

Safe Operation of Backup Power Generators

David W. Smith, Extension Safety Program
The Texas A&M University System

Portable generators are useful when temporary or remote electric power is needed, but they can also be deadly. The primary hazards to avoid when using a generator are carbon monoxide (CO) poisoning from generator exhaust fumes, electrocution and fire.

Carbon monoxide danger

Carbon monoxide is an odorless, colorless gas byproduct of incomplete combustion of fuels, such as natural gas, heating oil and diesel. This toxic gas interferes with the blood's ability to carry oxygen to internal organs. People exposed to carbon monoxide will experience a range of symptoms. Low-level exposure can result in headaches, lethargy, weakness, nausea and muscle aches. High-level exposure can cause paralysis, impaired judgment and even death.

Preventing CO poisoning

- Never operate a generator indoors. This includes homes, garages, basements, attics or other enclosed or partially enclosed areas even when you think there is sufficient ventilation. Opening windows and doors will not prevent CO buildup.
- Locate the generator outdoors away from windows, doors and vents where CO gas can enter the home.
- Install CO alarms with battery backup in your home according to the manufacturer's recommendations. CO alarms should be certified to meet requirements of the latest safety standards (UL 2034, IAS 6-96 or CSA 6.19.01). Test alarms frequently and replace dead batteries.

Electrocution dangers

Portable generators convert liquid fuel to electrical power to operate electrical appliances, tools and other devices. Homeowners should protect themselves and family members from electrical shock and electrocution by using portable generators correctly.

Preventing electrocution

- Keep the generator dry and do not expose it to rain or place it on wet surfaces. Operate it on a dry surface under an open, canopy-like structure. Remember to dry your hands before touching the generator.
- Plug appliances directly into the generator or use a heavy duty extension cord that is rated for outdoor use. Make sure the extension cord is also rated (in watts or amps) at least equal to the sum of the connected load. Check that the cord has no cuts or tears and that the plug is a three-prong plug equipped with a grounding pin.
- Never plug the generator into a wall outlet in a house or other circuit. This practice, known as "back feeding," is extremely dangerous because it energizes the failed electrical wiring supplying the home. This could electrocute unsuspecting utility workers and/or neighbors who might be servicing the electrical system. It also bypasses some of the built-in household circuit protection devices.
- If you must connect the generator to the main house wiring, contact a licensed electrician to do the installation. The professional will install

the proper disconnect or transfer switch to prevent the current from “back feed” situations.

- Permanently installed, stationary generators are better suited to provide backup power to a home during power outages. Even a properly connected portable generator can become overloaded. This can cause overheating or stressing of the generator components and possibly lead to a generator failure.

Fire dangers

Fires can occur when refueling portable generators or when fuel is stored in inappropriate areas.

Preventing fires

- Never store generator fuel in your home. Gasoline, propane, kerosene and other flammable liquids should be stored outside of living areas in properly labeled, non-glass safety containers.
- Do not store fuel near a fuel burning appliance, such as a natural gas water heater in a garage. If the fuel spills or the container is improperly sealed, invisible fuel vapors from the container can move along the ground and be ignited by the water heater’s pilot flame.
- Turn the generator off and let it cool before refueling. A gasoline spill on hot engine parts could ignite.
- Always store a fire extinguisher in the immediate vicinity of the generator.

Other safety precautions

- Always check the generator thoroughly each new season before you turn it on.
- Never attempt to repair a generator. Only qualified servicemen should perform repairs.
- Don’t remove or tamper with safety devices. They are for your protection.
- Don’t touch hot engine parts.
- Keep children away from the generator and fuel storage containers.

Post-Hurricane CO Poisoning Incidents

Hurricane Katrina made landfall on August 29, 2005 on the Gulf Coast of the United States. Because of widespread power outage and property damage, portable backup generators were used to operate electrical appliances and aid cleanup efforts.

From August 29 to September 24, 51 carbon monoxide (CO) poisoning cases were reported in Alabama, Louisiana and Mississippi. All but one case is thought to originate from improper use of portable generators. Of these cases, 46 were non-fatal, and five were fatal.

Source: Centers for Disease Control. Morbidity and Mortality Weekly Report. October 7, 2005.

Facts about Portable Generator Deaths

- 40 percent of deaths occur in winter months.
- 70 percent of deaths occur in the home.
- 26 percent of portable generator incidents involve multiple deaths.
- 80 percent of CO poisoning deaths associated with portable generators occur in adults 25 years and older.
- 72 percent of victims are male.

Source: Consumer Product Safety Commission. Release #04-141. May 20, 2004. Facts based upon 223 generator-related deaths from CO poisoning from 1990 through 2003.

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