

Dump Truck Driver Dies After Unintentional Release of Asphalt

Incident Number: 05KY036



Picture of tailgate which released unexpectedly and dumped hot asphalt onto a driver. Chains were not secured at time of incident.

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Kentucky Fatality Assessment and Control Evaluation (FACE) Program

Incident Number: 05KY036

Incident Date: June 4, 2005

Release Date: December 13, 2005

Subject: Dump Truck Driver Dies After Unintentional Release of Asphalt

Summary

On June 6, 2005 a 55-year-old male dump truck driver (Driver 1) died when he was buried waist deep in 400-degree Fahrenheit asphalt. Driver 1 stopped along the highway to help another dump truck driver (Driver 2), (both were independent truck drivers), who had experienced brake problems. As the two men were examining the pneumatic brake system at the rear of the disabled dump truck, the tailgate opened unexpectedly, spilling hot asphalt onto the decedent who was under the rear of the truck.

To prevent similar incidents, the following recommendations have been made:

Recommendation No. 1: Tailgate chains should always be secured to the dump truck.

Recommendation No. 2: Trip handles on dump trucks should be kept clean from buildup of asphalt residue.

Recommendation No. 3: Independent dump truck owners should follow Kentucky Occupational Safety Standards applicable to dump truck operations.

Background

On June 6, 2005, the Kentucky Fatality Assessment and Control Evaluation program was informed of an occupational fatality via a television newscast. The local coroner's office was contacted and on August 8, 2005, a site visit was made and interviews were conducted with the coroner, witness, and truck owner. Photographs were taken.

According to witnesses, Driver 1 had owned and operated his own trucking business for over 30 years. He primarily hauled asphalt and gravel and recently retired. However, he had decided to leave retirement and contract with another independent owner/operator.

Driver 2 was an independent dump truck driver who had been driving for approximately 20 years. He had purchased the 1984 used dump truck involved in this incident in 2004. After the purchase, Driver 2 had the truck bed redesigned so the tailgate section of the bed was flat instead of lipped. This design eliminated the lip so that tar, rock, etc. could not build up and hamper the closure of the tailgate. The lack of a lip eliminated the need to scrape asphalt or rock when closing and securing the tailgate. Instead of having a shovel on the truck, Driver 2 had a scraper (Photo 1). Driver 2 was a mechanic and performed the maintenance on his dump truck.

The road construction company was working on a local highway construction project. At the time of the incident, the project was at the paving stage. Independent dump truck owner/operators from the area were contracted to haul asphalt to the construction site from the asphalt plant 20 miles away. According to an independent truck driver for the contractor, independent truckers had to meet strict criteria to haul asphalt for the contractor. Criteria included workers compensation insurance, a good driving record, a current commercial driver's license, and compliance with Kentucky Department of Transportation regulations.

The procedure for hauling asphalt was for dump truck drivers to drive into the asphalt facility, then a surfactant would be sprayed onto the bed of the truck. The truck would be weighed, loaded with asphalt, then weighed again. A ticket with the weight of the asphalt and time would be given to the driver and the asphalt load would be covered with a tarp. The driver would then drive the 400-degree Fahrenheit asphalt to the construction site, hand the ticket to a company employee and, upon instruction from the company employee, proceed to dump the asphalt load. This routine would be repeated all day until the contractor called an end to the day. Workers were paid by the load.

According to a weather service, the temperature on June 6, 2005, ranged from 72°F – 90°F.

Investigation

On June 6, 2005, two independent dump truck drivers were hauling asphalt for a construction company building a highway. The location of the highway was in the trucker's home town. One independent trucker (Driver 2) was driving his own dump truck and the other (Driver 1) was driving another independent trucker's dump truck. Driver 2 and Driver 1 had known each other for years and were friends.

