

FATALITY INVESTIGATION REPORT

INCIDENT FACTS

DATE:

January 4, 2011

TIME:

3:19 p.m.

VICTIM:

63-year-old supervisor

INDUSTRY/NAICS CODE:

Women's, children's, and infant's clothing and accessories merchant wholesalers, NAICS 424330

EMPLOYER:

Wholesaler of donated used clothing and other merchandise

SAFETY & TRAINING:

Company had a written safety program, but it did not address bale stacking safety.

SCENE:

Warehouse containing stacked bales of used clothing

LOCATION:

Washington State

EVENT TYPE:

Struck by



REPORT #: 52-45-2018

REPORT DATE: 12/10/2018

Supervisor at Used Clothing Processing Facility and Warehouse Dies When Struck by Falling Clothing Bales

SUMMARY

On January 4, 2011, a 63-year-old supervisor at a donated used clothing processing facility and warehouse died when she was struck by falling bales of used clothing.

On the day of the incident, a forklift operator was unloading bales of used clothing from a semi-trailer truck parked at a warehouse loading dock. After unloading the bales from the truck, he proceeded to move them to a storage area where he stacked them against a wall beside other stacks of bales.

The area where the forklift operator was stacking the bales was next to a door leading to the company's shoe department. Clothing bales were stacked on both sides of the door. The employees who worked in this room regularly used this door to access the warehouse. The victim, who was the shoe department manager, was walking toward the door after returning from a break. The new bales were stacked six high and had only been in place for a few minutes. As she approached the stack, the forklift operator noticed that the bales had started to move. He called to her "look out!" As she turned to look toward the forklift operator, four bales fell from the top of the stack. One bale hit the lower part of her body, knocking her to the ground, and then a second bale landed on her upper body. The bales weighed from 500 to 780 pounds and measured approximately 48 inches by 60 inches by 33 inches.

RECOMMENDATIONS

Washington State Fatality Assessment and Control Evaluation investigators concluded that to protect employees from similar hazards employers should:

- Perform a job analysis and hazard assessment of bale storage practices. Based on the results of the job analysis and hazard assessment, employers should create a written safe materials stacking guide and train employees on the procedures.
- Ensure that areas in facilities where bales are to be stored should be of sufficient size and adequate layout to accommodate the intended bales, forklift traffic, and pedestrian traffic without exposing employees to the hazard of bales falling from stacks.
- Ensure that bale storage areas are designated and access limited to authorized employees.
- Ensure that bales are in good condition and are stored in a manner that will minimize the hazard of stacks becoming unstable causing bales to fall.
- Implement daily inspections to evaluate the conditions of bale stacks to ensure stability of the stacks and correct any deficiencies that are identified.



DEFINITIONS

ANSI	American National Standards Institute
APP	Accident Prevention Program
DOSH	Division of Occupational Safety and Health
L&I	Washington State Department of Labor and Industries
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
SHARP	Safety and Health Assessment and Research for Prevention
WA FACE	Washington State Fatality Assessment and Control Evaluation Program

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# 5 U60OH008487), 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. NIOSH-funded, state-based FACE programs include: California, Kentucky, Massachusetts, Michigan, New York, Oregon, and Washington. 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/Research/FACE

PO Box 44330

Olympia, WA 98504-4330

1-888-667-4277

CONTENTS

INTRODUCTION 4

EMPLOYER..... 4

WRITTEN SAFETY PROGRAMS and TRAINING..... 4

WORKER INFORMATION 5

INCIDENT SCENE..... 5

INVESTIGATION 5

CAUSE OF DEATH 6

CONTRIBUTING FACTORS..... 6

RECOMMENDATIONS/DISCUSSION 8

REFERENCES 10

INVESTIGATOR INFORMATION 11

ACKNOWLEDGEMENTS..... 11

DISCLAIMER..... 11



INTRODUCTION

In January of 2011, the Washington State Department of Labor and Industries' (L&I) Division of Occupational Health and Safety (DOSH) notified the Washington State Fatality Assessment and Control Evaluation (WA FACE) Program of the death of a 63-year-old supervisor at a wholesaler recycler of donated used clothing who was struck by falling bales of used clothing at the company's processing facility and warehouse.

Washington State FACE investigators interviewed the incident company operations manager and the plant manager. Documents reviewed during the course of this investigation included the DOSH inspection file, the victim's death certificate, police report, and medical examiner's report.

