

Kentucky Injury Prevention and Research Center  
Bona fide agent for Kentucky Department for Public Health  
2365 Harrodsburg Rd., Ste. B340, Lexington, KY 40504 • 859 257-5839

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## INCIDENT HIGHLIGHTS



**DATE:**  
March 20, 2024



**TIME:**  
11:21 a.m.



**VICTIM:**  
33-year-old Hispanic female



**INDUSTRY/NAICS CODE:**  
Wire Product  
Manufacturing /332618



**EMPLOYER:**  
Gate manufacturer



**SAFETY & TRAINING:**  
Formal safety program



**SCENE:**  
Factory floor



**LOCATION:**  
Kentucky



**EVENT TYPE:**  
Caught In / Between



**REPORT#:** 24KY020

**REPORT DATE:** August 23, 2024

## Machine Operator Pulled into Machine, Succumbs to Injuries

On March 20, 2024, a 33-year-old female machine operator was pulled into the wire weaving machine she was operating, by her hair, while she was attempting to clean excess cutting fluid off the wire weaving machine. The victim succumbed to her injuries at the scene of the incident.

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## CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- Failing to follow company procedures,
- Unrestricted access to prohibited areas,
- Performing maintenance on machine while in operation,
- Long hair not secured while working around machinery.

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## RECOMMENDATIONS

Kentucky investigators concluded that, to help prevent similar occurrences, employers should:

- Install physical barriers, marked with “no entry” and provide applicable training,
- Consider providing regular hazard awareness training to employees,
- Consider implementing an auditing procedure to ensure compliance with company procedures and personal protective equipment requirements.

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[Kentucky FACE Program](#)



# KENTUCKY

## State **FACE** Program

### Fatality Assessment & Control Evaluation

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#### Fatality Assessment and Control Evaluation (FACE) Program

This case report was developed to draw the attention of employers and employees to a serious safety hazard and is based on preliminary data only. This publication does not represent final determinations regarding the nature of the incident, cause of the injury, or fault of employer, employee, or any party involved.

This case report was developed by the Kentucky Fatality Assessment and Control Evaluation (FACE) Program. Kentucky FACE is a National Institute for Occupational Safety and Health-funded occupational fatality surveillance program with the goal of preventing fatal work injuries by studying the worker, the work environment, and the role of management, engineering, and behavioral changes in preventing future injuries. The FACE program is located in the Kentucky Injury Prevention and Research Center (KIPRC). KIPRC is a bona fide agent for the Kentucky Department for Public Health.

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## INTRODUCTION

On March 20, 2024, a 33-year-old female machinist (victim) was operating a wire weaving machine, which produces wire fence panels. The victim was familiar with the machine, since she operated it eight hours a day, five days a week. The victim would clean her work area and the wire weaving machine several times throughout the course of her day. While cleaning at approximately 11:32 a.m., the victim's hair was caught in the machine's horizontal shaft, which resulted in her being pulled into the machine and sustaining fatal injuries.

## EMPLOYERS

The employer is a family owned and operated company specializing in the production of residential and commercial fencing. The company, established in the early 1970s, employs approximately 125 people. The company has a total of four manufacturing locations in Kentucky.

## WRITTEN SAFETY PROGRAMS and TRAINING

The employer has an employee handbook that provides general safety guidance for employees. Specifically related to entrapment, the manual states that loose clothing, jewelry, and long hair must not be worn around machinery. Other guidance in the manual relates to the utilization of safety glasses and optional ear plugs. The training procedure is described as "hands-on" training. The company contact stated that upon hire, each new employee is trained on the specific machine he/she will operate. A tenured employee will guide, teach, and shadow new employees for a minimum of two weeks; however, depending on the individual, training can last up to four weeks. Although pay is normally based on production, the company pays new employees hourly to aid in the training process and to allow a new employee to learn at their own pace. Once an employee is released from training, a floor supervisor will observe the employee's performance until he/she feels comfortable with the new employee's abilities, at which time the employee moves from hourly pay to production-based pay. The production goal for the machine operated by the victim, a wire weaving machine, is 65 rolls of fence per day, which a company representative stated can normally be achieved in 6-7 hours.

