MEDIA FACT SHEET

PORTABLE GENERATORS – RISKS AND PREVENTION

CPWR
THE CENTER FOR CONSTRUCTION RESEARCH AND TRAINING

The Problem for Construction Workers

Portable generators are internal combustion engines used to generate electricity when temporary or remote power is needed. They are an essential tool used by the construction industry on a regular basis to power on-site trailers, lights, and certain types of tools.[1]

If not used properly, portable generators can be extremely hazardous. Two of the most common causes of injuries or fatalities are carbon monoxide (CO) poisoning from inadequate ventilation and shocks/electrocution.[1]

CO poisoning is a major concern because CO is an odorless and colorless gas. If used in an enclosed or partially enclosed space, a portable generator can produce CO concentrations within minutes that exceed 1,200 parts per million, a level defined by the National Institute for Occupational Safety and Health (NIOSH) as being Immediately Dangerous to Life and Health (IDLH).[2] By the time a worker realizes something is wrong, it may be too late. This was the case for a 43-year-old carpenter who passed out and died from CO exposure while working alone inside a metal storage container while using a gasoline-powered generator.[3] Improper use of portable generators can also cause fires and may expose workers to noise and vibration hazards.[1]

Injuries and Fatalities are Preventable

Always use portable generators outdoors. The Occupational Safety and Health Administration (OSHA) and NIOSH warn users to never use portable generators indoors, in enclosed or partially enclosed spaces such as garages or basements, or outdoors near doors, windows, or vents. They should only be used in well-ventilated areas.

In addition, OSHA requires employers to take the following steps to protect their employees from other related hazards by[1,4]:

- Always following manufacturer instructions.
- Never attaching a generator directly to the electrical system of a structure (home, office, or trailer) unless a qualified electrician has properly installed the generator with a transfer switch. Otherwise, there is a risk of electrocution.
- Only using the manufacturer's supplied cords or heavy-duty extension cords that are in good condition (not frayed or damaged) and grounded (3-pronged).
- Using ground fault circuit interrupters (GFCIs) to ensure the power will be shut off if an electrical current is detected outside normal paths.
- Keeping the generator dry. Do not use generators in the rain or wet conditions.
- Shutting down the generator and allowing it to cool before refueling, and keeping fuel away from heat and flame producing devices (such as the generator itself) in order to prevent fires.
- Positioning the generator as far away as possible from the work area. Employers should also ensure that workers have the appropriate hearing protection and other personal protective equipment (PPE) in order to prevent injuries from hazardous noise and vibration.
- Following OSHA requirements for grounding portable and vehicle-mounted generators: 29 CFR 1926.404(f)(3).

CPWR Research and Resources

- **Carbon Monoxide Poisoning Hazard Alert Card** – a brief, image-driven handout to help workers understand how to work safely with gas-powered generators and other equipment. Available in English and Spanish.
- **Carbon Monoxide Toolbox Talk** – a short discussion guide for use by foremen or supervisors to raise worker awareness and discuss site-specific actions to prevent carbon monoxide poisoning. Available in English and Spanish.

Other Resources

- Using Portable Generators Safely – OSHA Fact Sheet, 2005
- Grounding Requirements for Portable Generators – OSHA Fact Sheet, 2005
- Portable Generator Safety – OSHA Quick Card, 2005
- Carbon Monoxide Hazards from Small Gasoline Powered Engines – NIOSH

About CPWR

CPWR - The Center for Construction Research and Training [CPWR] is a 501(c)3 non-profit dedicated to reducing injuries, illnesses, and fatalities in construction, and currently serves as NIOSH's National Construction Center. Through research, training, and service programs, CPWR works in partnership with industry stakeholders, safety and health professionals, academics, and key government agencies, to identify and find solutions for occupational hazards and improve the safety and health of construction workers. For more information, please visit: www.CPWR.com

References

[1]Occupational Safety and Health Administration [OSHA], 2005. *OSHA Factsheet: Using Portable Generators Safely.* https://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generator_safety.pdf

[2]National Institute for Occupational Safety and Health [NIOSH], Colorado Department of Public Health and Environment [CDPHE], U.S. Consumer Product Safety Commission [CPSC], OSHA, & U.S. Environmental Protection Agency [EPA], 1996. *Preventing Carbon Monoxide Poisoning from Small Gasoline-Powered Engines and Tools.* https://www.cdc.gov/niosh/docs/96-118/

[3]NIOSH, 2008. *Carpenter Dies from Carbon Monoxide Poisoning while Using a Gasoline Powered Generator Inside a Construction-site Storage Container - Massachusetts.* https://www.cdc.gov/niosh/face/stateface/ma/06MA059.html

[4]OSHA, 2005. *Grounding Requirements for Portable Generators.* https://www.osha.gov/OshDoc/data_Hurricane_Facts/grounding_port_generator.html

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