EMPLOYER

The employer was a merchant wholesaler recycler of used clothing, rags, shoes, and other recycled textiles and secondary materials (secondary materials are manufactured materials that have already been used at least once and are to be used again after recycling). They received donated items from individuals, clothing drop boxes, thrift stores and other charitable organizations from around the United States and Canada. Many of the items they received were those that did not sell at charity stores or were in such condition that they could not be sold. Bales, boxes, and bins of used items were transported by semi-trailer trucks to the employer's warehouse where they were unloaded, sorted, re-baled if necessary, stacked, and stored prior to being loaded into shipping containers and trailers for export to developing nations where the items were resold. Bales would be stored in the warehouse anywhere from hours to months. Approximately 50 million pounds of donated used clothing, institutional rags, and other used items were sold annually.

The employer had a total of 26 fulltime employees who worked 8 a.m. to 4 p.m. Monday through Friday. Established in 1929, the employer's business had been at the incident location since 1947. In 2007, the incident company formed separate business divisions, splitting the export wholesale business from the domestic recycled textile rag and cleaning cloth business. Both businesses were under the same ownership and management and were located in the same warehouse. The company was a fifth generation family owned and operated business.

WRITTEN SAFETY PROGRAMS and TRAINING

The employer had a formal, written accident prevention program (APP) in both English and Spanish. The APP did not address forklift driver training on safe bale stacking practices. Nor did the APP address the training of employees on the hazards of being around stacked bales and the necessity of creating restricted areas for foot traffic in the warehouse. The company had a safety committee with representatives from management and labor – it was a union shop. Safety meetings were held approximately once a month where general safety topics were covered and safety concerns could be raised and addressed. The safety manager was the plant manager who was also responsible for production and quality control. He reported to the facility manager. During operating hours he would frequently walk around the facility and check to see that everything was in good order. If anything needed to be fixed or there were safety concerns he had the authority to address these issues. Training for employees occurred on-the-job. Forklift operators were formally trained by the company safety coordinator. They were required to pass both a written and driving test before being certified to operate forklifts.

The hazard of bales falling from stacks had not been addressed by the employer. They had not perceived it as a safety hazard because it had not been observed by or reported by employees to management, nor had employees raised this as a concern. Annually, fire department inspectors visited the facility to ensure that stacks and rows of bales were configured to be fire code compliant.

WORKER INFORMATION

The victim was the supervisor of the company's used shoe department. She was 63 years old and had been employed by the company for 32 years.

INCIDENT SCENE

The incident took place in the warehouse portion of a 100,000-square-foot building used as a processing facility and warehouse for bales of used clothing and other used merchandise. As many as six bales were stacked to a maximum height of 24 feet and placed in rows. Each bale weighed between 500 to 1,200 pounds (Photo 1).

INVESTIGATION

On the day of the incident shortly before 3:30 p.m., a forklift operator, who was also the loading dock manager, was unloading bales of used clothing from the trailer of a semi-trailer truck parked at one of the company's warehouse loading docks. He had been operating forklifts for the company for 25 years. The forklift had a bale clamp attachment that was used to pick up, move, and stack the bales (Photo 2). After unloading the bales from the truck, he proceeded to move them to a warehouse storage area where he stacked them against a wall beside other stacked bales. He was in the process of building stacks that would eventually be supported by other bales to create rows.

The area where the forklift operator was placing the bales was adjacent to a door leading to the company's shoe department. Clothing bales were stacked one bale directly on top of the other on both sides of the door. The four employees who worked in the shoe department regularly used this door and another located along the same wall to access the warehouse. These were the only employees that regularly walked through this area; this was not a high pedestrian traffic area. The victim, who was the shoe department manager, was returning from a break and was walking through the warehouse toward the door. As she approached within three to six feet of the newly stacked bales, which had been in place for a few minutes and were stacked six high, the forklift operator, who was seated on his forklift approximately ten feet away from her, noticed that the bales had started to move. He called to her "look out!" to get her attention and to alert her to move out of the way of the unstable bales. As she turned to look toward the forklift operator, four bales fell from the top of the stack of six. One bale hit the lower part of her body, knocking her to the ground, and then a second bale landed on her upper body. The bales weighed from 500 to 780 pounds and measured approximately 48 inches by 60 inches by 33 inches.