## WORKER INFORMATION

The victim was a 33-year-old Hispanic female. She was a high school graduate and had worked for the employer for two consecutive years as a machine operator. The employee was one of the most skilled machine operators in the factory, according to a company representative, who stated that the victim was held in high regard for her work ethic and attention to detail.

## MACHINE

The involved machine was a Bergandi A500 wire weaving machine. The machine takes coiled wire and weaves it into fence panels (photo 1). Upon completion, the panels measure 50 feet long and 4 feet wide. After the production of the panel is complete, the machine rolls and binds the newly created panels for shipping (photos 2 and 3).

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Photo 1. Photo of Bergandi A500 wire weaving machine involved in the incident. Photo property of Kentucky FACE.

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Photos 2 and 3. Photos of finished panels measuring 50 feet long by 4 feet wide. Photo property of Kentucky FACE.

### INCIDENT SCENE

The incident occurred on the shop floor of a 30,000-square-foot building that was erected in 2017. The building is utilized to produce wire fencing and gates. This building houses specialized machinery, is in a mostly rural area, and is constructed of metal (photo 4).

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Photo 4. Photo of machine and general area where the incident occurred (red X). Photo property of Kentucky FACE.



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## WEATHER

The weather on the day of the incident was approximately 54 degrees Fahrenheit, with 43% humidity and a 12-mph wind speed out of the west. The weather is not believed to have been a factor in this incident.<sup>1</sup>

## INVESTIGATION

On Wednesday, March 20, 2024, a 33-year-old female machinist (victim) arrived at work at 6:00 a.m., her normal reporting time. Her typical shift was from 6:00 a.m. to 3:00 p.m., Monday through Friday each week. The victim was a tenured employee, having worked for the company for the last two years. The victim's job was to operate a wire weaving machine, which takes coiled wire and weaves it into fence panels. The job is a production-based position, meaning each employee has a daily production goal. The time to complete the goal can vary day to day based on factors such as employee rest breaks, effort, skill, and mechanical readiness of machinery. The victim's goal was 65 panels a day. According to her supervisor, this task was typically achieved by the victim in 6-7 hours.

The Bergandi A500 wire weaving machine weaves wire into panels. A lubricant is utilized to keep the wire at a normal operating temperature. The lubricant often spills onto the exterior of the machine and the floor, creating a slipping hazard (photo 5). The victim was described as having a meticulous cleaning behavior and being one of the best employees at the company. She performed her job exceedingly well. The victim frequently cleaned the front of her machine and work area with the provided shop towels and brake cleaner. Cleaning the front of the machine was an employer-approved task; employees were required to power off the machine prior to cleaning.

By 11:00 a.m., the victim had completed 42 rolls of her 65-roll daily quota and had paused production to clean her work area. A floor supervisor patrolling the shop floor noticed a red light above the victim's workstation at 11:32 a.m., indicating the machine had experienced an error and stopped. The supervisor walked to the machine to investigate the stoppage and help if needed. Upon arriving at the victim's workstation, the supervisor observed the victim's body on the back side of the machine, with her body partially pulled into the machine. The supervisor activated the machine's emergency stop button immediately. The victim was motionless, and the supervisor immediately suspected that her injuries were life-threatening. The company secretary was instructed to contact emergency services, who arrived on scene nine minutes later at 11:41 a.m. Upon arrival, EMS presumed the victim deceased and contacted the county coroner, who confirmed the victim had succumbed to the injuries she sustained in the incident.

