FACE 98-AK-018

Ironworker Crushed Between Crane Outrigger and Back of Stretch Deck Trailer

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SUMMARY

A 51-year-old ironworker was crushed when he went to unhook a chain between a mobile crane and a stretch deck trailer. The victim and three co-workers were assisting a tractor-trailer driver to stretch and pin the trailer. Because they were having some difficulty stretching the trailer using only dunnage (a length of wood to block the wheels) in front of the rear wheels, the end of the trailer was chained to the crane's extended outrigger to prevent the rear section from moving. After the trailer was stretched, the dunnage was repositioned for the alignment and placement of locking pins. As the tractor was moved backwards, pushing the front and rear sections together, the dunnage became lodged under the wheels. With the trailer sections pinned in place, the driver exited the cab to discuss the load and the position of the trailer with the victim. There was concern that the trailer was too close to load. The driver noticed the position of the dunnage under the wheels and called to the group of workers standing to the side of the trailer that he needed to roll the trailer back. As the driver entered the tractor cab, the victim walked between the crane and the trailer to remove the chain. The tractor-trailer rolled back, crushing the victim between the crane's outrigger and the trailer. Co-workers went to the rear of the trailer and called to the driver to move the trailer forward. Emergency medical services were called immediately after the incident and transported the victim to a nearby medical center. The victim died later that day.

Based on the findings of the investigation, to prevent similar occurrences, employers should:

Ensure that workers are able to recognize and avoid hazardous situations and be able to effectively warn others of potential hazards;
Install back-up alarms on all motor vehicles and equipment where the operator's vision is restricted;
Require the use of helpers whenever backing and re-positioning tractor-trailers or other trucks;
Consider routinely evaluating driving, loading, and unloading practices.

INTRODUCTION

At approximately 2:50 PM on June 30, 1998, a 51-year-old male ironworker (the victim) was crushed when he walked between a mobile crane and a tractor-trailer. On June 30, 1998, the Alaska Department of Labor (AK-DOL) notified the Alaska Division of Public Health, Section of Epidemiology. An investigation involving an Injury Prevention Specialist for the Alaska Department of Health and Social Services, Section of Epidemiology ensued on the same day. The incident was reviewed with AK-DOL officials. Anchorage Police Department, Medical Examiner, and AK-DOL reports were requested.

Two companies were involved in this incident: a steel erection company and a commercial freight company. Both were privately owned and had been in business for more than 25 years. The steel erection company had 18 permanent employees and employed an additional 35 seasonal full time workers for the peak construction period (normally April through October). Approximately 80% of the seasonal employees were ironworkers who routinely moved between companies as positions became available throughout the season. The victim had more than 20 years experience as an ironworker and had been working for the company for 6 ½ weeks as a foreman. He had also been employed by the company during the 1995 and 1996 construction seasons.

The steel erection company had a written safety program that detailed specific work practices and employee conduct at the worksite. All employees attended an orientation to the company's safety program upon initial hire. Since the company normally contracted their services to a general contractor, employees were also required to attend all safety training classes conducted by or on behalf of the general contractor. In addition, the individual crews conducted weekly toolbox meetings.

The commercial freight company had 80 employees of which 20 were commercial truck drivers. In addition to moving residential and office furniture and equipment, the company also transported industrial freight including construction equipment, materials, and supplies. The driver in this incident had a current commercial driver's license and had 10 years experience as a commercial driver. He had been employed by the company for nearly 10 months and had been assigned to haul mixed freight to various locations throughout the state. Freight transportation training was primarily on-the-job. The company had a written safety program and conducted monthly safety meetings for all employees. Monthly safety topics included vehicle backing procedures and general truck safety. Drivers also participated in daily planning meetings to discuss scheduling and any other problems and concerns.

INVESTIGATION

The incident occurred in a paved yard adjacent to the steel erection company. The yard was used to store equipment and materials, such as sections of crane boom, when not in use. The commercial freight company was contracted to transport these materials to various worksites. Weather was sunny and was not considered a factor in the incident.

