A fitter/welder for an elbow fabricator in Texas died when he was struck by a 9,300 lb. elbow when a support stand was being removed.

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SUMMARY

A 27-year-old, male fitter/welder for an elbow fabricator, died when he was struck by a 9,300 lb. elbow when a support stand was removed. The victim and a co-worker had been welding work on a large steel elbow. The victim had completed the job and was going to move the elbow to the next workstation. The elbow was being supported by chains attached to an overhead crane and two stands which were tack welded to the base of the elbow. The victim cut one stand free and then after cutting the second stand free, the elbow rolled over on top of him, and crushed his head. The coworker used the controls to lift the elbow off the victim. Emergency medical services (EMS) were notified at 7:40 p.m. and arrived at 7:42 p.m. The victim was pronounced dead at the scene.

The TX FACE Investigator concluded that to reduce the likelihood of similar occurrences, employers should:

Design and build a cradle with lifting eyes for the elbow, to be used while welding or other work is being performed.

Perform job safety analysis (JSA) for supervisors to use as guidelines for completing this task and for training workers.

INTRODUCTION

On June 26, 1998, a 27-year-old, male fitter/welder (the victim), died when he was struck by a 9,300 lb. elbow after a support stand was removed. The TX FACE project officer was made aware of this incident by the Occupational Safety and Health (OSHA) Regional office. On October 22, the TWCC FACE project officer visited the incident site and interviewed the employer. Photographs of the incident scene were provided by the employer.

The employer was an elbow fabricator that employed nine workers, two of whom were of the same occupation as the victim. At the time of the incident one other employee, a helper, was at the site and was directly involved.

The company had an unwritten safety program managed by a designated safety director. Safety meetings were conducted every six weeks.

New hire training was seldom conducted because most workers who were hired are experienced. Those who did not have sufficient experience received training on the job (OJT). They were assigned to work with an experienced fitter/welder until they had acquired sufficient experience. Task-specific training was conducted in the classroom every six weeks with topics chosen by the

workers or the owner.

The victim had been a welder for six years. He took raw material and constructed elbows and other pieces. Prior to the incident, the victim had been approved by a welding laboratory to perform the type of work he was assigned.

The employer incorporates pre-employment physicals and drug screening when hiring new employees. This was the employer's first fatality. The company has been in business for 15 years.

INVESTIGATION

This was the third time workers involved in the incident had performed this type of work. The victim and a coworker, a helper, were welding on a large steel elbow that weighted 9,300 lbs. They were attaching a header (external duct work) and internal supports. The elbow was shaped like an ellipse. The inlet/outlet measured 5 ½ feet by 7 feet.

The elbow was moved from one location to another by an overhead crane. Four lenghts of chain (spreader chains) were attached to a metal D-ring. The D-ring was hung on the crane's hook and two lengths of chain were connected to the elbow. They were wrapped around an internal support and a header. The other two lengths were left hanging

The elbow was supported by two metal sawhorses, approximately two feet high, tack welded to the lower portion on the backside of the elbow. The stands maintained the elbow in an upright and stabilized position when the elbow was set on the ground. The edge of one outlet touched the ground when in this position.

After the victim finished attaching the header, he instructed the helper to rig the chains to the elbow and crane so that it could be moved to the next work station. The victim then raised the elbow slightly to determine if it was properly rigged. The victim decided he was not satisfied with the rigging and set the elbow back down and told the helper to adjust the rigging. The helper adjusted the rigging and the victim raised the elbow slightly so he could determine if the weight of the elbow was being supported by the overhead crane instead of the stands.

The next step in the process was to remove the stands. The victim apparently felt that the elbow was adequately supported by the overhead crane and that the stands could be safely removed.

The victim began removing the stands. He cut one stand free with a torch without problem. However, when he cut the second stand free, the elbow rolled over onto him, crushing his head.

The helper saw what had happened and immediately grabbed the hand-held crane controls. He raised the elbow off the victim and moved it approximately ten feet away and set it down. EMS personnel were immediately notified. Upon their arrival they observed the victim had a crushed skull and the coroner was contacted. The victim was pronounced dead at the scene.

CAUSE OF DEATH

The autopsy report stated the cause of death was from massive cranio-cerebral injuries due to blunt force trauma.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should design and build a cradle with lifting eyes for the elbow to be used while welding or other work is being performed.

Discussion: When stands are attached or removed the elbow must be tilted forward so the edge of one outlet touches the ground. The stands are then attached to the lower portion on the backside of the elbow. This procedure keeps the elbow in an upright and stabilized position, but it places the worker in the direct path of the elbow should its means of support be removed or fail.

There are two possibilities to explain why the elbow rolled when it appeared to the victim as though it was fully supported by the crane. One explanation is that the victim may have lowered the elbow to a point where the stand was supporting the weight of the elbow. A second possible explanation is that the chains either slipped or moved where they were attached to the elbow. Whatever the case might be, it is clear that the elbow was not adequately supported when the second stand was removed.

Placing the elbow in a cradle would alleviate the possibility of a worker being crushed. The supporting structure would be the cradle instead of the stands that are attached and removed. Attachment points on the cradle would need to be located so workers can reach them without exposing themselves to a suspended load. Also, attaching lifting eyes that chains can be attached to would prevent chains from slipping.

Recommendation #2: Employers should perform job safety analysis (JSA) for supervisors to use as guidelines for completing a task and for training workers.

Discussion: In this incident, the hazard of being crushed and the means to prevent it may have been identified, resulting in a different method of securing the elbow. A JSA forces those conducting the analysis to view each operation as part of a system. In so doing, each step in the operation is assessed while consideration is paid to the relationship between steps and the interaction between workers and equipment, materials, the environment, and other workers.

Other benefits include identifying hazardous conditions and potential accidents, providing information with which effective control measures can be established, determining the level of knowledge and skill as well as the physical requirements that workers need to execute specific tasks, and discovering and eliminating unsafe procedures, techniques, motions, positions and actions. A JSA can help shape decisions correctly and lead to fulfillment of the desired objectives.