KENTUCKY State FACE Program
Fatality Assessment & Control Evaluation

Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
2365 Harrodsburg Rd., Ste. B340, Lexington, KY 40504 • 859 323 4750

REPORT #: 24KY072 **REPORT DATE:** May 5, 2025

INCIDENT HIGHLIGHTS

DATE:
September 16, 2024

TIME:
05:30 p.m.

VICTIM:
20-year-old white, non-Hispanic male

INDUSTRY/NAICS CODE:
484121

EMPLOYER:
Trucking company

SAFETY & TRAINING:
No formal safety program

SCENE:
Parking lot

LOCATION:
Kentucky

EVENT TYPE:
Fire

Wash Bay Attendant Engulfed by Fire Dies from Injuries

On September 16, 2024, a 20-year-old white, non-Hispanic wash bay attendant (victim) attempted to perform maintenance on a compressed liquid petroleum gas (LPG) tank trailer when the tool he was utilizing ignited residual gas escaping from the trailer. The victim's clothing ignited and he later died from the injuries sustained in the incident.

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CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- Improper purging of trailer,
- Intrinsically safe tools not utilized,
- No formal maintenance training program,
- Employee performing duties outside scope of knowledge.

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RECOMMENDATIONS

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

- Implement a trailer flaring procedure with associated training for employees,
- Require the utilization of intrinsically safe tools on or around LPG trailers,
- Implement a formal health and safety program for maintenance staff,
- Prohibit employees from performing duties outside their scope of work.

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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 September 16, 2024, a 20-year-old white, non-Hispanic male wash bay attendant (victim) attempted to utilize an electric grease gun to apply grease to the rear axle of a compressed liquid petroleum gas (LPG) tank trailer. As the victim activated the grease gun, a spark ignited the butane gas that was actively escaping the cargo tank, instantly engulfing the victim in fire. The victim succumbed to the injuries sustained in the incident seven days after it occurred.

EMPLOYERS

The employer is a commercial trucking company that transports compressed gasses across the United States and Canada. Established more than 60 years ago, the company has experienced substantial growth and now operates seven physical terminals and 12 satellite locations across the United States. According to the Federal Motor Carriers Safety Administration, the company travels nearly 7,000,000 miles annually and is registered as an active interstate carrier. The trucking company is registered to transport liquid compressed gases and aggregates.[1] According to a company representative, the company employs 275 people, including drivers, maintenance personnel, and support staff.

WRITTEN SAFETY PROGRAMS and TRAINING

The employer did not have a formal safety training program for maintenance staff members at the time the incident occurred.

WORKER INFORMATION

The victim was a 20-year-old white, non-Hispanic male. The decedent was a high school graduate and had worked for the employer for five months.

INCIDENT SCENE

The incident occurred in a gravel parking lot at the company's Kentucky location. The property houses a large metal building that is utilized as an equipment maintenance facility and employee offices. Both trucks and trailers park around the perimeter of the property (photo 1).

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Photo 1. Google Earth photo showing overhead view of the location where the incident occurred. The yellow location marker represents the approximate location of the incident. The red location marker identifies the dual-purpose office and maintenance building occupied by the involved company.

WEATHER

The weather on the day of the incident was approximately 77 degrees Fahrenheit, with 52% humidity and a 5 mph wind out of the northeast. The weather is not believed to have been a factor in this incident.[2]

INVESTIGATION

On September 16, 2024, a 20-year-old white, non-Hispanic male wash bay attendant (victim) arrived for his shift at 3:00 p.m. The victim worked 2nd shift, which ran from 3:00 p.m. to 11:00 p.m., Monday through Friday each week.

At approximately 5:00 p.m., a commercial driver arrived at the company's Kentucky facility requesting a new trailer for an upcoming delivery of propane gas. Upon request, a maintenance shop employee coupled a semi-truck to the requested tank trailer to position it for the driver. After coupling the semi-truck to the trailer, the employee discovered

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that the brakes on the trailer were seized. As a result, the trailer could not be moved. Concurrently, the employee also observed 75 lbs of pressure on the trailer gauge, concluding that the trailer still contained compressed butane gas.

Considering that the trailer would soon need to be loaded with propane gas, the 75 lbs of butane gas would need to be removed from the trailer. The process of depressurizing the trailer is referred to as flaring. Flaring burns the unwanted gas by utilizing the trailer's internal and external valves, a delivery hose, and a flare system. The flare system sits away from the trailer and expels the gas upward and ignites it, burning the gas rather than releasing raw product directly into the atmosphere (photo 2, diagram 1). However, according to the involved company, in lieu of utilizing the flare, the trailer valve was opened, and the butane gas escaped the trailer via a 20-ft hose that ran along the passenger's side of the trailer, on the ground.

