TO: Director, National Institute for Occupational Safety and Health

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

SUBJECT: A Packer in a Manufacturing Facility Dies When He is Struck by a Pipe that Rolled off a Storage Rack.

SUMMARY
California FACE Report #07CA003

A 54-year-old packer in a manufacturing facility died when a pipe rolled off an overhead storage rack and struck him on the back of the head. The pneumatic stops that usually hold the pipes in place were not up when the incident occurred. The company's Injury and Illness Prevention Program (IIPP) was printed in English, and the victim spoke Mandarin and some English. The CA/FACE investigator determined that, in order to prevent future occurrences, employers, as part of their Injury and Illness Prevention Program (IIPP), should:

- Ensure that safety measures are in place to prevent pipes from rolling off a storage rack to a bundling table prior to anyone entering the area.
- Develop**,** implement, and enforce a written hazardous energy control program for the area under the pipe storage rack.

INTRODUCTION

On May 7, 2007, at approximately 2:00 p.m., a 54-year-old packer in a warehouse died when he was struck on the back of the head by a pipe that rolled off a storage rack. The CA/FACE investigator learned of this incident on May 10, 2007, from the legal office of the Division of Occupational Safety and Health (Cal/OSHA). Contact with the victim's employer was made on June 4, 2007. On July 10, 2007, the CA/FACE investigator traveled to the company that employed the victim and interviewed the company's safety coordinator and other employees in the warehouse. Photographs of the incident scene were taken.

The employer of the victim was a national company that manufactured plastic polyvinyl chloride, polyethylene, and cross-linked polyethylene pipes in varying width, length, and thickness. The company had 13 plants throughout the United States and had been in business for 21 years. The plant where the incident occurred had 80 employees, 40 of whom were at the job site when the incident occurred. The victim had worked for the company for two years as a packer. The victim was born in Taiwan and had been in the United States for three years. The victim was a high school graduate and spoke Mandarin and some English.

The company had a written IIPP in English, and it was last updated in 1995. The company used interpreters when needed to communicate safety and training material to employees. Safety meetings were held on a monthly basis and were documented. The company's training program included each employee receiving one and one half days of safety orientation/training upon hire, and then they had to pass a written 54-question test that included questions on all aspects of the work involved. Specific training related to the job was achieved through on-the-job training (OJT) and administered through interpreters. The safety program did not cover all the details of the job the victim was performing. Annual evaluations were performed by the employee managers and kept on file. The documented evaluation during the victim's first year of employment indicated that he was proficient in his work duties.

INVESTIGATION

The site of the incident was a warehouse that manufactured and stored plastic pipe. The pipe involved in this incident was 20 feet long, had a diameter of 18 inches, and weighed approximately 645 pounds. The pipe was formed and then fed onto a turntable behind the pipe storage rack. The turntable would automatically raise the pipe up to the pipe storage rack where the pipe would roll onto the rack due to gravity. The pipe storage rack was designed to store the pipe until it was transferred onto a unitizing table where the pipe was packaged. The pipe storage rack was equipped with pneumatic stoppers that prevented the pipe from rolling off. The stoppers were lowered by manually activating a spring-loaded handle connected to a control valve. When the pipe needed to be transferred from the pipe storage rack to the unitizing table, a packer would hydraulically raise the unitizing table up to the pipe storage rack, and then activate the stopper handle that would lower the pneumatic stoppers. The pipe would then roll onto the unitizing table. The packer would let go of the handle and it would return back to its original position in order for the pneumatic stoppers to return to the upright position.

The incident was not witnessed by any employees in the warehouse, but it was captured on video surveillance. The video depicted the activity in the area before, during, and after the incident. The video also showed that the stoppers were not always in an upright position when the pipes were fed onto the storage rack. It also showed pipes falling down onto the unitizing table on some occasions.