The forklift operator and another employee immediately removed the bale from the victim. The forklift operator called 911. Emergency responders arrived in approximately three minutes and began to administer CPR. Fire department paramedics arrived shortly thereafter. The victim was taken by an ambulance to a hospital where she died a short time later.

Investigators for the Washington State Division of Occupational Safety and Health (DOSH) and WA FACE investigators were unable to determine why the stacked bales fell. During the DOSH investigation, the incident forklift operator and the two other company forklift operators were interviewed. The incident forklift operator stated that the incident bales were baled before they arrived at the warehouse. Bales are secured with either metal straps or twine. Like all arriving bales they were weighed and visually assessed for integrity. The incident bales appeared to him to be well constructed



Photo 1: A typical bale of used clothing weighing approximately 730–750 pounds and measuring approximately 48 by 24 by 60 inches.



Photo 2: Incident forklift with bale clamp attachment.

and compacted. The forklift operators made visual assessments as to whether the bales were well compacted and how to stack them. They did not re-bale arriving clothing bales unless they had come apart, were in very poor condition, or were too small for shipping purposes. Less compacted bales are stacked on top of more compacted bales. As he was stacking the bales, he did so in the way he usually did and did not see anything wrong with the bales. He had been making separate stacks of bales of two different sizes in what he determined were “small” and “large” bales. The stack that collapsed were “large” bales. His forklift did not contact the bales after he placed them. The forklift operator stated that bales that he and other company forklift operators stacked would occasionally fall, but these were rare events. No one had ever been hurt by these falling bales, and, apparently, these incidents were never reported to management.

CAUSE OF DEATH

According to the death certificate, the medical examiner reported the cause of death as “skull fracture and subarachnoid hemorrhage, multiple rib fractures, pulmonary contusions, lacerations of heart and liver, fractures of the pelvis and lower left extremity due to blunt force injury of head, torso, and extremity.”

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:

- Unstable bale stack.
- High, unbenched, unsecured, independent stack.
- Lack of acknowledgment of hazard of bale stack failure.
- Lack of hazard assessment of bale stacking practices.
- Employees permitted to access area in close proximity to stacked bales.



Photo 3



Photo 4

Photo 3: The victim was walking toward the breakroom door (indicated by the red arrow) when she was struck by two falling clothing bales of used clothing. The “X” shows her location. The bales were stacked six high and placed in the area indicated by the yellow arrow.

Photo 4: Incident location showing the direction of fall that the two clothing bales took before striking the victim, indicated by the “x.” The bales were stacked six high.



Photo 5: Inside the warehouse showing stacked bales of clothing and boxes of used personal items. The photo shows a pedestrian and forklift traffic area used to access to a loading dock and other parts of the warehouse.



Photo 6: The method that company forklift operators used to store clothing bales in the warehouse was to begin by placing bales against a wall and then stack other bales on top and then place others to form rows to create stable storage.

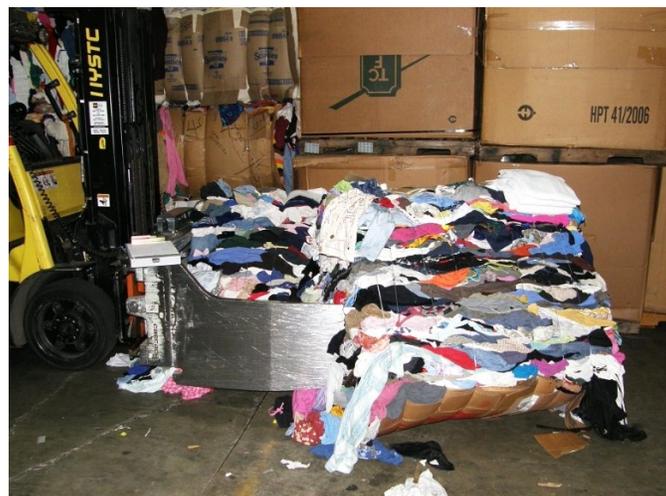


Photo 7: The two bales of used clothing that fell on the victim, shown in the bale clamps of the forklift.

RECOMMENDATIONS/DISCUSSION

Recommendation: Employers should perform a job analysis and hazard assessment of bale storage practices. Based on the results of the job analysis and hazard assessment employers should create a safe materials stacking guidance document and train employees on the requirements of this document.

