

Severe Weather Safety

"Resources to help weather the storm"

Tornadoes: By the Basics

What:

A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes are generally spawned by thunderstorms, but they have been known to occur without the presence of lightning.



When:

Tornadoes can occur at any time of the year. In the southern states, peak tornado occurrence is in March through May, while peak months in northern states are during the summer.



Where:

Tornadoes can take place anywhere, and have been reported in every state in the United States, but the majority occur in the middle of the country. "Tornado Alley" is the area in which most tornadoes hit, which include the states of Texas, Oklahoma, Missouri, Kansas, and Illinois. They also occur in many other parts of the world, including Australia, Europe, Africa, Asia, and South America.



How:

For a tornado to develop, several conditions must be present in the atmosphere at the same time: abundant low-level moisture, atmospheric instability, and a catalyst such as a cold front or other low-level zone of converging winds that acts to lift moist air aloft.

Within an area in which conditions for tornado formation are favorable, air will rise and become saturated with moisture. As air continues to rise to greater and greater heights, it will produce a thunderstorm cloud if the atmosphere is unstable -- a situation that occurs when the temperature of the air drops rapidly as it rises, or when dry air overlays moist air near the ground.

(weather.com)

Tornado Watch vs. Tornado Warning

Tornado Watch: Tornadoes are possible in your area. Remain alert for approaching storms.

Tornado Warning: A tornado has been sighted or indicated by weather radar. If a tornado warning is issued for your area and the sky becomes threatening, move to a pre-designated place of safety.



Before the Tornado:

To be prepared for a tornado, it is critical to be familiar with tornado warning signs. Although tornadoes vary greatly in their appearance and provide little or no warning, the following signs can indicate that a tornado could be imminent.

- A **dark**, often **greenish sky**.
- A **wall cloud**, particularly if it is **rotating**.
- **Large hail**. Although not always, storms that produce tornadoes frequently produce large hail as well.
- A **loud roar**, similar to the sound of a freight train.
- Tornadoes may occur near the trailing edge of a **thunderstorm** and be quite visible. They may also be embedded in rain and **not be visible** at all.
- **Stay tuned** to local radio and TV stations or a National Oceanographic and Atmospheric Administration (NOAA) Weather Radio for further weather information.
- Watch the weather and be prepared to **take shelter** immediately if **conditions worsen**.
- **Designate an area** in your home as a shelter, and **practice** having everyone in the family go there in response to a tornado threat.
- Make sure everyone understands the **siren warning system**, or whatever warning system occurs in your area.
- Mark where your **first-aid kit** and **fire extinguishers** are located.



During the Tornado:

Just as you don't always know when a disaster will strike, you won't know where you will be when a disaster will strike. Follow these safety tips which include:

In a building structure such as a home, school, office, hospital or other public building:

- **Seek shelter** in a windowless, interior room; storm cellar; basement; or lowest level of the building.

- If you are in a **high-rise building**, go to a small interior room or hallway on the lowest floor possible.
- **Stay away from glass**, both in windows and doors.
- **Crouch down**, and make as small a “target” as possible.
- Get under a piece of **sturdy furniture** such as a bench or heavy table or desk
- Use arms to **protect head and neck**.

In a vehicle, trailer, or mobile home

- **Get out immediately** and go to the lowest floor of a sturdy, nearby building or a storm shelter.
- If you are in a car, and you can see a tornado forming or approaching, you should **leave the car and take shelter** as above. A tornado can blow a car off a road, pick a car up and hurl it, or tumble a car over and over.



Outside with No Shelter

- If caught in the open, **seek a safe place immediately**. The chances of encountering falling trees, power lines, and lightning is more likely than encountering the tornado itself.
- **Lie flat** in a nearby ditch or depression and **cover your head** with your hands. Be aware of the potential for flooding.
- **Do not get under an overpass or bridge.** You are safer in a low, flat location.
- **Never try to outrun a tornado.**
- **Watch out for flying debris.** Flying debris from tornadoes causes most fatalities and injuries.



