TO: Director, National Institute for Occupational Safety and Health

FROM: California Fatality Assessment and Control Evaluation (CA/FACE) Program

SUBJECT: A Laborer Dies When He is Struck By an Exploding Forklift Multi-Piece Rim

SUMMARY
California FACE Report #10CA001

A 27-year-old laborer died when a forklift multi-piece rim exploded as he was changing the tire. The victim was an employee of an employment agency assigned to work at a tile manufacturing company as a general laborer. The supervisor in the tile manufacturing company who assigned the victim the task of changing the tires was not aware of the hazards or proper procedures for changing tires on multi-piece rims. The employment agency was unaware that the tasks assigned to their general laborers at this company included changing tires on multi-piece rims. The victim had not received adequate training on changing tires on multi-piece rims. The victim, along with a co-worker, assembled the rim with a new tire and tube and inflated the tube when they noticed the tube was pinched between the two pieces of the rim. The rim exploded when they began to disassemble the rim before deflating the tube. The CA/FACE investigator determined that, in order to prevent future incidents, manufacturers who hire laborers from employment agencies should ensure that:

- Laborers are not assigned skilled tasks such as changing tires on multi-piece rims.
- Employment agencies are notified of changes in work assignments of their employees.
- A job hazard analysis is performed by a competent person trained and qualified to recognize safety hazards.

In addition, employment agencies, as part of their Injury and Illness Prevention Program (IIPP), should ensure that:

- Audits and inspections are performed at customer facilities on a more frequent than annual basis to ensure that safe work processes are followed.

INTRODUCTION

On Thursday, January 21, 2010, a 27-year-old laborer died from injuries he received on Monday, January 18, 2010 at approximately 8:30 a.m., when changing the tire and tube mounted on a forklift multi-piece rim. The CA/FACE investigator was notified of this incident on February 1, 2010, by the Office of the Department of Investigations of the Division of Occupational Safety and Health (Cal/OSHA). On February 4, 2010, the CA/FACE investigator inspected the incident site and interviewed the manager of the facility, the victim's supervisor, and a co-worker. Copies of the victim's employment application, training records, and IIPP were obtained from the employment agency and the tile manufacturer. A copy of the police report on this incident was also obtained from the local police department.

The victim was a high school graduate. His work history consisted of six separate entry level jobs that included general labor, fast food service, and delivery driver. He had been employed by the employment agency for one year and had been working at the tile company for nine months. He performed general tasks such as stacking boxes, moving tile, and sweeping floors. The employer of the victim was an employment agency that provided employees for a range of job positions including short and long term temporary assignments, direct hire, and professional placement. The company had been in business for over 38 years and had more than 300 locations in 30 states. The branch office from which the victim was hired had five administrative employees.

The employment agency had a complete, written IIPP with sections on communication and hazard assessment. The employment agency had a training program that covered instructions on general and job-specific safety and health practices. The employment agency trained their employees' in general safe practices before sending them out to work for their customers. The IIPP stipulated that employees would receive specific training from the businesses they would work for through the agency. The employment agency had documentation showing the victim received training on general and specific labor safety practices. However, he did not receive training on changing forklift tires on multi-piece rims, prior to his placement at the tile company.

The company where the victim worked was a manufacturer of decorative handmade stone, glass, and metal tile for home use. The tile company had been in business for 18 years and had occupied the facility where the incident occurred for three years. They had 88 employees, 34 of whom worked at the incident facility. The tile manufacturer had an IIPP that was revised in January 2010 and included policies and procedures related to warehouse work and tile manufacturing. There were no specific written policies or procedures related to changing forklift tires. The tile manufacturer had an informal training program that was not documented. The workers at the tile manufacturing company received on-the-job-training (OJT) from experienced workers and their supervisors. This training was not documented. The supervisor who trained the victim had not himself received training nor had his competency formally been evaluated in changing multi-rim tires.

INVESTIGATION

According to the victim's supervisor, the tile company utilized their own forklifts and pallet jacks to move their product. The forklifts often developed flat tires from nails left by a nail manufacturer that previously occupied the facility. The flat tires were repaired in-house by the laborers and were not sent to a repair service. On Monday, January, 18, 2010, the victim and a co-worker were changing the flat tires on a forklift. According to the co-worker, they assembled and inflated one wheel assembly with no problems. They took a tube, inserted it into a second tire, and partially inflated it to round it out. They took a multi-piece rim and assembled it within the tire. The co-worker stated that the victim placed the assembled tire and rim on top of two old tires so he didn't have to bend down so far. They fully inflated the tube and noticed that it was pinched between the rim parts. As the co-worker turned to get the tool to deflate the tire, the victim took the air impact gun and started to disassemble the rim without deflating the tube. The co-worker heard the air impact gun activate and then an explosion. The co-worker turned and saw the victim fall to the ground.

The manager and supervisor were in a nearby office when they heard the explosion. They both rushed out of the office and found the victim lying next to the forklift. The manager immediately called 911. The fire department and paramedics arrived within minutes of the call, and transported the victim to a local hospital. The victim was pronounced dead on Thursday, January 21, 2010.

CAUSE OF DEATH

The cause of death according to the death certificate was blunt head injury.