Discussion: The purpose of the safe materials guidance document is to create and maintain a bale storage area where the stacks are stable and bales do not fall. The guidance document should include, among other recommendations based on assessment of storage practices:

- Forklift driver training on safe practices for bale stacking, methods to identify unsafe bales and stacks, corrective actions to ensure stable bales and stacks.
- Ensure that bales stored in stacks or tiers are secured to prevent them from falling, sliding, or collapsing by stacking, racking, blocking, interlocking, or otherwise securing them.
- Make sure bale stacks are limited in height so that they are stable and secure to prevent sliding or collapse.
- Sufficient room must be allowed for forklifts to move through aisles and work areas.
- Workers should be trained on the hazards of being near stacked bales and their potential fall zones and to observe restricted areas for foot traffic in the warehouse.

Recommendation: Employers and facility operators should ensure that areas in facilities where bales are to be stored should be of sufficient size and adequate layout to accommodate the intended bales, forklift traffic, and pedestrian traffic without exposing employees to the hazard of bales falling from stacks.

Discussion: Insufficient space in bale storage facilities may lead to facility managers or forklift operators deciding to stack bales higher, which can increase the risk of bales falling from potentially unstable stacks and endangering the safety of employees. Employers and facility operators should plan how business operations can be safely conducted without putting employees at risk. The incident employer had been using the same facility to process and store used clothing and other used articles since 1947. As the company grew over the years, what may have been adequate room for their operational needs in earlier years may have been less so at the time of the incident. Used clothing bales, bins, and boxes of other used articles were stacked often six high throughout the warehouse.

After the incident, the employer designated the access door to the shoe department the victim was attempting to enter as an emergency exit only. Employees now use another door where ingress and egress access of the room is by a more spacious aisle that does not have stacked bales located in close proximity to pedestrian traffic. In addition, a safe walking area away from stacked bales should be designated for employees.

Bale storage aisles should be clearly marked to provide a visual guide to forklift operators.

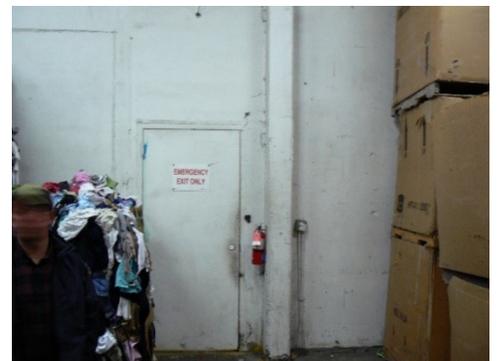


Photo 8: After the incident, the shoe department door was designated by the employer as an emergency exit only.

Recommendation: Employers should ensure that bale storage areas are designated and access limited to authorized employees.

Discussion: The victim and several other employees used a door to a room to go to and from their work area that was directly adjacent to bales of clothes stacked six high on either side of the door. All employees were required to walk through the bale and box storage area of the warehouse to gain access to their work areas, the break room, the loading dock, the company office, and exit the building. There were no designated areas for pedestrian or forklift traffic. There were no designated “off limits” areas for employees and the employer did not have a policy of restricting employees from areas they didn’t need to be. Employers should create and enforce a policy to ensure that no employees should be allowed to walk in the vicinity of the potential fall zone of bale stacks. The fall zone is the area where stacked bales would land in the event of a stack collapse. It is especially important that employees not be permitted to walk in the vicinity of bale stacks when forklifts are placing or removing bales. Safety signage should be prominently located to limit access to the potential fall zones of bale stacking and storage areas. For example, such signage might have a message “WARNING –BALE STACKING AND STORAGE AREA, AUTHORIZED EMPLOYEES ONLY.”

Recommendation: Employers should ensure that bales are in good condition and are stored in a manner that will minimize the hazard of stacks becoming unstable causing bales to fall.

Discussion: Bales that are damaged, insufficiently compressed, have broken straps, or are otherwise assessed to be not fit for safe storage should be set aside and then re-baled before being stacked. Washington State’s workplace safety and health regulations (DOSH) and federal OSHA regulations require that materials be stored safely. These requirements include:

- Store materials so that they do not create a hazard.
- Make sure stored items are limited in height so that they are stable and secure to prevent sliding or collapse.
- Secure stored items such as bundles, containers, and bags to prevent them from falling, sliding, or collapsing by doing one or more of the following: stacking, racking, blocking, interlocking, or otherwise securing them.