The two men drove their dump trucks to the asphalt plant 20 miles north of town. Driver 2 arrived first at the asphalt plant, ahead of Driver 1. Each driver drove into the facility, had the dump truck bed sprayed with surfactant and loaded with 400-degree Fahrenheit asphalt. Driver 2 preferred his truck bed to be loaded from the front to the back; however, the employees at the asphalt plant loaded the bed from the middle to the back. Therefore, asphalt was leaning against the tailgate of the dump truck. Driver 2 drove south out of the asphalt facility toward the highway construction site. Driver 1 was approximately 10 minutes behind him, and another dump truck driver employed by the contractor (Driver 3), was approximately 10 minutes behind Driver 1's dump truck.

It was approximately 7:00 AM and Driver 2 noticed the braking system on the dump truck was locking up. Driver 2 immediately began to look for a safe place to pull off the road and radioed the other dump truck drivers to inform them of his situation. Locating a flat spot on the shoulder on the opposite side of the highway, Driver 2 drove across the north bound lane and parked his dump truck facing south on the northbound shoulder (Diagram 1 & Photo 2). Driver 1 heard the radio broadcast and when he saw Driver 2 on the north bound shoulder, he pulled over onto the south bound shoulder, parked, and crossed the highway to assist Driver 2. Approximately ten minutes later, Driver 3 pulled over to assist the other two drivers.

Driver 2 raised the bed of the dump truck, exited the cab of his dump truck and began examining the airline connections located behind the cab on the driver's side. One tank provided air for both the brakes and tailgate systems (Photo 7). As Driver 2 was examining the pneumatic connections, Driver 1 arrived and began to assist. Both drivers checked brakes and tailgate connections, and found all connections to be secure. They decided to examine the air line connections at the rear of the dump truck. With the front of the bed raised, there was less overhead room at the back of the truck. To make more room under the rear of the truck, Driver 2 lowered the bed of the dump truck to its flat position. This created more space at the back of the dump truck to observe where the air lines tied into the brakes and tailgate systems (Photo 3). Driver 2 crawled under the rear of the dump truck to examine the pneumatic connections from the underside. Driver 1 leaned down under the tailgate of the truck to examine the pneumatic connections from the top side. As the two men examined the connections, they heard air release from the cylinder for the tailgate. Driver 1, realizing the tailgate was going to open and asphalt would come out, tried to kick Driver 2 further under the truck to save him. According to an emergency report, approximately two tons of asphalt fell out from the tailgate, burying Driver 1 up to his waist in the hot asphalt. Driver 2 crawled out from under the truck and with his bare hands, tried to remove Driver 1 from the asphalt. Realizing rescuers needed more space and to try and stop more asphalt from falling on his friend, with both arms and hands severely burned, Driver 2 got back into the cab of the truck and moved it forward a few feet. By this time, Driver 3 had stopped and helped extract Driver 1 from the asphalt by using a shovel. At 7:10 AM a passing motorist called emergency services who arrived at 7:18 AM. Emergency rescuers used shovels to remove Driver 1 from the asphalt and performed CPR and took vital signs for about 20 minutes. The emergency report states Driver 1 was awake but confused and talking to his rescuers for 5 – 10 minutes before passing out. As emergency personnel were trying to save him, Driver 1 died at the scene. The local coroner was summoned. The coroner arrived and at 8:00 AM, declared Driver 1 dead at the scene. Driver 2 was taken to a hospital in another state and treated for severe burns on both arms and hands.

Cause of Death

The Certificate of Death states the cause of death was due to, "Thermal injuries of body due to heated asphalt. Traumatic asphyxia due to compression of body by heated asphalt. Industrial accident."

Recommendations and Discussions

Recommendation No. 1: Tailgate chains should always be secured to the dump truck.

According to several dump truck drivers, chains on tailgates of dump trucks can be used to regulate the volume of rock when it is unloaded. The driver can choose to not hook the chains and dump the full load into one big pile, or hook the chains and spread the rock slowly in a line. When asphalt is unloaded, chains are not usually used. The tailgate is released, and the bed raised in increments to allow the asphalt to slide out of the truck bed. As a backup safety mechanism when hauling asphalt or any other material including rock, the chains should be secured tightly to the side of the truck. Chains should be secured before the bed is loaded with

material and unsecured when the truck reaches its destination and is preparing to dump its load. Securing the chains would provide the driver a backup safety feature if the tailgate trip handle failed.

