods  
<https://store.assp.org/PersonifyEbusiness/Store/Product-Details/productId/213108824>

ASME B20.1, Safety Standard for Conveyors and Related Equipment  
<https://www.asme.org/codes-standards/find-codes-standards/b20-1-safety-standard-conveyors-related-equipment?productKey=J0881U:J0881U>

Belt Conveyors for Bulk Materials Pt.1: Equipment  
<https://www.nsc.org/getmedia/a422295b-a2a0-4332-9a1c-622feee9ab20/data-belt-conveyors-bulk-materials.pdf.aspx>

Belt Conveyors for Bulk Materials Pt.2: Operations  
<https://www.nsc.org/getmedia/86e5b6c4-0a39-48a5-b168-89f912f16d92/belt-conveyors-bulk-materialspt2.pdf.aspx>

## REFERENCES

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2. WAC 296-806-42002, Follow conveyor requirements established by ANSI and ASME  
<https://apps.leg.wa.gov/WAC/default.aspx?cite=296-806-42002>
3. WAC 296-806-42028, Guard nip points on belt conveyors  
<https://apps.leg.wa.gov/wac/default.aspx?cite=296-806-42028>
4. WAC 296-806-30024, Safeguard pulleys  
<https://app.leg.wa.gov/wac/default.aspx?cite=296-806-30024>
5. WAC 296-803-20005(5), Written Energy Control Program – identifying equipment-specific LOTO requirements  
<https://app.leg.wa.gov/wac/default.aspx?cite=296-803-20005>
6. WAC 296-803-70005 (3), Perform and document periodic reviews to verify employees know and follow the energy control procedures  
<https://apps.leg.wa.gov/wac/default.aspx?cite=296-803-70005>
7. WAC 296-803-20005(2), Written Energy Control Program – procedure, training, and review requirements  
<https://app.leg.wa.gov/wac/default.aspx?cite=296-803-20005>
8. WAC 296-803-60005, Provide and document employee training on the energy control program  
<https://apps.leg.wa.gov/wac/default.aspx?cite=296-803-60005>
9. WAC 296-803-60010, Provide additional training if you use tagout devices  
<https://apps.leg.wa.gov/wac/default.aspx?cite=296-803-60010>
10. WAC 296-803-60015, Retrain employees when necessary  
<https://apps.leg.wa.gov/wac/default.aspx?cite=296-803-60015>



## INVESTIGATOR INFORMATION

Todd Schoonover has a PhD in Industrial Hygiene from the University of Illinois at Chicago. He is a Certified Industrial Hygienist (CIH) and Certified Safety Professional (CSP). Todd is currently the Principle Investigator for the WA FACE Program.

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Randy Clark has a BA from the Evergreen State College. He is a Safety and Health Specialist with the WA FACE Program.

## ACKNOWLEDGEMENTS

This report was reviewed by stakeholders from labor and business communities and various Washington State and Federal worker safety agencies. Though we are unable to acknowledge specific individuals for their contributions to this report, we would like to recognize the following for their help and support of the FACE mission and objectives:

- Washington State Division of Occupational Safety and Health (DOSH)
- Federal FACE Program management (NIOSH)
- Occupational Safety and Health Administration (OSHA)
- Safety & Health Assessment & Research for Prevention (SHARP)

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