TDI Safety @ Work
Division of Workers' Compensation

Thunderstorm Safety Fact Sheet

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In Texas, the hot spring and summer months, in particular, may bring unwanted weather patterns such as severe thunderstorms that can wreak havoc on businesses and homes. Heavy rains, strong winds, hail, and lightning from these thunderstorms can cause flash flooding, power outages, and structural damage. Thunderstorms can also produce dangerous tornadoes, which are among the most violent weather occurrences on the planet.[1]

According to the National Weather Service (NWS), severe thunderstorms are defined as storms producing hail an inch or more in diameter or wind gusts over 58 miles per hour (mph).[2] As potentially dangerous as this is, some thunderstorms produce even larger hail – some bigger than softballs – and winds over 100 mph. With these hazards in mind, it is vital to watch and prepare for severe weather.

Advanced warning is the key to saving lives!

Always keep a backup battery communication system, such as a National Oceanic and Atmospheric Administration (NOAA) Weather Radio, available to stay up-to-date on storm advisories. Also, listen for lifesaving wireless emergency alerts available automatically on cellphones to quickly prepare for potentially dangerous conditions. Finally, always keep extra batteries and portable power chargers available to stay connected and informed before, during, and after the storm.

Thunderstorm WATCHES versus Thunderstorm WARNINGS

Thunderstorm WATCH: PREPARE!

A severe thunderstorm **watch** means to **prepare** for severe weather and listen to local weather advisories to know when warnings are issued. Alerts are issued by the NOAA Storm Prediction Center when conditions are favorable for severe thunderstorms. A watch can cover parts of a state or several states.

Thunderstorm WARNING: ACT!

A severe thunderstorm **warning** means there is a **serious threat** to life and property to those in the path of the storm. **Act immediately to find safe shelter!** The local NOAA NWS Forecast Office issues thunderstorm warnings when severe weather is reported by spotters or indicated by radar.

- Create an emergency "go bag."
- Monitor local weather stations during thunderstorms.
- Develop an evacuation plan and know where all the routes are.
- If emergency managers say to evacuate, do so immediately!

Thunderstorm Hazards and Safety Tips

At any given moment, there are roughly 2,000 thunderstorms in progress worldwide and about 100,000 thunderstorms each year in the U.S. alone.[3] According to NOAA, about 10% of these thunderstorms reach severe levels. Weather events associated with severe thunderstorms include:

Flash Flooding

Under the right conditions, rainfall from thunderstorms can cause flash flooding, which kills more people each year than hurricanes, tornadoes, or lighting.[4] Sudden downpours from thunderstorms can rapidly change the water levels in streams or creeks and turn small waterways into violent raging rivers. Urban areas are especially prone to flash floods due to the large amounts of concrete and asphalt surfaces that do not allow water to soak into the soil. Also, since water travels downhill at greater speeds, steep, hilly, rocky, or mountainous terrain worsens flash flooding. For instance, a mountain creek usually at 6 inches deep can swell to a 10-foot depth in less than one hour.[5]

Since flash flooding often happens with little warning, it is vital to prepare for these weather events during dry times to be prepared and ready to act.

- Stay away from low-lying areas, such as creeks, trails, ditches, ponds, and other drainage infrastructure.
- Do not drive through floodwater. About 75% of flood-related deaths in Texas occur in vehicles.[6] Remember, "Turn Around Don't Drown."
- Stay in the vehicle if surrounded by fast-moving water. Get out and move to high ground only if floodwater begins coming inside the vehicle.

Lightning

According to the U.S. Forest Service's wildfire database, lightning triggers 44% of wildfires across the Western United States.[7] In addition to fire damage, lightning is a major cause of storm-related deaths. Over the last 30 years, the U.S. has averaged 43 reported lightning fatalities per year.[8] These deaths are usually a result of cardiac arrest (the heart stops) at the time of injury. As for those who survive lightning strikes, they often suffer irreversible brain damage.[9]

To stay protected during lightning storms, follow these steps:

- Use the **30-30 Rule**. Count the seconds between seeing lightning and hearing thunder. If the time between the two is 30 seconds or less, seek shelter immediately.

- Find protection in a strong, sturdy building.
- Stay inside and away from windows.
- Lightning can travel long distances through metal. Therefore, stay away from metal objects, equipment, wiring, and surfaces that can conduct electricity.

Hail

Hailstones form when raindrops are carried upward by thunderstorm updrafts into extremely cold areas of the atmosphere and freeze. When the thunderstorm's updraft can no longer support the weight of the hailstone, the hail falls, usually at speeds between 44 and 72 mph.[10] These hailstones can result in damaged roofs, broken windows, and dented vehicles. Hail has also killed livestock, wildlife, and even people caught in the open.[11]

Always follow these safety tips if hail is in the forecast:

- Pull vehicles into a garage or another protected area.
- Stay inside and away from windows.
- If out, find shelter in a parking garage to wait out the storm.
- Never stop under bridges or overpasses for protection. Bridges give no safety from the strong winds that come with hail, and it may cause a car accident.

Strong Winds and Derechos

Strong straight-line winds (unlike rotating winds in tornadoes) have been reported at more than 100 mph during thunderstorms.[12] Air dragged down by moisture causes downbursts of strong winds. When the air reaches the ground, it spreads straight outward across the land's surface. These winds can knock down trees, power lines, and mobile homes. **Derechos**, long-lived windstorms associated with rapidly moving thunderstorms, can extend more than 240 miles and produce wind gusts as destructive as tornadoes. (See tornado safety tips below for ways to stay protected during strong winds and Derechos.)

Tornadoes

Thunderstorms can also produce tornadoes with recorded winds up to 300 mph.[13] When warm, humid air collides with cold, dry air, violently rotating columns of air can form, extending from the base of the thunderstorm to the ground. Tornadoes can uproot trees, hurl objects as heavy as cars, and destroy all but the best-built structures. On average, 132 tornadoes touch Texas soil each year.[14]

Tornadoes often bring extreme danger and plenty of damage in their path. However, these safety steps can provide protection from tornadoes and strong thunderstorm winds:

- Secure outdoor objects that could become projectiles if time allows.
- Monitor local weather conditions and be ready to act.
- Find shelter in a permanent building. Avoid mobile offices and trailers.
- Move to an interior room on the lowest level of the building. Basements, bathrooms, and closets are often the safest and strongest rooms.
- Never stop under bridges or overpasses. These offer no protection from high winds or flying debris.
- If no substantial structure is nearby, lie flat, face down in the nearest ditch or depression. Use hands to cover the head to protect against flying debris.

For more information on storm safety, download any of the Natural Disaster Preparedness and Recovery publications from the Texas Department of Insurance, Division of Workers' Compensation-Workplace Safety.

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