Note: After this incident occurred, the company made the securing of tailgates with chains mandatory practice for all dump trucks. Now, when a dump truck is loaded, the tailgates are secured with chains to the sides of the dump truck before the driver is given the weight ticket and allowed to leave the facility. The chains are then released when the dump truck is ready to dump the load.

Recommendation No. 2: Trip handles on dump trucks should be kept clean from build up of asphalt residue.

When the surfactant is sprayed on the dump truck bed, the trip handles on the back of the truck should also be sprayed. This should help prevent tar from sticking and building up in the trip handle area. Trip handles should be inspected after the truck is loaded in order to ensure complete closure. This inspection should be performed when the chains are being secured to the side of the truck.

It was discovered that the air line connection for the brake line at the back of the truck had loosened, causing a loss of air pressure in the braking system. This is what caused Driver 2's truck brakes to lock up and forced Driver 2 to pull off the road. According to Driver 2, the brake system shared an air tank with the tailgate system. According to a manufacturer, this is common practice. The tailgate air line had a hold back valve located at the air tank. A hold back valve prevents loss of air in the tailgate system by preventing loss of air in the air tank. As the two men were inspecting the connections at the back of the truck, they heard air release out of the cylinder and knew the tailgate was going to open. According dump truck drivers and mechanics, when air releases from the cylinder, the automatic trip handle releases. After the incident, the truck was inspected by two separate inspectors. One inspection stated, "Found air tailgate latch to have blacktop build-up on latch not allowing it to lock properly." The other inspection states, "Found air system to be OK at this time; but tailgate was not latching properly due to black top build up in latch area of tailgate which allowed tail gate to open when lost all air. Mechanism on right rear brake chamber was leaking and was being repaired at time of incident." Pneumatic brakes and tailgate systems should have separate air tanks.

Recommendation No. 3: Independent dump truck owners should follow Kentucky Occupational Safety Standards applicable to dump truck operations.

Self-employed dump truck drivers should follow the safety standards listed below as part of their regular maintenance routine. Employers with dump trucks should follow them as part of their compliance with KY OSHA. These standards are a minimum of what dump truck owners and employers should be doing to keep themselves and employees safe.

1926.20(b)(2): Frequent and regular inspections of equipment were not made by competent persons designated by the employer in accordance with 29 Code of Federal Regulations (CFR) 1926.20(b)(2).

This requires that competent persons have to be trained to recognize unsafe conditions and know what is required in 29 CFR 1926.601(b)(14). The inspection should have been performed prior to loading the truck. The coupling device and chains should have also been inspected for proper connections.

1926.21(b)(2): The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury.

1926.601(b)(12): Trip handles for tailgates of dump trucks shall be so arranged that, in dumping, the operator will be in the clear.

1926.601(b)(14): All vehicles in use shall be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use: service brakes, including trailer brake connections; parking system (hand brake); emergency stopping system (brakes); tires; horn; steering mechanism; coupling devices; seat belts; operating controls; and safety devices. All defects shall be corrected before the vehicle is placed in service. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, fire extinguishers, etc., where such equipment is necessary.

Keywords

Asphalt
Dump truck
Pneumatic brakes
Pneumatic air lines
Tailgate
Trip handle

References

Occupational Safety and Health Act Consultant
CFR 1926.20(b)(2)
CFR 1926.21(b)(2)
CFR 1926.601(b)(12)
CFR 1926.601(b)(14)

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Photo 1: Picture of scraper.