RECOMMENDATIONS / DISCUSSION

Manufacturers should ensure that:

Recommendation #1: **Laborers are not assigned skilled tasks such as changing tires on multi-piece rims.**

Discussion: In this incident, the tile manufacturer used laborers from a local employment agency to perform tasks such as yard duties, janitorial work, and lifting heavy objects. Flat tires on forklifts were changed onsite. The victim in this case had changed tires in the past but had never received proper training in multi-piece rims. The victim attempted to dissemble the wheel before deflating the tire. This will always result in an explosion in a fully inflated tire. The first principle in tire assembly is to fully deflate the tire before performing any work. Because of the extreme danger and severe consequences of improper handling of tires with multi-piece rims, employees assigned to change this type of wheel should receive specific training on each multi-piece rim produced by a different manufacturer. This training should be verified through testing and noted in the worker's personnel or training file. These workers did not have the technical skills necessary to perform the job safely, which led to the victim's death. The task of changing the flat tires on a forklift with multi-piece rims required skills beyond the

scope of a general laborer. Had the victim not been assigned this task, this incident would have been avoided.

Recommendation #2: **Employment agencies are notified of changes in work assignments of their employees.**

Discussion: In this incident, the laborers employed by the employment agency were assigned to a tile company to perform unskilled labor jobs. When the customer relationship was initially established and prior to staffing, the safety director from the employment agency did a hazard assessment of the tile company and evaluated the workplace hazards for the laborers. After staffing, the laborers were then assigned the task of changing forklift tires, which was not part of their original assessment. This change should have been communicated to the employment agency so a hazardous risk and safety evaluation could have been conducted at the company by the employment agency to determine any special needs or qualifications of the assigned employee. Had the employment agency been informed of the change in work assignment of their laborers, a hazard assessment would have been conducted by the employment agency which would have excluded the laborers from the task of changing the forklift tires, thereby preventing this incident.

Recommendation #3: **A job hazard analysis is performed by a competent person trained and qualified to recognize safety hazards.**

Discussion: In this incident, the hazards involved with changing a multi-piece rim were not identified. The supervisor showed the laborers how to remove, disassemble, and reassemble the forklift tires that were flat, but was not aware of and did not address the hazards and the proper procedures needed to do the job safely. A supervisor in charge of assigning work to employees should have the ability to anticipate and identify the hazards associated with every job function. If the hazards aren't anticipated or recognized, then it is impossible to prevent or control them. A job hazard analysis is a technique that focuses on job tasks as a way to identify hazards before they occur. It focuses on the relationship between the worker, the task, the tools, and the work environment. After hazards are identified, then control measures are developed and applied. Had the supervisor been trained on how to perform a job hazard analysis, he would have recognized the safety hazards and skilled procedures needed to do this job and not assigned unskilled laborers to this task, thereby avoiding this incident.

In addition, employment agencies, as part of their Injury and Illness Prevention Program should ensure that:

Recommendation #4: Audits and inspections are performed at customer facilities on a more frequent than annual basis to ensure that safe work processes are followed.

Discussion: In this incident, a hazard assessment of the tile company was performed by the employment agency when they initially became a customer. There were no

documents presented to verify another inspection, audit, or assessment had been conducted after the initial inspection. According to the employment agency's IIPP, a hazard assessment would be conducted at a customer's facility when:

- a relationship is initially established with a customer;
- new hazards are introduced to their employees;
- previously unidentified hazards are recognized;
- an injury or illness occurs;
- reassigning employees to tasks for which a hazard evaluation has not been previously conducted; or
- workplace conditions warrant an inspection.

Risk assessments were also to be conducted on an annual basis for all active accounts. Had an audit, inspection, or safety assessment been conducted more often, this fatality might have been avoided.

References:

General Industry Safety Orders Subchapter 7. Group 2. Safe Practices and Personal Protection Article 7. Miscellaneous Safe Practices §3325. Tire Inflation §3326. Servicing Single, Split and Multi-Piece Rims or Wheels. .

NIOSH self-inspection checklist
(http://www.cdc.gov/niosh/docs/2004-101/chklists/n58rim~1.htm)

Alaska Case Report: 03AK006
(http://www.cdc.gov/niosh/FACE/stateface/ak/03ak006.html)

NIOSH-Issued Publication (http://www.cdc.gov/niosh/docs/99-110/)

Servicing Single-Piece and Multi-Piece Rim Wheels booklet
(http://www.osha.gov/Publications/osha3086.pdf)

DIR DOSH Publication (http://www.dir.ca.gov/dosh/dosh_publications/tb_wheels.pdf)

http://www.tireindustry.org/pdf/osha_Rim%20Matching.pdf

EXHIBITS:

Exhibit 1. A forklift multi-piece rim and tire assembly similar to the one involved in the incident.

Exhibit 2. The forklift involved in the incident.

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November 4, 2010

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Public Health, in cooperation with the Public Health Institute and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations of work-related fatalities. The goal of the CA/FACE program is to prevent fatal work injuries. CA/FACE aims to achieve this goal by studying the work 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. NIOSH-funded, state-based FACE programs include: California, Iowa, Kentucky, Massachusetts, Michigan, New Jersey, New York, Oregon, and Washington.

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Additional information regarding the CA/FACE program is available from:

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