On the day of the incident, several sections of crane boom needed to be transported to a worksite. The victim and three co-workers (two other foremen and a project manager) were assigned to work in the yard to help load sections of crane boom onto a trailer.

The victim was the lead man for this job. A mobile crane with its outriggers fully extended was to be used to lift the boom sections onto the trailer. Several sections of boom were on the ground in front of the crane. The stretch deck trailer was positioned with its back end adjacent to the side of the mobile crane and aligned with the crane's outrigger (Figure 1).

The trailer was an extendable or stretch deck trailer (Figure 2). This type of trailer has front and back sections that can be drawn apart to accommodate oversized freight. The tractor-trailer was not equipped with a back-up alarm. Regular and wide-angle mirrors were attached to both sides of the tractor cab. The angle of the mirrors allowed the driver to view the side and rear corner areas but not directly behind the trailer. The tractor cab did not have a rear window since the trailer or its load would normally block the driver's line of sight.

To hold 50-foot sections of crane boom, the ends of a stretch deck trailer needed to be drawn apart to 48 feet (maximum length). Having tried unsuccessfully to pull the trailer sections using dunnage (a length of 4"x4" wood) to block the rear wheels of the trailer, the driver suggested that the trailer be secured to the crane to hold the rear section of deck more securely. A chain was wrapped around the crane's extended outrigger and attached to the rear of the trailer (Figure 3). The dunnage, approximately 4 feet long, was still in place in front of the left rear trailer wheels. After the deck was completely stretched, the holes for the locking pins were found to be misaligned. The dunnage was then repositioned in back of the wheels, blocking backward motion of the rear trailer bed. The tractor then pushed the front section of the trailer back to align the holes. The workers were able to place the pins, using a tool to pound one of the pins into position. With this accomplished, the workers moved away from the trailer. Two workers and the victim were standing approximately 15 feet from the right rear corner of the trailer; the fourth worker went to return the tool. The driver had exited the tractor cab to discuss

the loading of the boom sections with the victim. The trailer was 1 ½ to 2 feet from the crane and may have been too close to the crane for loading. The chain, having been pulled tight while stretching the deck, was now slack after the tractor-trailer had rolled back to align the holes for the pins. However, the tractor-trailer had moved back far enough to trap the dunnage under the wheels. The driver, near the left (driver's side) front corner of the trailer, noticed the dunnage under the leading set of rear wheels, causing the trailer to be slightly tilted. He called to the three workers in the yard that he was going to move the trailer back (to remove the dunnage). He then entered the tractor cab. The workers heard the driver's remark about moving the trailer but did not understand that he intended to move the trailer backward. The victim went between the trailer and the crane to remove the chain. After the driver entered the tractor cab, the fourth worker came back and joined the group of workers. The driver saw three workers in the yard in the cab's right side mirrors. The victim's position behind the trailer could not be seen in either of the tractor cab's side mirrors. As the driver backed off the dunnage, the group of workers yelled a warning to the victim. The victim was pinned between the crane outrigger and the back of the trailer.

The workers immediately called to the driver to pull forward. Two workers assisted the victim as one worker went to the company office to call 911. Emergency medical services were dispatched at 2:54 PM, arriving at the site 6 minutes later. The victim was transported to a local medical center at 3:13 PM. He died later that same day.

CAUSE OF DEATH

The medical examiner's report listed the cause of death as massive crush injuries to the pelvis.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure that workers are able to recognize and avoid hazardous situations and be able to effectively warn others of potential hazards.

Discussion: In this incident, the ironworker walked behind the trailer to unhook a chain. Knowing the driver was about to move the trailer, he placed himself in an extremely hazardous position. The use of a helper or signal person to guide an operator is common practice in many industries. However, when a helper or signal person is not being used, workers should **always** assume the area surrounding vehicles or equipment is hazardous. Activities in blind areas must be understood and agreed upon before the vehicle or equipment operator enters the operator's cab.