The maintenance employee then directed the victim to retrieve a grease gun to aid in unseizing the brakes. The victim retrieved an electric grease gun from the maintenance shop and proceeded under the tank trailer to grease the brakes himself at approximately 5:30 p.m. Upon activating the electric grease gun, the butane gas escaping the trailer ignited, engulfing the victim and the rear of the trailer in fire (photo 3, diagram 2). The victim was pulled out from underneath the trailer by the other maintenance employee present. The victim began to run toward the shop in a panic. The other maintenance employee present immediately contacted emergency services as he shouted to the victim to stop, drop, and roll, which the victim eventually did. The stop, drop, and roll method extinguished the fire that had engulfed the victim.

Both ambulance and fire arrived approximately 10 minutes after the call for assistance was placed. The trailer fire was extinguished and the victim, who was conscious and communicating, was transported to a Kentucky-based university hospital. The victim, who was placed into a medically induced coma, succumbed to the injuries sustained in the incident seven days later, on September 23, 2024.

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Photo 2. Similar flare system actively working. Image from www.respondertraining.com/product/small-cylinder-flare-kit/.

Photo 3. Photo of LPG trailer involved in the incident.

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Not to scale

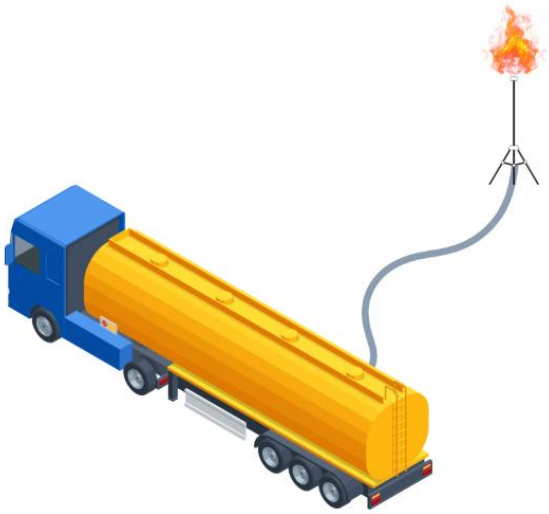

Diagram 1. The proper utilization of a flare system. Diagram property of Kentucky FACE.

Not to scale

Diagram 2. The scene of the incident: improper venting of the trailer and fire that ensued as a result. Diagram property of Kentucky FACE.

CAUSE OF DEATH

According to the death certificate, the cause of death was multisystem organ failure secondary to thermal injuries.

CONTRIBUTING FACTORS

Workplace 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:

- Improper purging of trailer,
- Intrinsically safe tools not utilized,
- No formal maintenance training program,
- Employee performing duties outside scope.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Implement a trailer flaring procedure with associated training for employees.

Discussion: The involved company does not have a formal trailer flaring procedure, although it is a frequent practice. Implementing a formalized procedure within an organization can promote safety by ensuring consistency, improving efficiency, facilitating training, enhancing accountability, and providing clear guidance to employees to follow.

Benefits of formalizing procedures:

Consistency: Having all employees perform tasks the same way reduces risk and maintains quality standards.

Efficiency: Clearly defined steps eliminate unnecessary risk and redundancies, allowing employees to work more safely and effectively.

Training: Documented procedures provide a reference for training new and existing employees.

Accountability: Formalized procedures establish expectations and aid employers in holding employees accountable.

Compliance: Procedures help organizations adhere to regulatory standards.

Once a formalized flaring procedure is implemented, all current and future employees should be trained, evaluated on competency, and informed of the expectation to adhere to the procedure.

Resources on trailer flaring are readily available from many state fire and/or emergency response agencies across the United States. The Florida State Emergency Response Commission's LPG trailer flaring procedure (which can be viewed here) is an example that could aid in the implementation of company policy.[3]

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Recommendation #2: Require the utilization of intrinsically safe tools on or around LPG trailers.

