NURSE REPORT	OCCUPATIONAL HEALTH BRANCH DEPARTMENT OF HEALTH SERVICES STATE OF CALIFORNIA
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NURSE REPORT #6 MAINTENANCE WORKER'S ARM BROKEN BY FRUIT-TRAY TRANSPORTER CDHS(COPH)-FI-92-005-06

Summary

A maintenance worker in a fruit drying plant was cleaning and oiling a *tray transporter*. A tray transporter is a set of rollers which move trays of fruit across the plant. The rollers are turned by a chain drive and a rotating shaft.

The safe method to clean and oil this tray transporter is to shut the power off, lock the power switch, unbolt a guard that shields the rollers, and work on that side, opposite the chain drive and shaft.

To save time the worker left the transporter running and did not unbolt the guard. Instead he climbed under the transporter and worked on the same side as the rotating shaft. When he leaned over the rotating shaft to oil the rollers the shaft caught his jacket sleeve. The shaft pulled his arm in and broke both bones in his forearm. His partner got to the switch in a few seconds and turned off the machine.

How could this injury have been prevented?

-Follow safety procedures. The plant had a procedure for shutting off the power and oiling the rollers from the safe side.

-Do not wear loose clothing when working around machinery.

-Make sure that company safety procedures are acceptable to workers. If workers skip safety steps the steps may need to be changed.

-Foremen should go over safety procedures with workers when they assign jobs.

CASE 192-012-01 May 22, 1992

The NURSE (Nurses Using Rural Sentinel Events) project is conducted by the California Occupational Health Program of the California Department of Health Services, in conjunction with the National Institute for Occupational Safety and Health. The program's goal is to prevent occupational injuries associated with agriculture. Injuries are reported by hospitals, emergency medical services, clinics, medical examiners, and coroners. Selected cases are followed up by conducting interviews of injured workers, co-workers, employers, and others involved in the incident. An on-site safety investigation is also conducted. These investigations provide detailed information on the worker, the work environment, and the potential risk factors resulting in the injury. Each investigation concludes with specific recommendations designed to prevent injuries, for the use of employers, workers, and others concerned abouthealth and safety in agriculture.

BACKGROUND

On February 4, 1992, NURSE staff learned of an agricultural-related injury while conducting a record review of the emergency department of a regional trauma center. In this injury a maintenance worker sustained a broken arm while cleaning and oiling machinery in a California fruit dehydrating and packaging plant. At the time of the incident the equipment was undergoing a pre-season maintenance check and was not being operated. The equipment transports trays of fruit from the storage bin on a set of chain driven rollers, dumps the fruit into a holding bin and then moves the trays back to the loading area.

A nurse from the NURSE project conducted an interview with the injured worker on February 14, 1992. At this time, the injured worker stated he had at least seven years of experience doing this type of work at the plant. The employee also said he had received safety training for cleaning and maintenance of machinery at the fruit processing plant. An on-site investigation was conducted on March 13, 1992 by the Senior Safety Engineer and the nurse. The incident was discussed with the vice president of the company who handles personnel and is also the company safety director. The local Cal/OSHA compliance office was notified by the employer. Because the employee was treated in the emergency department and not admitted to the hospital for treatment, the Cal/OSHA compliance office did not visit the job-site or investigate the incident.

The incident occurred in a fruit processing plant in a rural area, with approximately 163 employees in peak season. Ten workers are full-time and three are family members who work at the plant. The employer has an on-going safety program. The company safety and health program was reviewed by the local OSHA compliance office the previous year following a complaint generated visit (the complaint was relative to hazard communication). The company's Injury Prevention Program was reviewed by the Senior Safety Engineer from the NURSE project and was found to address all seven points within California Code of Regulations Title 8 3202. (As of July 1, 1991 the State of California requires all employers to have a written seven point injury prevention program: 1. designated safety person responsible for implementing the program; 2. mode for ensuring employees compliance; 3. hazard communication; 4. hazard evaluation through periodic inspections; 5. injury investigation procedures; 6. intervention process for correcting hazards; and 7. a health and safety training program.)

The employer has a safety training program which includes safety meetings every two weeks. New hires are given safety training along with their initial work training program. Maintenance employees work in pairs or a "buddy system" which provides a safety back- up if there is a problem.

INCIDENT

On January 21, 1992 at approximately 2:50 p.m. a local emergency medical service (EMS) was called via 911 and notified that a maintenance worker's right arm had been fractured. At this time the

dehydrating plant's safety director was also notified. The worker was a 23 year old Hispanic male.

