*This presentation is for illustrative and **general** educational purposes only and is not intended to substitute for the official MSHA Investigation Report analysis nor is it intended to provide the sole foundation, if any, for any related enforcement actions.*

GENERAL INFORMATION

Coal Mine Fatal Accident 2003-18

Operator:	Solar Sources Inc.
Mine:	Craney Mine
Accident Date:	June, 23, 2003
Classification:	Machinery
Location:	District 8, Vincennes, Indiana
Mine Type:	Surface
Employment:	110
Production	3,700 tons/day

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OVERVIEW

- On June 23, 2003, a 47-year old mechanic with 27 years of mining experience was fatally injured at a surface mine repair yard while preparing to move a section of an excavator mainframe with a front-end loader.
- The mainframe was to be used to block up another piece of equipment that was going to be repaired.

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OVERVIEW

- After the front-end loader operator positioned the loader bucket over the mainframe section, the victim reached under the bucket to attach a chain between the mainframe section and the bucket.
- During the process, the loader bucket drifted downward, pinning the victim's head between the mainframe and the bucket.

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ACCIDENT DETAILS

- The victim was at a surface repair yard preparing to work on a 988-F Caterpillar front-end loader, which was being torn down to be bushed and pinned.
- During lunch, he ask another mechanic to help him split the 988-F front end-loader so he could continue work on the machine.
- They decided to use the 980-C front end-loader to move material needed to block the 988-F loader prior to separating it.
- A smaller front end-loader equipped with forks was normally used for this task, but was being used by the pumper at that time.

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ACCIDENT DETAILS

- After lunch, the mechanic, drove the maintenance truck approximately one mile to the Pit parking lot to get the 980-C front end-loader. He returned with the 980-C front end-loader to the surface repair yard.
- They considered using wooden crib blocks for blocking, which were located at the east end of the yard. However, the victim decided to use a metal section of a main frame of an 801 Hitachi shovel, which mechanics often used to block raised equipment.
- The metal block was located nearby in the yard and the mechanic drove the 980-C front-end loader to the metal block location.
- The victim was standing behind the metal block holding a chain in his left hand, when the loader arrived. He signaled with his right hand for the mechanic to position the 980-C front-end loader bucket over the metal block.

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ACCIDENT DETAILS

- After positioning the bucket, the mechanic applied the loader parking brake.
- At this point, victim was going to hook the metal block to the front-end loader bucket with a chain.
- During this time, the victim disappeared from the equipment operator's field of vision, where he remained unseen for several minutes.
- The equipment operator walked toward the bucket to see what was taking so long and found the victim with his head pinned between the metal block and the bucket.

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ACCIDENT DETAILS

- The front-end loader operator rushed back to his cab and raised the bucket.
- He then checked the victim for a pulse and found none.
- Help was summoned and 911 called.
- The victim was later pronounced dead by the county deputy.

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PHYSICAL FACTORS

- The surface repair yard was also utilized for storage of spare parts, equipment, and other material.
- The ground level of the surface repair yard was compacted shale, rock, and soil in the immediate area.
- Surveys showed the loader was parked on a 2.5% grade.
- Weather conditions were clear and dry with temperatures in the mid-90's.
- The victim was positioned underneath the loader bucket, attempting to hook a chain from the metal blocking to the front-end loader bucket.
- There were no blocks or other mechanical means of control being utilized to secure the bucket and prevent accidental movement.
- The equipment operator was located in the cab of the front-end loader and could not see the victim at the time of the accident.

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EQUIPMENT

- The 1984 Caterpillar Model 980C wheel-mounted front-end loader was evaluated and tested.
- Drift rates for the bucket tilt cylinders and the boom lift cylinders were within the acceptable range listed in the manufacturer's maintenance manual.
- The drop rate for the bucket was approximately one inch per minute when the hydraulic fluid temperature was approximately 135°F.
- Although no defects were found in the operation of the service brakes and park brakes, an audible air leak of approximately one PSI/Minute was found in the air supply hose connecting to the service brake treadle valve.
- When placed on the 2.5% grade at the accident site with both the service brake and park brake released, the front-end loader moved backward approximately 4 inches and the height of the bucket in reference to the mainframe was reduced by ¼ inch.

ROOT CAUSE ANALYSIS

- *Causal Factor:* The victim was unaware of the downward drift of the front-end loader bucket.

- *Corrective Actions:* Management shall ensure that all raised equipment be blocked against motion prior to persons performing work underneath them.

- *Causal Factor:* Other than normal methods were being used to raise and move material.

- *Corrective Actions:* Management should establish standard procedures to be followed when lifting and moving blocking material. Employees should be trained in these procedures.

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CONCLUSION

The cause of the accident was that the front-end loader bucket was not blocked against motion while work was being performed underneath the raised bucket.

ENFORCEMENT ACTIONS

104(a) Citation for a violation of 30 CFR 77.405(b)

A lead mechanic was performing work beneath a 980-C front-end loader bucket. The front-end loader bucket was not blocked against motion.

BEST PRACTICES

- Securely block raised equipment to prevent accidental movement before working beneath such components.
- Ensure that personnel are trained to recognize hazardous work procedures, including working in pinch points where inadvertent movement could cause injury.
- Discuss work procedures and identify all hazards associated with the work to be performed, along th the methods to protect personnel.
- Maintain good communication between co-workers.

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