Discussion: According to the Bureau of Labor Statistics, of the 5,283 fatal occupational injuries in 2023, 104 involved fire and/or explosion.[4] Industries where flammable gases are produced, used, handled, or transported present obvious fire risk, but other situations may present less obvious hazards, especially when the flammable gas is odorless. A fire needs fuel, oxygen, and an ignition source. Flammable gases, vapors, and dust provide the fuel, oxygen is present in most environments, and ignition can come from a spark or hot surface. Every fire is dangerous, but in more extreme cases combustion is so rapid as to cause an explosion. Preventing fire and explosions should be a top priority for employers, as they often result in death or injury.[5]

Utilizing intrinsically safe tools can be a helpful strategy in preventing fire and/or explosions when working around flammable gases. Intrinsic safety is an approach to the design of equipment going into hazardous areas. The idea is to reduce the available energy to a level where it is too low to cause ignition. That means preventing sparks and keeping temperatures low.[5] Intrinsically safe equipment is defined as "equipment and wiring that is incapable of releasing sufficient electrical or thermal energy under normal or abnormal conditions to cause ignition of a specific hazardous atmospheric mixture in its most easily ignited concentration." This is achieved by limiting the amount of power available to the electrical equipment in the hazardous area to a level below that which will ignite the gases.[5]

An intrinsically safe tool assumes that fuel and oxygen are present in the atmosphere, but the system is designed so the electrical energy or thermal energy of a particular instrument loop can never be great enough to cause ignition.

In this incident, the escaping butane mixed with the oxygen present in the atmosphere created two of the three elements needed for fire. When the victim activated the electric grease gun (photo 5), which was not intrinsically safe, the spark it emitted resulted in fire, which ultimately led to the victim's fatal injuries.

Kentucky FACE investigators recommend companies working around liquified petroleum gases utilize intrinsically safe tools to prevent the risk of fire and/or explosion.

Photo 5. The electric grease gun used in the incident.

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Recommendation #3: Implement a formal safety and health program for maintenance staff.

Discussion: According to the employer, the company had no formal training program in place for the maintenance staff when the incident occurred. The Occupational Safety and Health Administration (OSHA) requires employers to provide training to employees who face hazards in the workplace. A formal health and safety program may be an effective way to help employers keep employees safe, mitigate risk, and meet regulatory requirements.

According to OSHA, the main goal of safety and health programs is to prevent workplace injuries, illnesses, and deaths, as well as the suffering and financial hardship these events can cause for workers, their families, and employers. OSHA offers a recommended practices guide for employers to use a proactive approach to managing workplace safety and health. Traditional approaches are often reactive, meaning problems are addressed only after a worker is injured or becomes sick, a new standard or regulation is published, or an outside inspection finds a problem that must be fixed. These recommended practices recognize that finding and fixing hazards before they cause injury or illness is a far more effective approach.

The idea is to begin with a basic program and simple goals and grow from there. If you focus on achieving goals, monitoring performance, and evaluating outcomes, your workplace can progress along the path to higher levels of safety and health achievement.

Employers will find that implementing these recommended practices also brings other benefits. Safety and health programs help businesses:

- Prevent workplace injuries and illnesses,
- Improve compliance with laws and regulations,
- Reduce costs, including significant reductions in workers' compensation premiums,
- Engage workers,
- Enhance their social responsibility goals, and
- Increase productivity and enhance overall business operations.[6]

Once the basic program is implemented, the program should continue to develop with the addition of job-specific safety procedures and policies, which may also aid in the prevention of employees performing work outside their scope of knowledge and/or ability by clearly defining job procedures and required training. To prevent similar incidents from occurring, Kentucky FACE investigators recommend employers implement a formal safety and health program.

Click here to learn more about OSHA's Recommended Practices Guide.

Recommendation #4: Prohibit employees from performing duties outside their scope of work.

Discussion: An employee's scope of work (SOW) outlines the tasks and objectives an employee is responsible for completing. Often in document form, an SOW can be beneficial to employers and employees by increasing transparency on assigned tasks, understanding performance expectations, and ensuring that employees are appropriately trained to complete assigned tasks.

The victim involved in this incident was hired as a wash bay attendant; the scope of his job was to pressure wash and clean company trucks and LPG trailers. Washing equipment was the only task the victim was authorized to do. However, the victim was instructed to retrieve a grease gun to assist with trailer maintenance, which ultimately led to the spark that ignited the fire.

Performing tasks outside the scope of an employee's job presents risk to both the employee and others. Some tasks present more risk than others, as with this incident: Working in the presence of hazardous materials subjected employees to grave risk, as the victim did not have the proper training and knowledge to perform the job safely.

Kentucky FACE investigators recommend employers establish formal SOW documents for each employee, review the SOW with each employee, and have the employee sign the document acknowledging his/her understanding of the expectations. Once completed, employers should prohibit employees from performing duties outside their scope of work.

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[4] Bureau of Labor Statistics. https://www.bls.gov/news.release/pdf/cfoi.pdf

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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.

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