On the day of the incident, the victim was performing his normal duties as a packer. He bundled the pipe using wood strips and banning material, and then stored them in their correct locations in the warehouse using a forklift. Before moving the pipe, the victim also checked the stencil markings on the pipe to ensure their clarity. If not clear, he re-stenciled the pipe before binding them and moving them off of the unitizing table. Surveillance videos taken at the time of the incident showed that the victim had lowered the unitizing table after three pipes rolled onto it from the storage rack. The pneumatic stoppers were not in the up position and it is not known whether or not the victim was aware of this. After examining the pipes, he realized he needed to re-stencil one of the pipes, and went under the storage rack and leaned forward over the pipe to do so. At

the same time, the automatic system behind him fed another pipe onto the storage rack. The pneumatic stoppers were not in an upright position to stop the pipe's movement, and it rolled off the storage rack, fell downward striking the victim in the back of the head, and then rolled onto the unitizing table. The surveillance video showed that approximately 35 minutes elapsed before the victim was discovered. Once the victim was discovered by co-workers, they rendered aid by checking for vital signs and placing a blanket over him, and called 911. The paramedics and fire department arrived and pronounced the victim dead at the scene.

CAUSE OF DEATH

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

RECOMMENDATIONS / DISCUSSION

Recommendation #1: Ensure that safety measures are in place to prevent pipes from rolling off a storage rack to a bundling table prior to anyone entering the area.

Discussion: The pipe was gravity fed onto the pipe storage rack. Therefore, a stopping device was necessary to prevent the pipes from rolling off the other end. In this particular case, the storage rack was equipped with pneumatic stoppers. Video surveillance showed that pipes would occasionally roll off the rack and onto the bundling table because the stoppers were jammed or stuck in the down position. Daily or pre-shift testing of the system to ensure that the stoppers are operating properly, would be a safety measure that could be taken to ensure employee safety. Additional safety devices, such as a sensor system that alerts the operator whenever the stoppers fail to activate and shuts down the turntable feed system so pipe are not fed onto the pipe storage rack, would also ensure employee safety. Changing out the old pneumatic valves that operate the stoppers to a push button type that is spring loaded to the open position would also help ensure the stoppers are in the correct position. Manually installed stoppers are also an alternate safety measure that will stop pipes from rolling off the rack.

Recommendation 2: Develop, implement, and enforce a written hazardous energy control program for the area under the pipe storage rack.

Discussion: In this particular case, the employees were working with a hazardous energy that was not properly identified, i.e., the rolling pipes on the pipe storage rack. Employers who have employees that work with hazardous energy should develop and implement a written hazardous energy control program that identifies and labels all hazardous energy sources, and de-energizes, isolates, blocks, and/or dissipates all forms of hazardous energy before work begins. The employer should identify the activities that place the workers in hazardous situations and go through a stepwise program to first try to eliminate the hazard entirely. If that is not possible, the employer needs to implement engineering or administrative controls that will abate the hazard.

Employers who use surveillance video in their workplace may want to consider reviewing the tapes to identify new and ongoing hazards that may not have been identified during normal inspections. In this particular case, the victim was stenciling by hand the pipes that did not come out clear. Better maintenance or replacement of the automatic stencil machine could be the engineering control. Having the stenciling operation performed away from the pipe storage could be the administrative control.

REFERENCES:

California Code of Regulations, Subchapter 7. General Industry Safety Orders:
§3203. Injury and Illness Prevention Program.
§3241. Live Loads.
§3314. The Control of Hazardous Energy for the Cleaning, Repairing, Servicing, Setting-Up, and Adjusting Operations of Prime Movers, Machinery and Equipment, Including Lockout/Tagout.
§3942. Type of Guarding Required.

NIOSH Publication No. 99-110: NIOSH Alert: Preventing Worker Deaths from Uncontrolled Release of Electrical, Mechanical, and Other Types of Hazardous Energy
http://www.cdc.gov/niosh/face/In-house/full200506.html

EXHIBITS:

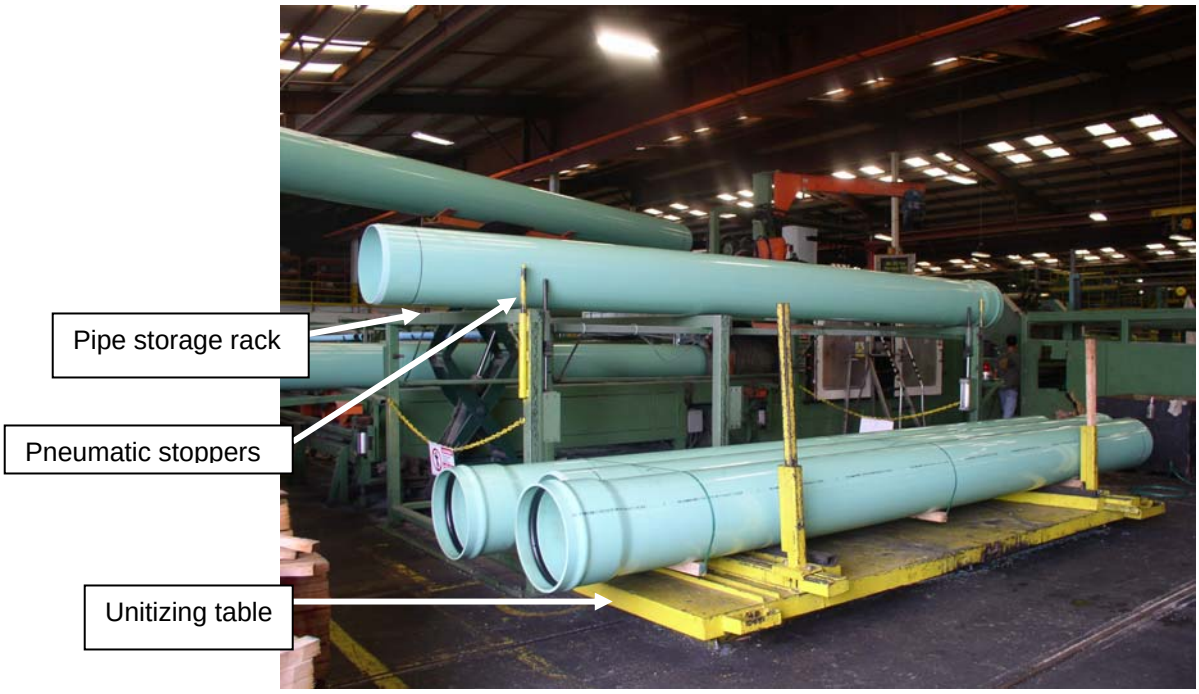

Exhibit1**.** The pipe storage rack and unitizing table.

Exhibit 2**.** The pipe storage rack and unitizing table from a different angle.

Exhibit 3. The area under the pipe storage rack where the victim was leaning over the pipe when the incident occurred.

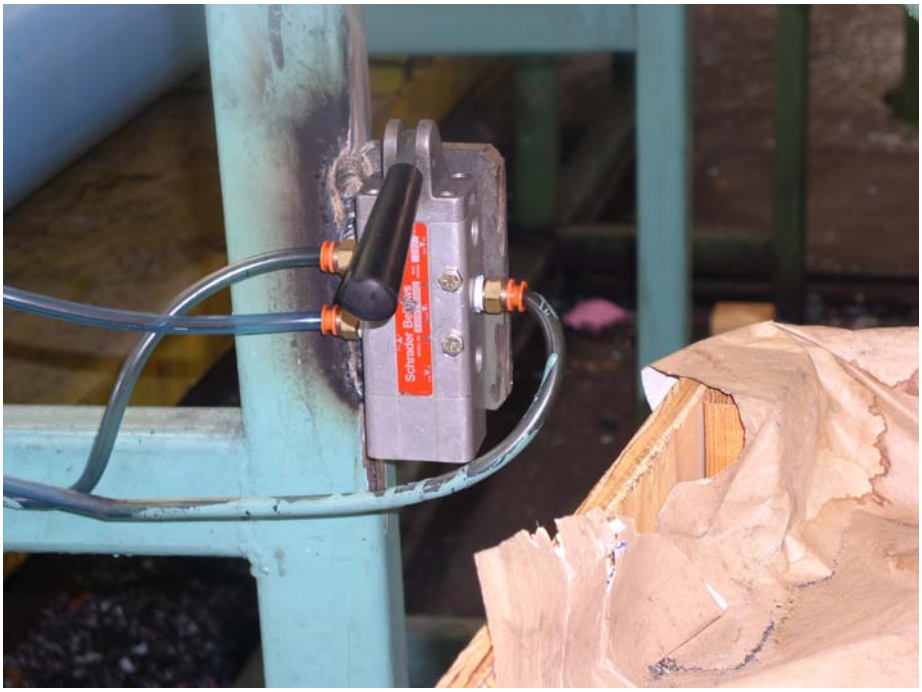

Exhibit 4. The switch used to activate the pipe storage rack stoppers.

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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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