

Arm Caught in Mechanical Cotton Picker¹

California NURSE Project²

SUMMARY: CASE 192-549-01

A mechanical cotton picker was stopped in a field. The machine driver and his foreman were cleaning the machine's spindles. These spindles pull the cotton off the plant and into the machine. They get clogged with cotton leaves and twigs. To clean them, spindle covers must be lifted off the spindles. On top of the machine are power shafts, running from the engine to the spindles.

The foreman told the driver to start the cotton picker. The driver started the machine, but kept it out of gear. This meant that the spindles were not turning, but the power shafts were. They noticed a spindle cover was loose. The driver climbed up on the machine to bolt it down. The driver's sweater sleeve became caught in one of the turning power shafts. The sleeve wrapped around the shaft and cut into his arm, almost taking it off. He spent two weeks in the hospital, and his arm has permanent nerve and muscle damage.

How could this injury have been prevented?

- Never work around unguarded power shafts.
- Fit equipment with necessary safety devices, including guards for power shafts.
- Employees should not be asked to place themselves in dangerous positions.

BACKGROUND

On November 16, 1992, NURSE staff identified an injury in a cotton field while reviewing records at a Regional Trauma Center. A 39 year-old Hispanic male cotton picker driver injured his arm on November 11, 1992 while bolting down a spindle cover on a mechanical cotton picker. An unguarded, rotating power shaft caught his sweater sleeve and tightened the sleeve around his arm. The sleeve cut into his arm and nearly amputated it.

A nurse from the NURSE Project interviewed the injured driver in the hospital on November 16, 1992. On January 5, 1993, the senior safety engineer from the NURSE Project interviewed the farm labor contractor (the injured driver's employer) at the contractor's field office and equipment yard. At this time, he examined the mechanical cotton picker involved in the injury. NURSE staff also reviewed the worker's hospital records.

The California Occupational Safety and Health Administration (Cal/OSHA) was not notified and did not investigate the incident.

The incident occurred on a 200-acre cotton farm. The injured driver had driven mechanical cotton pickers for the past six years. His employer, a farm labor contractor, had been hired by the farm owner to harvest a cotton field. The injured driver had worked for him for one month. This farm labor contractor recruits and manages workers for farm owners in a variety of crops and tasks. He employs 6 full-time workers, 150 casual workers (working 1-12 weeks per year), 50 seasonal workers (working 13-39 weeks per year), and 4 family members.

1. This document, CDHS(COHP)-FI-93-005-27, was extracted from a series of the Nurses Using Rural Sentinel Events (NURSE) project, 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. Publication Date: March 1993.

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The injured driver stated he had received formal, verbal safety training, but the farm labor contractor could not give details of the training. The farm labor contractor said he had a written safety program, but it was not available for review by the NURSE senior safety engineer. (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 employee compliance; 3. hazard communication; 4. hazard evaluation through periodic inspections; 5. injury investigation procedures; 6. intervention process for correcting hazards; and 7. provide safety training and instruction. Title 8 California Code of Regulations 3203.)

INCIDENT

On November 11, 1992, at approximately 11:00 a.m., the driver of a mechanical cotton picker stopped his machine to clean plant debris off the cotton picker's spindles. A mechanical cotton picker is a large, self-propelled machine. Vertically rotating spindles pull the cotton into rubber disks which remove the cotton from the plant. The cotton is then vacuumed into a holding basket at the rear of the machine. Rotating drive shafts run from the engine to the spindles to power them.

The foreman and the driver lifted the covers off the cotton picker's spindles to clean them. Upon completion, the foreman wanted to see if the rotating drive shafts were working properly. He told the driver to start the cotton picker.

The driver started the machine and put the drive system into neutral. This kept the spindles from turning, but the drive shafts rotated. They noticed a spindle cover was loose. The foreman told the driver to climb up and lay down on the spindle cover to hold it down and bolt it in place. After it was bolted, as the driver was standing up, his sweater sleeve became caught on an unguarded universal joint on the rotating power shaft. The rotating shaft tightened the sweater, which twisted and cut deeply into his upper arm.

The foreman jumped into the driver's seat of the mechanical cotton picker and turned off the machine. With the help of co-workers, he cut the driver's shirt and sweater free from the shaft and released his arm.

The injured driver did not lose consciousness. Co-workers tried to stop the bleeding from his arm with dirty and oily rags. No members of the work crew were trained in first aid. He was placed in a pickup truck

belonging to the farm labor contractor and transported to the emergency department of a local hospital. This trip took approximately 23 minutes. He was then transferred almost immediately by ambulance to a Regional Trauma Center for treatment.

The injured driver's upper left arm had a deep laceration caused by his sweater twisting and cutting into his arm. His arm sustained brachial nerve damage and extensive soft tissue and muscle damage. After initial treatment in the emergency department, the injured driver was taken to surgery to clean and temporarily close the wound. A week later he received a skin graft to close the wound. He was discharged from the hospital 13 days after the incident. At the time of discharge he was advised not to return to work for at least a month, and to avoid strenuous activities.

PREVENTION STRATEGIES

1. Standard operating procedures should ensure that employees are never required to intentionally place themselves in hazardous situations to complete a work task. Standard operating procedures should be explained in a comprehensive injury and illness prevention program (Title 8 California Code of Regulations 3203: Injury and Illness Prevention Program). In this incident, the foreman instructed the driver to climb onto the machine in close proximity to unguarded rotating power shafts. A method should have been selected which did not involve placing a worker in this vulnerable position. If the worker had not been on top of the machine, this injury would not have occurred.
2. Field crews should have an adequate emergency medical response procedure. The crew should have a cellular phone or radio available to contact the Emergency Medical Services (EMS). Crews should be trained to call 911 before moving an injured worker. One or more members of the crew should be certified in first aid and cardiopulmonary resuscitation (CPR) (Title 8 California Code of Regulations 3400(b): "In the absence of an infirmary, clinic, or hospital in near proximity to the workplace... a person or persons shall be adequately trained to render first aid." Title 8 California Code of Regulations 3439(b) "There shall be at least one employee for every twenty employees any remote locations with training for the administering of first aid"). In this incident, if a crew member had been trained in first aid, and if a cleaner rag was available at the injury site, he/she would have known to use

it instead of the dirty, oily rag to decrease the likelihood of wound contamination.

- Employers should evaluate their equipment to make sure that it incorporates all modern safety features, and consider replacing or retrofitting equipment to incorporate safety features. Even the newest equipment available should be reviewed for guards and safety devices. The manufacturer of the mechanical cotton picker involved in this incident has since installed guards on all the rotating shafts on the new machines. The manufacturer has also installed a system which turns off all the machinery, including the power shafts, when the driver steps off the seat. If either of these safety features had been present on this cotton picker, this injury might not have occurred.

FURTHER INFORMATION

For further information concerning this incident or other agriculture-related injuries, please contact:

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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 about health and safety in agriculture.