



FINAL Kentucky FACE 95KY06801

Date: 16 October 1995

Subject: Welder is Crushed by an Unmanned Pipelayer

SUMMARY

A 34-year-old male welder was killed after being runover by an unmanned pipelayer. The victim worked for a pipelaying construction company as a contracted welder. On the day of the incident the victim, a welder's helper, and an equipment operator drove to the work site together to begin the day's activities. Access for the worksite was via a single lane temporary road winding up the mountainside through a mixed hardwood forest. The 1/2 mile dirt road carved its way up the hillside; on the left was the bank, on the right was a steep drop off. As the victim drove his pickup truck up the steep mountain path, the weight of the welding equipment in the truck bed caused the front wheels to lift off the ground and the driver lost control of the vehicle. It rolled off the hillside and overturned three times, landing on its side, resting against some trees. The three escaped uninjured and climbed to the road. To retrieve the truck, a pipelayer which was parked further up the mountain on a semi-flat area, was driven partway down the hill. The wire rope from the sidearm of the pipelayer was attached to the hitch on the rear of the pickup and the truck was uprighted and dragged to the dirt road. While the wire rope was attached to the pickup truck, the bulldozer began to roll forward, unmanned, down the hill. The welder's helper and the operator were able to get out of the way of the path of the moving equipment. However, the victim in this incident was crushed as the pipelayer ran over him. In order to prevent similar occurrences the FACE investigators recommend:

- operators should be aware of limitations of the equipment
- equipment should not be operated for purposes other than its intended use
- company policies should address the issue of operating equipment only for intended purposes and provide strict safety guidelines

INTRODUCTION

On 28 July 1995, a welder for a pipelaying company was killed after being runover by a pipelayer. The KY FACE Project learned of the incident from a newspaper article on 29 July and initiated an investigation. Data gathering continued on 8 August when a site visit was made. The county coroner, city police officer, and company vice president were interviewed. The scene was photographed and measurements taken. The equipment manufacturer (safety division) was consulted regarding the machinery involved in the incident. A KY OSH compliance officer who obtained statements from the witnesses was later interviewed via phone.

INVESTIGATION

At the time of the incident the victim was working as a contracted welder for a pipeline construction company which has been in business since 1980 and employs approximately 60 workers including 20 laborers, 15 welders, equipment operators, and administrative staff. Most of the work involves laying natural gas pipelines for utility companies in Kentucky and Virginia. Their safety program includes weekly training

sessions with the employees. This is the company's first fatality.

The victim in the incident was a 34-year-old male who was in good physical condition. He had been employed full-time by this particular company for almost three years and had experience in welding for nearly 20 years. Because he used his own welding equipment which he transported to the work sites in his pickup truck, he was considered contracted labor for the company. The type of work that he performed was API 1104 code welding. Those interviewed reported that he was an excellent welder, a conscientious worker, and was always willing to help out his co-workers.

The construction site at the time of the incident was in a mountainous, rural area and the work involved laying 40 foot lengths of 8" metal pipe for a natural gas line totaling 4300 feet. Using a bulldozer, a one-way temporary road had been created for access to the site of the gas line construction, about a 1 1/2 mile drive up the mountain. The road was curving and steep as it wound up the hillside; the surface consisted of loose, sandy soil. By the time FACE investigators traveled to the scene, the dirt road had been regraded. At the location of the incident, about 1/2 mile up the access road, the right side of the road dropped off into a ravine of trees; on the left was a steep densely forested bank.

The victim transported his welding equipment to the worksites in a Chevrolet 300 series, two-wheel drive, pickup truck weighing approximately 4300 pounds. The welding equipment, a Lincoln SA 200 series, weighed an additional 1200 pounds and occupied most of the truckbed.

Machinery used to pull the pickup out of the ravine was a Caterpillar pipelayer model 561D (105 HP), weighing approximately 35,000 pounds and having a sideboom length of 15 feet. The dozer-like treads have a length of 78" on the ground. It was manufactured in 1982 and obtained by the company in 1984. The company reports regular maintenance inspections are performed on their heavy equipment before using it on a new site (a contracted job is completed approximately every 2-3 weeks and the equipment is brought back to the company and inspected between jobs). This pipelayer had been inspected within the week prior to the incident. Fluid and fuel levels are checked every day at the site before the equipment is used; levels were at appropriate quantities on the day of the incident according to the company's vice president.

