

OE-3: 2023-02

June 2023

Preventing Injuries from Power Saws

PURPOSE

This Operating Experience Level 3 (OE-3) is to bring attention to multiple incidents across the Department of Energy (DOE) complex resulting in serious injuries from power saws.

BACKGROUND

Power tools are a common part of work taking place across the DOE complex. Their prevalence may lead to complacency and a reduced appreciation for the significant hazards they pose. This OE-3 focuses specifically on the dangers of using various types of power saws.

While there are many hazards that power saws present to workers, one is the serious injury that can occur when a worker contacts the saw blade. The events occurring across DOE sites have ranged from serious lacerations to a significant amputation which can impact the workers for the rest of their lives.

OPERATIONAL HISTORY

The injuries in this OE-3 were reported in the DOE Computerized Accident/Incident Reporting System (CAIRS) and Occurrence Reporting and Processing System (ORPS) over the past year. Following are brief descriptions of those incidents:

Portable band saw

- On March 21, 2022, a worker was cutting electrical conduit, holding the pipe in the left hand and operating the saw with the right hand. The blade tipped and the worker's left hand got caught in the blade, resulting in a laceration to the finger.
- On April 30, 2022, a worker was cutting a piece of metal using a portable band saw. When finished with the cut, the worker's glove was caught by the blade. This pulled their hand towards the blade making contact with the back of the left index finger, resulting in a laceration.

- On September 12, 2022, a worker was putting tools away at the end of a job and met resistance trying to close the tool bin door. The worker opened the door, picked up the cordless portable band saw (with the battery installed) and pushed the tools all the way inside the tool bin. The band saw activated, resulting in a laceration to the worker's finger.
- On November 11, 2022, a worker was using a battery-operated portable band saw to cut 2-inch conduit when the band saw slipped off the conduit and contacted the base of the worker's right thumb resulting in a laceration requiring 6 sutures.
- On December 9, 2022, a worker was using a portable band saw to cut off some metal hooks and it slipped, cutting the worker's left hand resulting in a laceration.

Concrete cutting saw

- On October 25, 2022, a worker was operating a concrete cutting saw when a water hose line held by another employee struck the concrete saw. The saw shifted and cut the worker's leg.

Reciprocating saw

- On December 6, 2022, a worker was cutting a 4-inch diameter pipe with a reciprocating saw. The saw slipped and cut the employee's left hand between their thumb and index finger, resulting in a laceration that required 6 sutures.

Miter saw

- On May 23, 2022, a worker was operating a 10-inch miter saw. After a cut, the worker released the trigger switch, removed their hand from the saw handle, and placed their hand under the blade to push new material into position. The saw blade was still spinning, and their right hand contacted the blade resulting in a laceration below the first knuckle of the index finger. The saw arm had not gone

up to its fully upright position after being released and the guard was only partially deployed.

Jig saw

- On July 7, 2022, a worker was using a jigsaw to cut a 30-gallon poly drum when the blade bounced out of the kerf and cut the worker's hand between the wrist and thumb, requiring 5 sutures.

Hole saw

- On October 20, 2022, a worker was holding a wood board while another worker was using a hole saw to cut the board. The saw went through the wood and cut the first worker's right index finger.

Circular saw

- On November 9, 2022, a worker was using a circular saw, cutting a piece of 2-inch by 4-inch lumber and sustained an injury to their left index finger. The injury resulted in a partial traumatic amputation of the finger.
- On January 24, 2023, a worker was using a circular saw to cut 4"x4" handrail posts during construction of new stairs. The employee removed their right hand from the tool after completing the cut but prior to the saw coming to rest. The worker inadvertently contacted the saw blade with their right middle finger, resulting in a laceration requiring 5 sutures.

RECOMMENDATIONS

Following these basic safety protocols will help to prevent the occurrence of serious incidents involving saws:

- Perform job activity-level hazard analyses prior to beginning work to determine potential hazards of the job.
- Inspect all equipment. Do not use power tools that need repair (e.g., safety guards not functioning properly) or replacement.
- Select or purchase equipment with added safety design features (e.g., some portable band saws have a safety feature which requires two hands to push dual switches before the motor will turn on).
- Provide training emphasizing the proper use of all tools. Workers should be able to recognize the hazards (e.g., mechanical energy from saw blades still coasting after being turned off) associated with different types of tools and the necessary safety precautions.

- Remind workers that much of the blade is exposed by design on many saws. Contact can be made before or after the cut, or during the cut if the operator's hand is securing material underneath the stock and in the path of the blade. For example, guards used on miter or concrete saws are self-adjusting to the thickness of the material being cut (i.e., the guards do not necessarily prevent blade contact).
- Understand each saw is different. As with any piece of equipment or power tool, it is important to read, understand, and follow the safety precautions in the operator's manual.

SUMMARY

The use of power saws is inherently hazardous as evidenced by these serious injuries. Incidents such as these can be prevented through effective hazard identification and implementing appropriate safety controls.

REFERENCES

- 10 CFR 851, Worker Safety and Health Program
- Machine Guarding eTool <https://www.osha.gov/etools/machine-guarding>
- Hand Sawing <https://csda.org/specification-hand-sawing-csda-hs-108/>
- Human Factors Assessment Report <https://www.osti.gov/servlets/purl/792086>
- Handheld Power Saws https://www.osha.gov/sites/default/files/publications/OSHA_FS-3627.pdf

Questions regarding this OE-3 document can be directed to Craig Schumann at 630-252-9176, craig.schumann@hq.doe.gov or oc@hq.doe.gov

This OE-3 document requires no follow-up report or written response.



Josh Silverman
Director
Office of Environmental Protection and ES&H Reporting
Office of Environment, Health, Safety and Security

Appendix: Types of Power Saws

A portable band saw is a hand-held machine equipped with an endless steel band saw blade around two wheels and through saw blade guides used for sawing materials.



A concrete cutting saw (hand-held power saw/cut-off saw) is a machine equipped with a circular blade. The operator is responsible for holding the saw correctly and depressing the pressure control (trigger).



A reciprocating saw is a hand-held machine equipped with a moving blade that alternately changes direction on a linear cutting axis used for sawing materials.



A hole saw is a small cylindrical blade that is typically mounted onto a drill via an arbor. It is designed to connect a hole saw to a drill chuck.



Circular saws are a hand-held machine used for straight sawing. Depending on the blade, they cut either across (crosscut) or with (rip) the grain of the wood.



A miter saw is a circular power saw that is mounted on a frame and designed to make accurate angle cuts. The saw blade and motor are mounted on an elbow hinged arm, which is fixed at the rear of the saw. When the blade is lowered in a chopping motion, the blade cuts through the work piece, passing through a slot in the base.



Jig saws are a hand-held machine that are useful for precision-cutting, intricate curves and patterns in thin stock. They have thin blades that move rapidly up and down. The blade is held in upper and lower chucks that pull it tight and keep it from bending.