After the incident, the company conducted an internal investigation of the death. The shop floor was equipped with video surveillance cameras, but the camera placement did not directly capture the incident. However, the machine's red indicator light was visible in the video footage. The red light was illuminated at 11:21 a.m., which indicated that the machine experienced an error and stopped. This is suspected to be the time in which the victim was pulled into the machine. The floor supervisor noticed the light 11 minutes later and came to investigate. A can of brake cleaner was found behind the machine, in addition to cleaning towels. The investigation concluded that the victim had attempted to clean the rear of the machine, which is a prohibited area, while the machine was powered on and in operation (photo 6). While doing so the victim's hair (ponytail) became entangled in a horizontal shaft, known as the knuckler shaft (photos 7 and 8). This resulted in the victim's head/upper body being pulled into the machine by the hair until the machine jammed. All factory guarding was in place and functional; the machine was relatively new (2020 model). The horizontal shaft itself was not guarded since it is in an area not designed for employee interaction.

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Photo 5. Photo showing lubricant used in the manufacturing process and towels utilized for cleaning. Photo property of Kentucky FACE.



Photo 6. Red X indicates prohibited area where the employee entered and the fatal event occurred. Photo property of Kentucky FACE.



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Photo 7. Red arrow indicating the horizontal shaft in which the victim's hair was entangled. Photo property of Kentucky FACE.



Photo 8. Purple arrows point to red marks drawn on shaft that indicate exact spot the victim's hair wrapped around the shaft. Photo property of Kentucky FACE.

### CAUSE OF DEATH

According to the death certificate, the cause of death was blunt force injuries to the head and neck.

### 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. Kentucky investigators identified the following unrecognized hazards as key contributing factors in this incident:

- Failing to follow company procedures,
- Unrestricted access to prohibited areas,
- Performing maintenance on machine while in operation, and
- Long hair not secured while working around machinery.

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## RECOMMENDATIONS/DISCUSSION

**Recommendation #1: Employers should install physical barriers marked with “no entry” and provide applicable training.**

Discussion: OSHA addresses work area control in standard 1926.1424; the below sections are applicable to the machine involved in this incident:

**1926.1424(a)(1):** The requirements in paragraph (a)(2) of this section apply where there are accessible areas in which the equipment's rotating superstructure (whether permanently or temporarily mounted) poses a reasonably foreseeable risk of:

**1926.1424(a)(1)(i):** Striking and injuring an employee; or

**1926.1424(a)(1)(ii):** Pinching/crushing an employee against another part of the equipment or another object.

**1926.1424(a)(2):** To prevent employees from entering these hazard areas, the employer must:

**1926.1424(a)(2)(i):** Train each employee assigned to work on or near the equipment (“authorized personnel”) in how to recognize struck-by and pinch/crush hazard areas posed by the rotating superstructure.

**1926.1424(a)(2)(ii):** Erect and maintain control lines, warning lines, railings, or similar barriers to mark the boundaries of the hazard areas. Exception: When the employer can demonstrate that it is neither feasible to erect such barriers on the ground nor on the equipment, the hazard areas must be clearly marked by a combination of warning signs (such as “Danger—Swing/Crush Zone”) and high-visibility markings on the equipment that identify the hazard areas. In addition, the employer must train each employee to understand what these markings signify.<sup>2</sup>

To reduce the likelihood of future occurrences, employers should install physical barriers to prevent employees’ entry into dangerous areas. The physical barriers should be marked with applicable signage to warn of the associated hazard (photos 9, 10, and 11). Once in place, employers should train employees appropriately on their application.



Photos 9, 10, and 11. Photos depicting examples of physical barrier and signage that could be utilized to prevent entry and warn employees of associated hazards. Stock photos obtained from Google.

***Recommendation #2: Employers should consider providing regular hazard awareness training to employees.***

Discussion: The involved company does have a lockout/tagout procedure in place; however, a company representative stated that only floor supervisors are authorized to physically lockout or tag equipment to perform maintenance. Machine operators, such as the victim, were to notify supervisors if machine issues occur. After notification, supervisors were authorized to enact the lockout/tagout procedure and perform maintenance on the machines. As a result, lockout/tagout training is not provided to laborers or machine operators due to the employees not being authorized to conduct such tasks.

