We are in the midst of spring severe weather season, so that means tornadoes are a likely threat. This issue will focus on tornadoes and following newsletters will highlight other natural disasters that we need to be concerned about throughout the year. The information that will appear in this issue of Health and Safety News and subsequent issues related to preparation were taken from The Homeowners Guide (http://www.homeownersinsurance.org/), so for reading more about the topics discussed, please visit the website. If there is a topic highlighted in blue that you would like to read more about, right click on the mouse and select Open Hyperlink.

Tornado Preparedness

A tornado can also be called a twister, and it is a violently rotating air column that touches both the earth’s surface as well as a cumulonimbus cloud. At other times, a tornado may also touch the actual base of a cumulus cloud. Tornadoes manifest
themselves in a myriad of both shapes and sizes. However, the most common form that a tornado can take is in the shape of a condensation funnel that is observable. Its narrow end also usually makes contact with the ground and is surrounded by a cloud of dust and debris.

**Tornadoes.... Nature's Most Violent Storms**

**How a Tornado Forms**

A tornado often starts its life through a group of thunderstorms that are known as supercells, which already contain mesocycles. A mesocycle is defined as a section of rotation that is orderly and which is found a few miles up in the atmosphere, commonly, one to six miles up. Supercells often birth the more aggressive types of tornadoes, which are the EF3 to EF5 on the Enhanced Fujita Scale. A tornado that comes from a supercell thunderstorm is usually identifiable through a well-defined lifespan that starts out with increased rainfall dragging down with it the rear flank downdraft, which is fast-descending air.

The rear flank downdraft also takes down with it the supercell’s mesocycle, and as this happens, a condensation funnel that is observable also looks like it is descending from the thunderstorm’s base. While this funnel is descending, the rear flank downdraft touches the ground, too, forming a gust front that has a tendency to cause a lot of damage even some distance away from the tornado. When the rear flank downdraft has reached the ground, it usually only takes a few minutes before the funnel develops into a full-fledged tornado.

- NOAA U.S. Tornado Climatology
- How Do Tornadoes Form

**Why a Tornado is Dangerous**

A tornado is dangerous because of all the very real damage it is guaranteed to cause. Similarly, a tornado can also occur at a moment’s notice, and this sudden onset characteristic of it also
contributes to its dangerousness. The great velocity of a tornado’s aggressive winds is another factor that establishes it as dangerous. Winds that are in excess of 300 miles per hour are those of an extreme tornado, but they can rip up trees from their roots, flatten houses, and even pick people up and then throw them for great distances.

The Fujita Scale

The Fujita Scale is a scale that is utilized for rating the intensity of a tornado. This scale is founded on the amount of damage that a tornado can wreak on vegetation and structures that are constructed by people. The Fujita Scale also uses a rating system that defines how much damage each different level of tornado can cause. The scale features an FO, F1, F2, F3, F4, F5 and theoretical F6 rating.

The FO rating is the weakest tornado that only causes minor damage like trees with branches broken off. The F1 rating is for a tornado that causes a moderate amount of damage, which includes peeling the surface off of roofs. The F2 rating represents a tornado that does a considerable amount of damage, and this refers to damage that includes the windows of highrise buildings being blown out. Severe damage is a characteristic of an F4 tornado, which features 260 mile per hour winds that can already level houses. An F5 rating indicates a tornado that achieves devastating damage; this is defined as the tornado having the potential to send car-sized missiles flying through the air. The final rating for a tornado is F6, but this is a highly theoretical rating for a tornado whose winds would already reach the speed of sound.

