



California Southern Region

# Safety Bulletin

## California Southern Region

*Issue Date:* June 28, 2004      *Issue No.* 06-02

*Topic:* Lightning, Thunder and Micro-burst Storm Activity

***Incident Types:*** Wildland and Wildfire-Urban Interface Situations

***Type of Work Activity:*** Fire Suppression Coupled with Volatile Fuels, and Extreme Fire Behavior

**Discussion:** Thunderstorms most often occur in the afternoon and evening hours, and are least likely to occur in the

Firefighters should be reminded that any thunderstorm activity near the area of your incident could adversely affect fire behavior, and hamper firefighting activities.

Microbursts (also known as downbursts) are powerful downdrafts associated with thunderstorms. Identification of Microbursts has resulted from the investigation of wind shear aircraft related accidents and from meteorological research. But, what is wind shear? Wind shear is any rapid change in wind direction or velocity that can result from a large variety of meteorological conditions, temperature inversions, sea breezes, frontal systems, strong surface winds and thunderstorms. Severe wind shear is a rapid change in wind direction or velocity causing airspeed changes greater than 15 knots (~17mph) or vertical speed changes greater than 500 feet per minute (around 5-6 mph in the vertical direction).

Microbursts can occur anywhere convective weather conditions (thunderstorms, rain showers, and particularly hail or virga) occur. Virga is rain that evaporates before it reaches the ground and is associated with a dry Microburst. The weight of large hail can accelerate downward winds to very high velocities as it falls from the upper levels of the atmosphere. Both, hail and virga, contribute also to accelerate the downdraft as they evaporate while falling thus cooling the environment and increasing the weight of the falling air mass. Observations suggest that approximately five percent of all thunderstorms produce a microburst and significant wind damage can be related to them. Although micro-bursts are more common in the West, they certainly occur in the Southeast.

Downdrafts associated with Microbursts are typically only a few hundred to a few thousand feet across. When the downdraft reaches the ground, it spreads out horizontally and may form one or more horizontal vortex rings around the downdraft. The outflow is typically 6-12 thousand feet across and the vortex ring may rise 2 thousand feet above the ground.

As a result of current drought conditions resulting in precipitation levels ranging from 0-40% of normal, fire fuels and ERCs (Energy Release Components) throughout the Southern Region are simulating conditions normally not seen until late fire season.

The majority of recent fire activity that has occurred within the State over the past few months has been primarily fuel driven. Predicted thunderstorms coupled with microburst and/or erratic winds present the possibility for increased fire activity throughout eastern part of California.

**Summary:**

Recently observed fire behavior, existing fuel and drought conditions, along with forecasted weather indicate above-normal potential for large fire activity and extreme fire behavior throughout the eastern portion of California.

**Lookouts...Communication...Escape Routes...Safety**



California Southern Region

# Safety Bulletin

## California Southern Region

*Issue Date:* June 28, 2004      *Issue No.* 06-02

*Topic:* Lightning, Thunder and Micro-burst Storm Activity

**Incident Types:** Wildland and Wildfire-Urban Interface Situations

**Type of Work Activity:** Fire Suppression Coupled with Volatile Fuels, and Extreme Fire Behavior

### Safety Reminders:

- ✓ Review “Lookouts, Communications, Escape Routes, and Safety Zones.”
- ✓ Review the “**10 Standard Fire Orders**”, “**18 Situations**”, “**LCES Checklist**” and “**Common Denominators of Fire Behavior on Tragedy Fires**”
- ✓ Review Wildland-Urban Interface firefighting tactics and procedures for Structure Triage.
- ✓ Expect erratic fire behavior.
- ✓ Maintain hydration and monitor your personnel for signs and symptoms of heat stress.
- ✓ Be aware of venomous reptiles and Africanized Honeybees

### In the Event of Lightning Activity the Following is Advised:

- ❖ In the event thunderstorm development is likely, it is advised that lookouts be posted and aware of signs of a developing storm.
- ❖ Do *not* lie down, the best position is sitting on the pack or crouching with feet close together.
- ❖ Avoid sitting directly on the ground, but if necessary, when sitting keep your feet and butt close together.
- ❖ Crouching for extended periods of time may not be feasible, you may sit on your pack, but do not use your shelter for support.
- ❖ Removing boots to allow stocking-covered or bare feet to improve or establish contact with the ground is a myth, and will not provide additional safety.
- ❖ Communication is vital to crew safety; the use of hand-held radios (with short rubber antennas), or cell phones is authorized.
- ❖ Wide-open spaces are safer than standing in, or near trees, clumps of trees, or bushes. Ridge tops, peaks, etc., should be avoided as well.
- ❖ If you feel the hair on your arms, or head “stand up,” there may be a high probability of a lightning strike(s) in the vicinity.

### Action Items:

- ✓ Ensure that your PPE is complete, serviceable, and “Combat-Ready.”
- ✓ Shrouds should be attached and secured.

**Lookouts...Communication...Escape Routes...Safety**



California Southern Region

# Safety Bulletin

## California Southern Region

**Issue Date:** June 28, 2004      **Issue No.** 06-02

**Topic:** Lightning, Thunder and Micro-burst Storm Activity

**Incident Types:** Wildland and Wildfire-Urban Interface Situations

**Type of Work Activity:** Fire Suppression Coupled with Volatile Fuels, and Extreme Fire Behavior

### Action Items (continued):

- ✓ Boots should be examined to ensure that leather uppers are intact, all excess oils are removed, and that laces soles and lugs are in good shape
- ✓ All web gear should be inspected for completeness and serviceability.
- ✓ Fire Shelters should be examined for cracks, tears, permeations, or degradation. Review all deployment procedures and practice activating the shelter in simulated conditions (when training, consider the use of an electric, or gas powered blower to simulate wind conditions).
- ✓ Inspect water containers for leaks, rust, etc. Ensure that they are full of clean potable water and that there are sufficient amounts of drinking water for all emergency response unit personnel assigned.
- ✓ Inspect all food rations for dates, spoilage, and intactness, and again, ensure that there are sufficient amounts available.
- ✓ Examine Portable Radios and determine reliability and check to ensure that they are operational. Check batteries, ensure that they are fully charged and remember to maintain fully charged spares. Inspect your radio frequencies to ensure that they are operational, and instruct your crew on use, proper radio communications, and maintenance.
- ✓ Inspect all hand and power tools for serviceability.
- ✓ Inspect Engine complement for serviceability and intactness.
- ✓ Maintain proper physical fitness and ensure that your crew maintains theirs. Remember to pace yourself and prevent against strains, sprains, and/or more serious injuries.
- ✓ Helmets and Goggles should be inspected to ensure that they are free of vision hampering defects and straps/ retainers are serviceable and in good working order. Headlamps should be inspected for serviceability and intactness.

### ***CDF Policy Review***

All CDF personnel should review Wildland Fire Detection Handbook 8600, Sections 8617 (Safety), and Section 8617.1.2 (Lightning).

**Lookouts...Communication...Escape Routes...Safety**