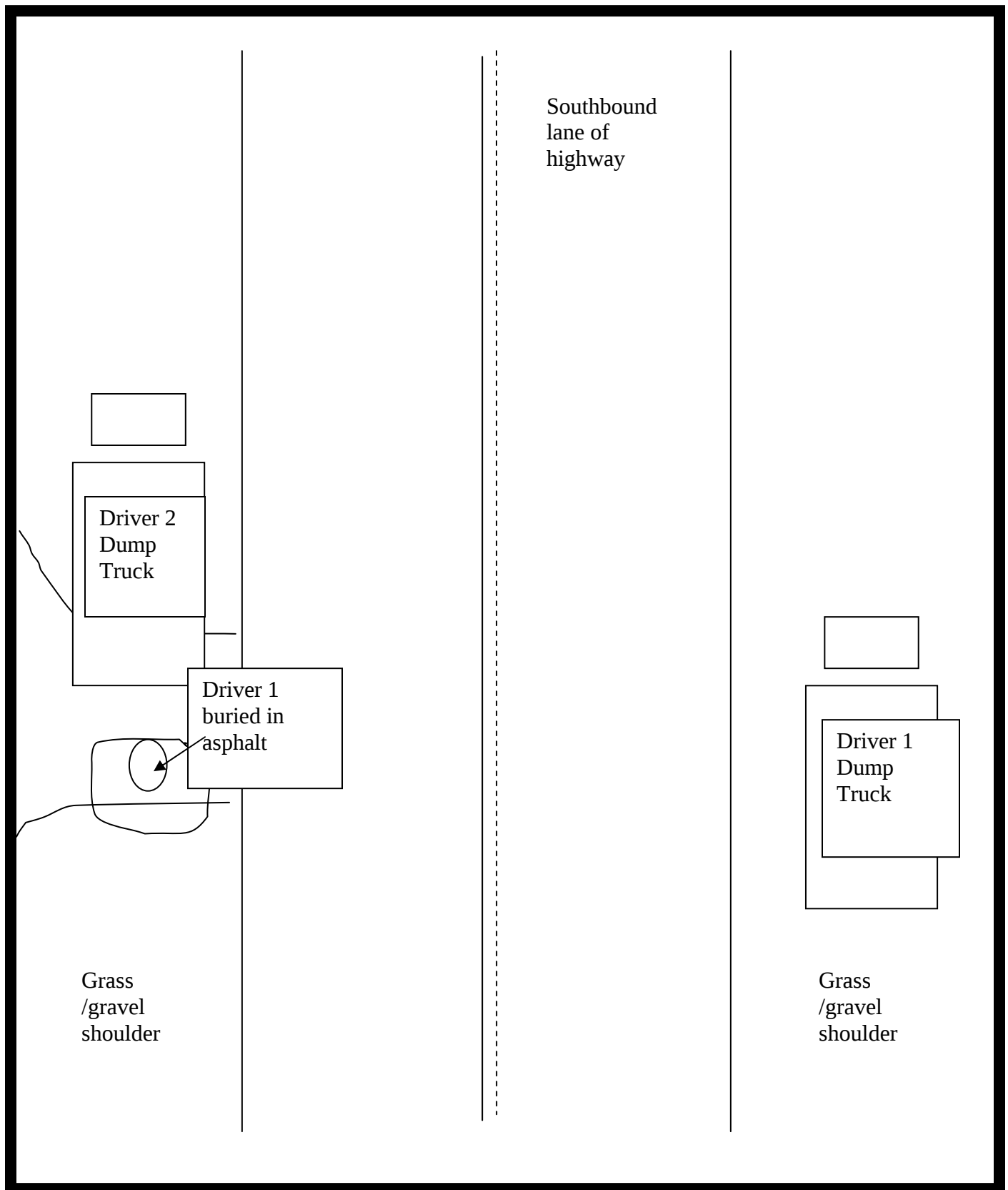


Diagram 1: Diagram of scene. Not to scale.



Photo 2: Northbound shoulder where Driver 2 parked dump truck. The dump truck was facing south.



Photo 3: Picture of brakes and pneumatic lines at rear of truck. Truck bed is flat.



Photo 4: Picture of bed raised at the approximate height when it was raised for Driver 1 and Driver 2 to examine pneumatic connections.



Photo 5: Picture of cylinder and pneumatic lines for tailgate trip handle system. One line goes to air tank; the other to a switch in truck cab.



Photo 6: With truck bed raised, there was not room to inspect pneumatic line connections at the rear of dump truck.



Photo 7: Picture of air tank shared by brake lines and tailgate system