After a Tornado:

Follow these safety precautions to help avoid injury after a tornado:

- Continue to **monitor** your battery-powered radio or television for emergency information.
- **Be careful when entering any structure that has been damaged.**
- **Stay out** of any building **if you smell gas.**
- Wear sturdy shoes or boots, long sleeves and gloves **when handling or walking on or near debris.**
- Be aware of hazards from **exposed nails and broken glass.**
- **Do not touch downed power lines** or objects in contact with downed lines. Report electrical hazards to the police and the utility company.
- **Use battery-powered lanterns**, if possible, rather than candles to light homes without electrical power.
- **Never use generators or charcoal-burning devices inside your home**, basement, garage or camper - or even outside near an open window, door or vent. Carbon monoxide (CO) - an odorless, colorless gas that can cause sudden illness and death if you breathe it - from these sources can build up in your home, garage or camper and poison the people and animals inside. *Refer ESFI's Portable Generator Safety Tips on Page 4*



- **Cooperate fully** with public safety officials.
- **Respond to requests** for volunteer assistance by police, fire fighters, emergency management and relief

organizations, but **do not go into damaged areas** unless assistance has been requested. Your presence could hamper relief efforts and you could endanger yourself.

Inspecting the Damage:

- **Walk carefully** around the outside your home and **check for downed or loose power lines, gas leaks and structural damage** before entering.
Refer to ESFI's Downed Power Line Safety Tips on page 6
- In general, if you suspect any damage to your home, **shut off electrical power, natural gas and propane tanks** to avoid fire, electrocution or explosions.
- If it is dark when you are inspecting your home, **use a flashlight** rather than a candle or torch to avoid the risk of fire or explosion in a damaged home.
- If you see frayed wiring or sparks, or if there is an odor of something burning, you should **immediately shut off the electrical system** at the main circuit breaker if you have not done so already.
- If you smell gas or suspect a leak, **turn off the main gas valve**, open all windows and leave the house immediately. Notify the gas company, the police or fire departments, or State Fire Marshal's office and do not turn on the lights, light matches, smoke or do anything that could cause a spark. **Do not return to your house until you are told it is safe to do so.**



Safety During Clean Up

- Wear **sturdy shoes or boots, long sleeves and gloves.**
- Learn **proper safety procedures and operating instructions** before operating any gas-powered or electric-powered saws or tools.
- **Clean up** spilled medicines, drugs, flammable liquids and other potentially hazardous materials.

Source FEMA



Portable Generator Safety:

Portable generators can provide a good, temporary source of power during storm-induced electrical outages, but can become deadly if improperly installed or operated.

Facts and Statistics

(Source Consumer Product Safety Commission (CPSC))

- From 1999 to 2010, nearly 600 generator-related **carbon monoxide (CO) deaths** have been reported to the CPSC.
- Over 80% of carbon monoxide deaths related to **portable generators** occur in the home, often resulting from operation of a portable generator within the living space of the home, including the basement, closets and doorways.

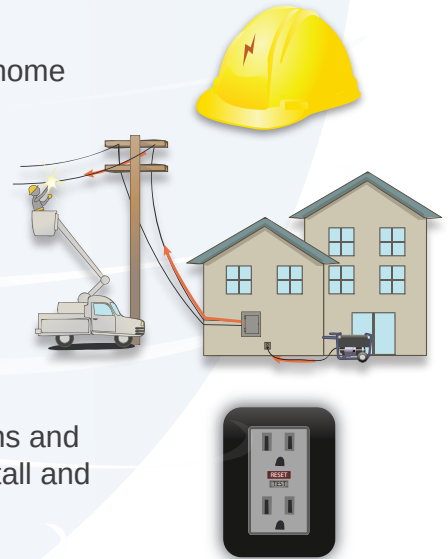


- One generator produces as much CO as **hundreds of cars**. CO from a generator is deadly and can **incapacitate and kill you within minutes**.
- 1/3 of all generator-related carbon monoxide deaths involved the use of generators **during a temporary power outage** stemming from a weather problem.
- Nearly 50% of all portable generator-related carbon monoxide deaths occurred during the **winter months** (November - February).