Good communication skills are essential in all job situations. On-the-job communication includes discussions, statements, and advisements before, during, and after work duties. These communications need to be clear and concise in order to advise or alert co-workers or other persons at the worksite to actions that could jeopardize the performance and/or efficiency of their job duties or that could cause potential injury. Employers should consider adding communication skills in initial safety orientation classes. Suggested techniques to aid in successful communication include—

1) Make eye contact with the person or persons you are advising
2) Use the name of the person to whom you are speaking
3) Require a response before taking action

Recommendation #2: Employers should install back-up alarms on all motor vehicles and equipment where the operator's vision is restricted.

Discussion: The tractor-trailer in this incident was equipped with regular and wide-angle

mirrors that extended several inches from both sides of the cab. While these types of mirrors improve visibility from the driver's position to prevent damage to materials or equipment or injury to individuals near the trailer, a significant blind area is present at the rear of the trailer. Back-up alarms are designed to alert pedestrians and other workers out-of-sight of the driver that the vehicle or equipment is moving in reverse, allowing time for them to retreat from the vehicle's path. Therefore, it is recommended that all motor vehicles and equipment that restrict the operator's vision should be equipped with a back-up alarm.

Recommendation #3: Employers should require the use of a helper or signal person whenever backing or re-positioning tractor-trailers or other trucks.

Discussion: Backing a vehicle is always dangerous, and large or oversized vehicles have large blind areas, particularly behind the vehicle. 29 CFR 1926.601(b)(4)(ii) requires the use of a helper or guide if the driver's view is blind in any area to the rear and the vehicle is not equipped with a back-up alarm or the alarm cannot be heard above background noise. Employers should consider using a helper or signal person **whenever** backing a large or oversized vehicle or motorized equipment with a blind area. This will help prevent damage to surrounding equipment, materials, or structures and avoid injury to people who may be hearing-impaired. The helper should stand near the rear of the vehicle where the driver can see the helper. Hand signals should be used to give instructions. Signals should be understood by both the driver and helper since this may be the only way to communicate over noise at the worksite or if hearing protection is being worn.

Recommendation #4: Employers should consider having a "ride-along" program to evaluate driving, loading, and unloading practices.

Discussion: The majority of vehicle incidents are due to driver error or poor operating practices. A "ride-along" program provides an effective means to evaluate driving, loading, and unloading. Employers should consider adding random operator safety checks in their fleet safety program to establish competency and monitor skill levels and to help develop strategies for future prevention efforts.

References

Alaska Dept. of Public Safety, Division of Motor Vehicles. Commercial Driver License Manual. Anchorage. Nov. 1997.

National Safety Council. Accident Prevention Manual for Business & Industry: Administration & Programs. Tenth Edition. Chicago IL; 1992.

Office of the Federal Register: Code of Federal Regulations, Labor 29 Part 1926. Washington, DC: U.S. Government Printing Office, 1996.

Safe Equipment Transport. International Union of Operating Engineers. Videocassette. Video Information System Training Association, Inc. 1995.

Michael Beller, MD, MPH
Medical Epidemiologist
Division of Public Health
Alaska Dept. of Health & Social Services

Deborah Choromanski, MPH
Occupational Injury Prevention Program Manager
Section of Epidemiology
Alaska Dept. of Health & Social Services

Fatality Assessment and Control Evaluation (FACE) Project

The Alaska Division of Public Health, Section of Epidemiology performs Fatality Assessment and Control Evaluation (FACE) investigations through a cooperative agreement with the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR). The goal of these evaluations is to prevent fatal work injuries in the future by studying the working environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

Additional information regarding this report is available from:

Alaska Occupational Injury Prevention Program
Section of Epidemiology
PO Box 240249
Anchorage, AK 99524-0249
Phone (907) 269-8000
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