Family Education

The first step in educating yourself and your family on tornado preparedness is by having a family tornado plan in place. The family tornado plan is not one-size-fits-all; it must be based on the kind of home that is being lived in. Therefore, family tornado plans for people living in homes with a basement will differ from family tornado plans for people who live in a home without a basement, or in a mobile home. A family tornado plan should incorporate safety tips and also be practiced a few times per year.
How to Determine if Your Area is Prone to Tornadoes

The determination of whether an area is prone to tornadoes is based on the meeting of masses of cool and hot air, along with the type of land. In the United States, the proneness for tornadoes to happen in the Gulf states occurs around March, April, and May because of the meeting of hot and cool air. When the seasons shift from spring to summer, however, that tendency then also shifts from the Gulf states to more northerly ones. In the middle of the summer, places in the northern plain states become prone to tornadoes, again because the occurrence of warm and cool air meetings has shifted, too. To a lesser extent, flatter areas without mountains see a little bit more tornadoes since flat areas fail to be as successful as hilly ones in slowing down tornado winds.

How to Understand Tornado Warning Signs

Some local governments have retained the civil defense siren system that was originally used to warn people of air raids. With the threat of war now largely passed, these sirens have been repurposed and are used to warn people of impending natural disasters like tornadoes. Today in some municipalities, the tone of tornado sirens is set to the “Alert” feature, which sounds like a regular and steady note. When residents hear this tone from the siren, they know to take cover due to the inevitable tornado that is coming.

NOAA (National Oceanic and Atmospheric Administration) alerts are alerts that come from the National Weather Service, itself an agency of the NOAA. The alerts from the NOAA are broadcast through the federal government’s network of radio stations that are dedicated to continuously broadcasting information about the weather, including tornadoes. When the NWS has information about an impending tornado, for instance, in a certain area, then the warnings are passed through to local radio and TV stations. It is through the local NOAA Weather Radio stations in the tornado-affected area that the broadcast warning of the tornado is made.

- What are the signs of a tornado?
Safety of Homes

Some homes are safer than others with regards to tornadoes, which is why it is necessary to know the characteristics of various homes in tornadoes. For instance, mobile homes are always very hazardous places to stay inside of when a tornado touches down, so people living in them are advised to exit immediately. This may seem suicidal, but in reality, it is safer to look for shelter outdoors because of how easily a tornado (especially the stronger ones) can destroy mobile homes. People in houses with basements are advised to go into the basement, but avoid staying right beneath heavy furniture on the floor directly above them, as these may crash through a weakened floor. People in apartments and homes with no basements are advised to find a small room in the center of the home—like a bathroom—and then crouch as low as possible to the ground while shielding the face.

To get the most up-to-date information during a tornado threat, having a weather radio can be very beneficial. Information about the NOAA radio can be found at http://www.weather.gov/nwr/

How to Understand Signs of an Impending Tornado

It is important that people are independently able to notice the signs of a tornado since weather forecasting is not perfect and since tornadoes can occur abruptly. Some signs to look for include a heavy rain or hail that is then suddenly followed by a dead calm or a furious shift in the winds. Tornadoes sometimes “hide” in this sort of heavy precipitation and thus can’t be easily seen. Another tornado-imminent sign to look for includes the manifestation of very loud rumbling or roaring, which is different from mere thunder because it fails to fade away in a matter of seconds. This is an especially significant sign of a tornado if the roaring or rumbling occurs both day and night. Finally, if at night, it is possible to observe blue-green and small flashes at ground level when there is a thunderstorm close by, it could potentially mean that power lines are being destroyed by aggressive winds like those from a tornado.

Tornado Supply Kit

A tornado supply kit is a highly material way through which families can cope with the time when a tornado strikes, as well as the time immediately after it strikes. Like with all forms of preparation, this tornado supply kit should be prepared before a tornado strikes, kept in an
accessible place, and mobile enough to be taken along with you if there is a need for an evacuation. Since there is no time or opportunity to shop for supplies during and maybe even after a tornado (at least for a period of time), having a tornado supply kit on hand before a tornado occurs is critical. With a tornado supply kit, families should be able to endure both an evacuation as well as a possible home confinement if the tornado has ruined the area.