OSHA and DOSH requirements do not specifically address clothing or cloth bale storage, but scrap and used clothing recyclers should consider using for guidance the recommendations contained in the American National Standards Institute (ANSI) guidance document ANSI Z245.41-2015 – Facilities for the Processing of Commingled Recycling Materials, Safety Requirements. This standard gives further guidance on safe materials bale storage that can be adopted for the clothing recycling, secondary material, and scrap industries.

ANSI Z245.41 recommends that bale stacks should be limited to four bales high when stacked one on top of the other in straight stacks. Further, ANSI recommends that “stacks higher than four bales shall be offset in a stair-stepped fashion, or arranged in an interlocking pattern, beginning with the fifth layer or lower; or the stack shall be contained by supplemental restraint devices or structures such as posts, walls, or racks.” The standard also states that “loose, incomplete, or out-of-shape bales shall not be stacked or used to support other bales in the stack.”

While used clothing bales are not uniform in size or composition, employers should train forklift operators who unload the bales from semi-trailer trucks and then move and stack them to be able to determine the condition of the bales.

Employers should consider creating visual markers, such as paint stripes, on storage area walls or posts as a guide to forklift operators to indicate the maximum storage height of stacks.

Recommendation: Employers should implement daily inspections to evaluate the conditions of bale stacks to ensure stability of the stacks and correct any deficiencies that are identified.

Discussion: Employers should designate an employee who is a competent person who is knowledgeable of bale conditions and safe stacking methods to conduct regular daily inspections. This employee should have the authority to ensure that identified potentially hazardous conditions, such as leaning stacks and unsound bales, are addressed promptly. Stacks that were initially stable or appeared to be so may become unstable over time. Stack instability may be caused by improper stacking techniques, poor quality bales, bale settling or slippage over time, being disturbed by the stacking, restacking, and unstacking of adjacent bales, or by a forklift inadvertently knocking against the stacks.

REFERENCES

1. Institute of Scrap Recycling Industries, Inc. "Safety Series: The Tipping Point." Scrap Magazine, January/February 2012. <http://www.scrap.org/home/all-scrap-articles/safety-series-the-tipping-point#.W3HmOtFICUk>
2. Institute of Scrap Recycling Industries, Inc. The Scrap Recycling Industry: Textiles <http://www.isri.org/recycling-commodities/textiles>
3. American National Standards Institute. ANSI Z245.41-2015 – Facilities for the Processing of Commingled Recycling Materials – Safety Requirements. <https://webstore.ansi.org/RecordDetail.aspx?sku=ANSI+Z245.41-2015>
4. OSHA. Materials Handling and Storage. <https://www.osha.gov/Publications/osha2236.pdf>
5. Washington Administrative Code. Storage areas, Store things safely. WAC 296-800-22035 <http://apps.leg.wa.gov/wac/default.aspx?cite=296-800-22035>
6. Code of Federal Regulations. Title 29 Labor, Parts 1910.176(b), Handling materials – general. https://www.ecfr.gov/cgi-bin/text-idx?SID=a3751049bd1a2506d6176843db10159c&mc=true&node=se29.5.1910_1176&rgn=div8
7. WorkCover Queensland, Australia. Stability of stacked material. <https://www.worksafe.qld.gov.au/injury-prevention-safety/alerts/whsq/2017/stability-of-stacked-material>
8. Occupational Safety and Health Service, Department of Labour, New Zealand. Safe Stacking and Storage. <https://cdn.auckland.ac.nz/assets/science/for/current-students/HR/health-safety-wellness/documents/SafestackingandStorage.pdf>



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.

Christina Rappin has a BS from The Evergreen State College. She is a Research Investigator with the WA FACE program.

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:

- The employer involved in the incident
- Division of Occupational Safety and Health (DOSH)
- Federal FACE Program management (NIOSH)
- Safety & Health Assessment & Research for Prevention (SHARP)

DISCLAIMER

Mention of any company or product does not constitute endorsement by the National Institute for Occupational Safety and Health (NIOSH). In addition, citations to websites external to NIOSH do not constitute NIOSH endorsement of the sponsoring organizations or their programs or products. Furthermore, NIOSH is not responsible for the content of these websites. All web addresses referenced in this document were accessible as of the publication date.