On 28 July 1995, the workers met at the company office to begin the third day of work at this site. As was their usual practice, the crew of 8 workers met at the office at 6am, then drove to the construction site, in one or two vehicles, to begin work by 7am. The victim, the welder's helper, and the operator left first for the site that morning in the victim's pickup truck to be followed shortly after by the foreman and the other workers. The foreman reminded them before they left not to attempt to drive the pickup truck up a particular incline on the access road, but to use the pipelayer with the sideboom that was parked at the top of the hill to pull up the truck.

As the victim drove to the site he attempted to drive up the hill, which had a maximum slope of approximately 32 degrees, without using the pipelayer equipment for assistance. The weight in the back of the truck caused the front end to lift off the ground, the victim lost control, and the truck went over the right embankment, rolling over three times into the ravine before coming to rest on its side against some trees. All three occupants were able to walk away from the incident and get back up to the road. The operator drove the pipelayer part way down the hill, attached a 5/8" wire rope from the sideboom to the truck hitch, and pulled it back up to the roadway. The pipelayer was left idling on the hill at half throttle, angled slightly toward the left bank, while the wire rope from the sideboom (which was then wrapped around a hook on the lower front of the pipelayer) remained attached to the hitch with the truck facing downhill and all four wheels on the ground. According to the vice president of the company, the mechanical parking brake on the pipelayer had been applied.

Approximately 10-15 minutes elapsed while the three men were collecting debris that had been thrown from the truck, when they noticed that the pipelayer was beginning to move down the hill. For unclear reasons the engine on the pipelayer shut down and the unmanned machine began to move downhill with increasing speed. It ran into the left bank (as viewed from the bottom of the hill) then hit the left rear of the pickup truck as it came down the hill, knocking the cab of the truck over the right embankment and severing the cable attached to the hitch. The victim yelled to the others to get out of the way. The pipelayer continued down the hill passing the truck and running over the victim before hitting the left bank and coming to a stop. The other two workers escaped without injury and began to run down the road for help when they were met by the foreman and the rest of the crew driving to the site.

Rescue personnel were dispatched after receiving a call from the foreman at 7:24am. State police arrived first on the scene at 7:36am, followed by EMS, the county coroner, and the company insurance adjuster. The victim was pronounced dead at the scene.

CAUSE OF DEATH

Coroner's report states the cause of death as being blunt force (crush) injuries of head and trunk with traumatic subtotal evisceration of the thoracic abdominal organs; all took place in a matter of seconds. An autopsy was performed. Toxicology report was negative for blood alcohol or drug content.

RECOMMENDATIONS/DISCUSSIONS

Recommendation #1: Operators should be aware of limitations of the equipment.

Discussion #1: It is important to consult the operations manual to determine limitations of the equipment. In this incident, the pipelayer was being operated beyond its limitations on this slope while bearing the weight of the attached truck and welding equipment. An incline of 32 degrees is considered to be an extreme slope and could cause the machinery to become unbalanced and unsafe, even with the mechanical parking brake applied. In addition, uneven or loose dirt surfaces and excessive loads can decrease the stability of a vehicle with track-like treads causing it to become unbalanced and increasing track slippage. The vehicle should not have been left idling on a steep slope while holding the weight of the truck; both actions put the pipelayer in the position of operating beyond its recommended capacities. Consulting the operators manual for slope and weight limitations would help assure that the equipment would be operating under safe conditions.

Recommendation #2: Equipment should not be operated for purposes other than its intended use.

Discussion #2: The pipelayer in this incident was being used for operations other than what the vehicle was intended for. This equipment should not have been used to pull the pickup truck out of the ravine as it was not in the scope of its intended purposes. Operating equipment under conditions other than what it was designed for creates a safety hazard and puts the operator and other workers at risk for injury. The employer in this incident conducts regular safety meetings with the employees, stressing the importance of using equipment as intended and operating it in a safe manner.

Recommendation #3: Company policies should address the issue of operating equipment only for intended purposes and provide strict safety guidelines.

Discussion #3: The company's policy book has been under revision and at this time the final draft is not yet available to state the exact policy regarding this topic.

REFERENCES

Caterpillar Performance Handbook; Caterpillar Inc., Peoria, Illinois; October 1988.