Cleaning the front of the machine is an employer-approved task for machine operators; however, the policy requires employees to power off the machine prior to cleaning. Upon hire, the victim received two weeks of on-the-job training from an experienced employee. According to the company, a substantial portion of this training included discussing the dangers associated with the operation of the machine. However, it is particularly important that hazard awareness training occurs on a regular basis, rather than only at time of hire. The training should be specific to the types of exposure the employee is likely to encounter. This training should include company-specific policies and procedures that have been developed and align with the expectations the company has for the employee's response to hazards, such as entering prohibited areas and the dangers associated with doing so. Each employee subject to being exposed to the hazard should receive training; the training should include a form of validation that the employees understand and should recur on a regular basis—at a minimum of once annually—to combat complacency. Proper hazard awareness training is critical for workers who could potentially be exposed to the risks associated with the operation of machinery.

The Kentucky Department of Workplace Standards, Division of Occupational Safety and Health Education and Training, often can assist with the development of training or provide training at no cost in many situations. A training request can be submitted online by visiting <https://kysafe.ky.gov/programs/training/Pages/requested.aspx>.

***Recommendation #3: Consider implementing an auditing procedure to ensure compliance with company procedures and personal protective equipment requirements.***

Discussion: According to a company representative, the victim's ponytail became entangled in a horizontal shaft known as the knuckler shaft located at the rear of the machine. Wearing loose fit clothing and having long, unsecured hair can present a grave risk when operating machines with moving parts. These risks may increase based on the season, weather, and temperature, as employees are more likely to utilize long sleeve jackets and shirts to stay warm. Other items such as beards, necklaces, and jewelry can also pose a similar risk. The involved company has a policy in place that reads as follows: *loose clothing, jewelry, and hair must not be worn around machinery*. However, the policy was not followed on the day the incident occurred.

The involved company also prohibited employees from cleaning machines while powered on and in operation, a policy that was not followed the day the incident occurred.

Implementing an auditing procedure can be a helpful activity to observe adherence to workplace policies, identify non-compliance, create coaching opportunities, and increase accountability. Audits should take place frequently and at regular intervals. Audits can be planned, random, or both. Both types of audits have pros and cons:

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<b>Planned Audits</b>	
Pros	Cons
Can be scheduled to ensure that all individuals demonstrate regular competency with policy and procedure.	Unable to identify noncompliant behavior during the routine course of duties.
Scenarios can provide feedback on individual’s ability to apply policy/procedure appropriately based on the situation.	

<b>Random Audits</b>	
Pros	Cons
Ability to assess adherence during normal work.	Requires larger number of audits throughout all shifts.

Re-education and auditing should also take place whenever there is a change to policy, employee expectation, or equipment.<sup>3</sup>

To help prevent future occurrences, employers should consider implementing an auditing procedure to ensure compliance with company procedures and personal protective equipment requirements.



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## REFERENCES

- [1] Historical Weather. <https://www.wunderground.com/history>
- [2] No Entry Area OSHA Regulations. <https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1424>
- [3] Centers for Disease Control and Prevention Auditing. <https://www.cdc.gov/infectioncontrol/pdf/strive/PPE104-508.pdf>

## INVESTIGATOR INFORMATION

This investigation was conducted by Beau Mosley, Fatality Investigator, Fatality Assessment and Control Evaluation, Kentucky Injury Prevention and Research Center, University of Kentucky, College of Public Health.

## ACKNOWLEDGMENT

The Kentucky FACE Program would like to thank the involved company for their assistance with the completion of this report.

## PROGRAM FUNDING

The Kentucky Fatality Assessment and Control Evaluation Program (FACE) is funded by the National Institute of Occupational Safety and Health, the Centers for Disease Control and Prevention (CDC) of the U.S. Department of Health and Human Services (HHS), as part of cooperative agreement 5 U600H008483 totaling \$1,601,266 with 0% financed with nongovernmental sources. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement by, NIOSH, CDC, HHS, or the U.S. government.