Taking a few simple precautions can keep you and your family safe from the dangers of carbon monoxide poisoning and electric shock resulting from the improper use of portable generators:

Generator Installation Safety Tips:

- ESFI strongly recommends that a **licensed electrician** install home generators to ensure they meet all local electrical codes.
- Do not connect generators directly to the household wiring without an appropriate **transfer switch** installed. Power from generators connected directly to household wiring can **backfeed** along power lines and **electrocute** anyone coming in contact with them, including utility lineworkers making repairs.
- Make sure your generator is **properly grounded**. Use a [ground fault circuit interrupter \(GFCI\)](#) to prevent electrocutions and electrical shock injuries. Portable GFCIs require no tools to install and are available at prices ranging from \$12 to \$30.



Using Your Generator Safely:

- Make sure your home is equipped with a battery-operated or battery back-up [carbon monoxide alarm](#).
- **Never operate a generator inside your home** or in other enclosed or partially-enclosed spaces. Generators can very quickly produce high levels of [carbon monoxide \(CO\)](#), which can be deadly.
- Opening doors and windows or operating fans to attempt to ventilate a generator **will not prevent carbon monoxide build-up** in the home. Even with a



working CO alarm, you should never use a gasoline-powered generator inside your home or in a garage.

- ESFI recommends positioning the generator at least 25 feet **outside the home** and away from doors, windows and vents that can allow CO to enter.
- **Carbon Monoxide is the "silent killer."** Don't take chances. Get to fresh air right away if you feel dizzy or weak.
- Do not **overload** the generator.
- Do not use a generator in **wet conditions**.
- Plug appliances **directly** into the generator or use a heavy-duty, outdoor rated extension cord.



- Make sure extension cords used with generators are **rated for the load** and have **three-pronged plugs**. They should be **inspected for damage**, such as cuts and/or worn insulation before use.
- **Turn off** all appliances powered by the generator **before** shutting down the generator.
- Make sure fuel for the generator is **stored safely**, away from living areas, in properly labeled containers, and away from fuel-burning appliances. Before re-fueling, always **turn the generator off** and let it cool down.
- **Keep children away** from portable generators at all times.
- A generator is a **temporary power source**. Use a generator only when necessary to power essential equipment or appliances.
- Warn those in your home not to open windows while a generator is operating outside.

Be sure to watch ESFI's [generator safety videos](#) for more information to help you power up safely during an outage.

Downed Power Lines:

In the aftermath of a major storm, be aware of hazards presented by downed power lines. Downed power lines can carry an electric current strong enough to cause serious injury or even death. If you come across a low or fallen line, adhere to the following safety tips:



Safety Tips

- If you see a downed power line, **move away from it** and anything touching it. The ground around power lines – up to 35 feet away - may be energized.
- You cannot tell whether or not a power line is energized just by looking at it. You should **assume that all downed power lines are live**.
- The proper way to move away from the power line is to **shuffle away with small steps**, keeping your feet together and on the ground at all times. This will minimize the potential for a strong electric shock.
- If you see someone who is in direct or indirect contact with the downed line, **do not touch the person**. You could become the next victim. Call 911 for help.
- **Do not attempt to move a downed power line** or anything else in contact with it by using an object such as a broom or stick. Even non-conductive materials like wood or cloth, can conduct electricity if even slightly wet.
- Be careful **not to touch or step in water** near where a downed power line is located.
- **Do not drive over** downed power lines.
- If your car comes in contact with a downed power line while you are inside, **stay in the car**. Honk your horn to summon help, but direct others to stay away from your car.
- If you must leave your car because it is on fire, jump out of the vehicle with both feet together and **avoid contact with both the car and the ground** at the same time. Shuffle away from the car.