A basic tornado supply kit will make it a point to take care of obtaining a multitude of provisions that will make it easier to cope. Food and water are obvious inclusions, and this means ready-to-eat canned goods like SPAM, high-energy foods like trail mix or granola bars, staples like pepper and salt, soup and canned juices, and fresh, filtered water that is being stored in plastic containers such as soft drink bottles. An entire first-aid kit should also be part of the tornado supply kit, and this includes items like tweezers, gauze pads, bandages, a thermometer, antiseptic, moistened towelettes, lubricant like petroleum jelly, sunscreen, latex gloves, and non-prescription drugs like over-the-counter aspirin. Basic tools should also be a part of any good tornado supply kit. These basic tools can be items like pliers, a compass, tape, pen and paper, pencil, a signal flare, needles, some thread, plastic sheeting, a small canister-type of fire extinguisher, a flashlight with some extra batteries, plastic utensils, paper cups, and even a radio that is battery operated.

The supplies in a tornado supply kit don’t end there. Other essentials that can be included are items for sanitation, which would include objects like toilet paper, disinfectant, chlorine bleach, soap, toothbrush, toothpaste, and plastic garbage bags. Clothing and bedding items like rain gear, hats and gloves, work boots or other heavy-duty shoes, sunglasses, sleeping bags, blankets and thermal underwear are also recommended as part of the kit. More unconventional items to include inside of a tornado supply kit include important documents like special papers. This can include things like a will, stocks and bonds, deeds, contracts, insurance policies of various kinds, records of family health immunizations, social security cards, passports, bank account numbers, credit card account numbers, family records that comprise marriage certificates, birth certificates, and death certificates, and an inventory of all the goods in the household that are of value. These very important papers, records and documents should be stored inside a safe place that is durable, like a portable container that is waterproof.

- FEMA Disaster Kit

What To Do During a Tornado

During a tornado, the most important course of action that families can take is to find shelter immediately, especially if a tornado warning has been issued already. If a family is in a
structure—whether that structure is a home, building, school, or hospital—then they should proceed to a shelter area that should have already been pre-designated. If a structure possesses no basement, then proceed to a center room on the lowest level of the structure and stay as far away as possible from doors, windows, or corners. If a family finds themselves in a mobile home, they are advised to leave it immediately and find shelter in a proper structure or a real storm shelter. If they find themselves in the worst case scenario—such as outside with no shelter around at all—families should find a depression or ditch and then lie flat and cover the head. If a family is driving in a vehicle when a tornado strikes, they should instantly abandon the vehicle and find proper safe shelter.

For information about how to protect yourself and your family while in various places, see the information below taken from the Storm Prediction Center in Norman, Oklahoma (http://www.spc.noaa.gov/faq/tornado/safety.html):

**WHAT TO DO...**

- **In a house with a basement:** Avoid windows. Get in the basement and under some kind of sturdy protection (heavy table or work bench), or cover yourself with a mattress or sleeping bag. Know where very heavy objects rest on the floor above (pianos, refrigerators, waterbeds, etc.) and do not go under them. They may fall down through a weakened floor and crush you.

- **In a house with no basement, a dorm, or an apartment:** Avoid windows. Go to the lowest floor, small center room (like a bathroom or closet), under a stairwell, or in an interior hallway with no windows. Crouch as low as possible to the floor, facing down; and cover your head with your hands. A bath tub may offer a shell of partial protection. Even in an interior room, you should cover yourself with some sort of thick padding (mattress, blankets, etc.), to protect against falling debris in case the roof and ceiling fail.

- **In an office building, hospital, nursing home or skyscraper:** Go directly to an enclosed, windowless area in the center of the building -- away from glass and on the lowest floor possible. Then, crouch down and cover your head. Interior stairwells are usually good places to take shelter, and if not crowded, allow you to get to a lower level quickly. Stay off the elevators; you could be trapped in them if the power is lost.

