Fast Facts About Lightning

From the National Lightning Safety Institute, www.lightningsafety.com

+ NLSI is an independent and non-product consulting/educational group concerned with lightning safety issues. We conduct several types of education seminars. We perform site audits and we inspect facilities to assure “best available technology” for lightning safety. We represent no special interest groups or vendors.

+ Lightning comes from thunderstorms (and snowstorms and volcanoes). Lightning is static electricity gone giant-scale. There are some 2,000 thunderstorms globally at any one time, producing some 75-100 lightning strikes to earth per second. In the U.S., there are about 20-25 million ground strikes per year. Florida has the most strikes in the U.S. — about 12 strikes per square kilometer per year in some places. On average, more people are killed by lightning than any other weather event. There is more than $4-$5 billion damage annually in the U.S. from lightning.

+ Your risk of being killed by lightning is 1:28,500 per exposed individual. (NPH Newsletter, January 1992)

+ The average flash will light a 100-watt bulb for more than three months.

+ Lightning’s heat exceeds 50,000 degrees Fahrenheit or five times hotter than the surface of the sun. Its speed is 90,000 miles per second (one hundred million feet per second). The average thickness of a bolt is 1-2 inches.

+ It’s wrong to say lightning can be “stopped” or prevented. It is a totally capricious, stochastic (look that up!) and unpredictable event. It’s the 800-pound gorilla come to visit. Safety for structures is obtained by applying a code-driven series of defenses, such as air terminals, bonding, grounding, shield, surge protection, and maintenance of the above. It’s a very site-specific engineered system.

+ Thunder is always associated with lightning. Thunder is the shock wave created by super-heated air in the lightning channel. We typically see lightning up to about 8-10 miles away, so when hearing thunder but not seeing lightning, you have a rough distance estimate of the hazard. For every five seconds from seeing the flash to hearing the bang, lightning is one mile away, which means for a count of 10, lightning is 2 miles away, for a count of 20, it is 4 miles away, etc.

+ Some good specialized publications on lightning are:

1. General Subject Matter:
   - Uman, M, “Lightning,” Dover, 1984.
   - Uman, M, “All About Lightning,” Dover, 1986.
   - Viemeister, P, “The Lightning Book,” MIT, 1972.

2. Medical Subjects:
   - Seminars in Neurology, Parts I & II (Sept & Dec 1995)

3. Thunderstorms:
   - Kessler, E “Thunderstorms, A Social, Scientific, and Technological Documentary,” University of Oklahoma Press, 1992.

4. General Weather:
   - Williams, J, “The Weather Book,” Vintage Books, 1992.

5. Weird Weather Phenomena:
   - Corliss, W “Lightning, Auroras, Nocturnal Lights and Related Luminous Phenomena,” Sourcebook, 1992.

6. Technical Book:
   - NLSI’s “Lightning Protection for Engineers,” 2007

+ Nine out of ten people struck by lightning survive the event. But nearly 25% of these survivors suffer long-term psychological or physiological trauma. The best defense against lightning is preparedness.

+ What’s good about lightning? It produces a lot of the nitrogen compounds that are important for plant growth. It provided early man with his only source of fire. It’s better than fireworks on the Fourth of July and it’s free!

+ The average lightning strike contains 20,000 amps. An arc welder uses 250-400 amps to weld steel. Your house probably uses only 200 amps. Current in excess of 20 milliamps can cause your chest muscles to contract, stopping breathing.

+ The worst lightning incident (so far) in the U.S. was in New Jersey on July 10, 1926. A Navy ammunition arsenal was hit, killing 19 people and destroying property valued at $17 million (1986 dollars). Usually, single events caused by lightning are less dramatic than single events caused hurricanes, floods or tornadoes. If you are the victim, however, it is plenty dramatic.

+ It’s wrong to say lightning never strikes twice. It hits the Empire State Building, on average, 21-25 times per year. A U.S. Park Service Ranger, Ray Sullivan, was struck by lightning seven different times between 1942 and 1976. Yes, he survived them all. (We don’t know if his hair was curly.)

+ Beware of sheltering under tall trees during a storm. (Trees contain some 20% moisture content. We humans have 65% moisture content.) Lightning coming down a tree wants to follow the path of least resistance —Tag, you’re it! Get to an all-metal vehicle, like a car or a truck, if you can. That’s the safest place. When in a totally exposed place (mountain top, open field, etc.), separate yourself from others to reduce multiple injuries, duck down into a “baseball catcher’s” position…and if you pray, that’s a good time to do it!