The injured maintenance worker, one of 10 full-time year around employees, was cleaning and lubricating the rollers leading to the tray transporter. The standard operating procedure was to stop the equipment (by shutting the power off and locking the power switch), remove a tray barrier guard (which prevents the trays from falling on the floor as they move down the line) and service the equipment on the side of the tray transporter away from its rotating drive shaft. The rolling device which moves the trays away from the unloading station was left on and moved at a slow rate. The employee climbed under the structure which supports the tray transporter and started to lubricate the rollers from the inside of the equipment stand. As he leaned over the rotating shaft to oil the rollers the right sleeve of his jacket was caught in the rotating shaft. He tried to remove his arm from his jacket but his arm had already become entangled in the rotating shaft. He immediately called for his work partner to turn off the machine. His partner was nearby and able to turn the machine off within a few seconds.

While awaiting the arrival of the EMS, the safety director arrived on the scene and had the rotating shaft cut loose from the machine, but did not attempt to free the worker's arm.

Paramedics from the EMS and the district fire department arrived 22 minutes after being contacted. The EMS personnel removed the arm from the part of the shaft which had been cut loose. They splinted and applied an ice pack to the arm. Oxygen was administered and a Lactated Ringers solution IV was started. The injured worker was then transported to the local emergency department of the regional trauma center; he arrived there one hour after the initial 911 telephone contact. The injured worker underwent a closed reduction of a fracture of the right radius and ulna. He was kept in the emergency department for observation and was then discharged later that evening.

PREVENTION STRATEGIES

1. Normal operating procedure called for lock-out of all equipment prior to servicing. ("Lock-out" involves shutting off the power to the equipment and padlocking the power switch.) If the machinery was not powered then the shaft would not have been rotating and even if the worker's sleeve came into contact with the shaft it would not have been caught. If the employee had followed this company policy while servicing the equipment this injury would not have occurred.[1]

2. In this incident the worker's clothing got caught on the rotating shaft. If the worker had worn tight-fitting clothing which could not become caught by machinery this injury might have been prevented. This is an inexpensive and relatively simple way of preventing machinery entanglement.[2]

3. The standard operating procedure for oiling the roller system is to remove the tray barrier so that the rollers could be more easily accessed from the side away from the rotating shaft. To remove the barrier the worker would have had to unbolt four bolts which would take approximately five minutes; however, he chose to by-pass this procedure. Therefore, the worker leaned over the rotating shaft in order to reach the rollers from the other side. If the worker had followed standard procedure he would have accessed the rollers from the correct side and would not have come into contact with the rotating shaft.

4. This incident points out the importance of ensuring that company procedure is acceptable to the workers. In this incident, the worker intentionally chose to by- pass an established company procedure to save time. This indicates that the procedure was not acceptable or easily followed. Workers should be allowed to review and comment on maintenance procedures for equipment that they service.

5. The foreman should re-enforce the importance of safety procedures at the work site with the maintenance workers prior to starting the work day. Emphasis should be on pointing out specific

hazards related to their tasks. This should also include ensuring employees understand that safety procedures must be followed to prevent injuries. If this worker had been instructed earlier that day as to the hazards related to his specific job tasks for that day, he might not have violated the standard operating procedures.

6. The company safety policy and training instructed workers not to wear loose clothing when working around machinery. At the time of this investigation the safety director noted that the sleeve of the worker's coat was loose and had become entangled in the rotating shaft. If the foreman had noted the worker's loose clothing prior to his entanglement, this injury would have been prevented.

7. In this incident the worker did not lock-out equipment and was working in the vicinity of a rotating shaft; these hazards should be clearly made aware to the worker. One way of notifying workers about hazards is to use warning signs placed in the vicinity of the hazard. The employer could post warning signs in strategic locations near switch boxes and power sources reminding employees to lock-out power prior to servicing equipment, and near any mechanical hazards such as the rotating shaft. Use of signs may help increase worker's awareness about hazards and how to avoid them. In this incident, if the worker had seen a sign specifically identifying a hazard (the rotating shaft) he might not have leaned over it and come into contact with it.

1. Title 8 California Code of Regulations 3314. "Machinery or equipment capable of movement shall be stopped and the power source de-energized or disengaged...during cleaning, servicing, or adjusting operations."
2. Title 8 California Code of Regulations 3383 (b). "Loose sleeves, tails, ties, lapels, cuffs, or other loose clothing which can be entangled in moving machinery shall not be worn."