- **In a mobile home:** Get out! Even if your home is tied down, you are probably safer outside, even if the only alternative is to seek shelter out in the open. Most tornadoes can destroy even tied-down mobile homes; and it is best not to play the low odds that yours will make it. If your community has a tornado shelter, go there fast. If there is a sturdy permanent building within easy running distance, seek shelter there. Otherwise, lie flat on low ground away from your home, protecting your head. If possible, use open ground away from trees and cars, which can be blown onto you.
**At school:** Follow the drill! Go to the interior hall or room in an orderly way as you are told. Crouch low, head down, and protect the back of your head with your arms. Stay away from windows and large open rooms like gyms and auditoriums.

**In a car or truck:** Vehicles are extremely dangerous in a tornado. If the tornado is visible, far away, and the traffic is light, you may be able to drive out of its path by moving at right angles to the tornado. Otherwise, park the car as quickly and safely as possible -- out of the traffic lanes. [It is safer to get the car out of mud later if necessary than to cause a crash.] Get out and seek shelter in a sturdy building. If in the open country, run to low ground away from any cars (which may roll over on you). Lie flat and face-down, protecting the back of your head with your arms. Avoid seeking shelter under bridges, which can create deadly traffic hazards while offering little protection against flying debris.

**In the open outdoors:** If possible, seek shelter in a sturdy building. If not, lie flat and face-down on low ground, protecting the back of your head with your arms. Get as far away from trees and cars as you can; they may be blown onto you in a tornado.

**In a shopping mall or large store:** Do not panic. Watch for others. Move as quickly as possible to an interior bathroom, storage room or other small enclosed area, away from windows.

**In a church or theater:** Do not panic. If possible, move quickly but orderly to an interior bathroom or hallway, away from windows. Crouch face-down and protect your head with your arms. If there is no time to do that, get under the seats or pews, protecting your head with your arms or hands.

**What To Do After a Tornado**

The very first concern after a tornado hits should be to look after your own family by evaluating potential safety issues as well as checking on their well-being and health. With regards to both well-being and health, do check to see if anyone in the family is injured and in need of first-aid treatment. If a family member does show signs of being injured, do not attempt to move them at first; if they show signs of impending death or worsening injury if they are not moved, then do try to move them, but make sure to always support both their head and neck. If a family member who is injured is also not breathing, then find someone who can attempt to resuscitate them through the use of mouth-to-mouth. During this time you should also look after your own safety, since after a tornado strikes, there are more safety concerns created by the tornado. These include possibly washed out roads, infected water, contaminated buildings, broken glass, gas leaks, floors that are slippery, and electrical wiring that has been damaged.

After a tornado has struck, there will be lots of debris scattered all over the place, so wait for word from local authorities until it is safe for a return. Because returning home (in the event that you were able to evacuate the tornado), is mentally and physically draining, you should use caution. In the return to the residence, it is a prudent idea to bring along a battery-powered radio that can be utilized to listen for any emergency updates and tornado-related news alerts in
general. Also bring along a battery-powered flashlight that can be used to inspect the home for damages, but said flashlight must be turned on before entering the home to prevent any possible ignition of leaking gas due to the batteries producing a spark. If the residence is in an area that is particularly woodsy or rural, dangerous animals like snakes and other pests may have crawled into the home to seek shelter after the tornado. For this reason, it is recommended that returning people carefully use long objects like sticks in order to poke through debris and not get surprised by snakes and other pests.

Once inside the home after a tornado, be mindful of slippery floors and loose boards that can trip people. Check the natural gas if there is a hissing sound or if there is gas in the air, and turn off the main gas valve from the outside. Check the appliances, too, and if they are wet, turn the electricity off at the main fuse box. Finally, families should attend to any potential household chemical spills like those that stem from bacteria contaminations or raw sewage spills. In the case of chemicals, bacteria, or raw sewage contaminating any household items, simply clean them by using good disinfectant. If there are any household items that are salvageable, then they should definitely be cleaned and disinfected as well.