



California Department of Forestry and Fire Protection

**CAL FIRE**



## **“BACK to BASICS”**

**SOURCES:** CAL FIRE HB 4300; California and National Wildfire Coordinating Groups

“BACK” – *(as an adverb) meaning: to, toward, or in a place from which a person or thing came.*

“BASIC” – *(as an adjective) meaning: of, relating to, or forming the base or essence; fundamental.*

The opportunity to return to that which shaped and formed the foundation of our knowledge is often overlooked as something we are beyond or above. More often than not, however, it is those basic building blocks that, like with anything else, become foggy and forgotten when not regularly reinforced. How many times have we been asked to recite memorized “Orders” or “Situations” to demonstrate our knowledge and prove that, “we get it”? But egos, repetitiveness, and inconvenience aside, do we?

The challenge is that serious accidents continue at an alarming rate and the evidence is demonstrating that we are not always “getting it.” Time and time again, the failures to adhere to the fundamentals of firefighter safety are resulting in the direct contribution of serious injuries or the needless loss of a firefighter! We train for the real thing. We plan for the real thing. But do we understand how to provide for safety first before we aggressively fight the real thing? Is there a thorough understanding of Lookouts, Communications, Escape Routes, and Safety Zones? Do we fully understand that there are (at least) 18 Situations that Shout ‘Watch Out’ and 10 Standard Fire Orders to mitigate them? Are we aware that universal Operating Principles now exist for operations being conducted in the Wildland Urban Interface in California?

How else can we be certain that the fundamentals of firefighter safety are going to be the first consideration made in every strategy, tactic, and plan? How can we ensure the first operational thought on every employee’s mind will be the evaluation of their own personal safety and that of their crew before they carry out any control method?

Consider how we operate when given the direction, “hoselay.” We immediately process every step required in that operation and then quickly go to work. It is in that same automatic mental process that we must rely on our fundamental safety knowledge and be able to perform a rapid analysis of our environment and conditions ***before*** we act. Failing to do so can put yourself and your crew in a position of over commitment, unnecessary risk, and facing the potential of catastrophic results that can never be changed.

“Back to Basics” is the opportunity for each employee to review, refresh and recommit the building blocks of safety not just to memory but to comprehension. Perhaps this year, with a better understanding and a reprioritizing of providing for safety first and then fighting fire aggressively, it will truly be a season that ***“everyone goes home.”***

## **TEN STANDARD FIRE ORDERS**

### **FIRE BEHAVIOR**

1. Keep informed on fire weather conditions and forecasts.
2. Know what your fire is doing at all times.
3. Base all actions on current and expected behavior of the fire.

### **FIRELINE SAFETY**

4. Identify escape routes and safety zones, and make them known.
5. Post lookouts when there is possible danger.
6. Be alert. Keep calm. Think clearly. Act decisively.

### **ORGANIZATIONAL CONTROL**

7. Maintain prompt communication with your forces, your supervisor and adjoining forces.
8. Give clear instructions and insure they are understood.
9. Maintain control of your forces at all times.

### **IF YOU CONSIDER 1-9, THEN**

10. Fight fire aggressively, having provided for safety first.



## **Eighteen Fire Situations That Shout “WATCH OUT!”**

1. The fire has NOT been SCOUTED and SIZED UP
  - a. Use aerial recon
  - b. Use ground observations
  - c. Look for:
    - i. Fire size
    - ii. Fuel types and arrangement
    - iii. Topography
    - iv. Hazards
    - v. Safety Zones and Escape Routes
  
2. YOU are in country you have NOT SEEN IN DAYLIGHT!
  - a. Be alert for changes in fire behavior
  - b. Watch for nature’s danger signals
  - c. Keep informed on weather forecasts
  - d. Maintain communications with fireline supervisors
  
3. SAFETY ZONES and ESCAPE ROUTES have not been IDENTIFIED
  - a. Safety Zones
    - i. Void of vegetation
    - ii. Large enough to accommodate ALL personnel (4 times the flame height)
    - iii. Easy to deploy shelters (not in chimneys, saddles, or narrow canyons)
  - b. Escape Routes
    - i. Shortest distance to Safety Zone
    - ii. Relatively easy to travel
  - c. Make known to everyone
    - i. Visual markers
    - ii. Verbally
  
4. YOU are in an area where you are unfamiliar with local factors influencing FIRE BEHAVIOR!
  - a. Be alert for changes in fire behavior
  - b. Watch for nature’s danger signals
  - c. Keep informed on weather forecasts
  - d. Maintain communications with fireline supervisors
  
5. YOU are UNINFORMED on strategy, tactics, and hazards
  - a. Strategy: the overall plan to achieve the fire suppression objectives
  - b. Tactics: specific actions done to suppress the fire
  - c. Hazards:
    - i. Heavy fuel concentrations
    - ii. Chimneys
    - iii. Snags
    - iv. Falling operations
    - v. Firing operations

6. YOU have been given an assignment or instructions UNCLEAR TO YOU!
  - a. When given instructions, repeat them back, particularly if they are unclear
  - b. Know what you are supposed to do, before going on the line
  - c. Communicate with your supervisor
  - d. When possible, write down your instructions
  
7. YOU have NO communication link with crew members or supervisors.
  - a. Stay alert to changing conditions
  - b. Stay alert to problems developing
  - c. Stay alert to blow up conditions
  - d. Maintain control and prevent panic
  
8. YOU are constructing fireline WITHOUT a SAFE ANCHOR POINT!
  - a. Choose a point or location not currently, or likely in the future, to be threatened by fire spread
  - b. A place to begin your fireline where you're likely to hold your line
  
9. YOU are building a fireline downhill TOWARD A FIRE!
  - a. Have Escape Routes established
  - b. EXTREMELY dangerous situation
  - c. Stay with your crew
  - d. Post lookouts as necessary, be alert to conditions
  - e. Advanced fuels on upslope are pre-heated, will rapidly burn
  - f. Spot fires on upslope can be expected
  - g. Fire may generate momentum upslope and jump over hoselays or constructed hand lines
  
10. YOU are attempting a frontal assault on a fire
  - a. Watch for and suppress spot fires across road or line
  - b. Have established Escape Routes
  - c. Do not wander into the green at an oncoming fire, wait until it gets to where you are supposed to attack it
  - d. Follow orders
  - e. Be alert
  
11. YOU are in heavy cover with unburned fuel BETWEEN YOU and the FIRE!
  - a. EXTREMELY dangerous situation
  - b. Always requires that lookouts be posted at strategic points for constant observation
  - c. Line should be burned out behind you as it is being constructed
  - d. Be in constant communication with your fire line supervisor
  - e. Be prepared to use Escape Routes immediately
  
12. YOU can not see the main fire and you are not in communication WITH ANYONE WHO CAN!
  - a. A dangerous situation at any time
  - b. Area should be thoroughly scouted
  - c. Post a lookout or lookouts as necessary
  - d. Be weather alert
  - e. Obey your supervisor

13. YOU are fighting fire on a hillside where rolling fire can ignite fuel BELOW YOU!
  - a. Properly construct trenches on slopes to hold rolling material
  - b. Have established Escape Routes, know where they are
  - c. Cut your way into spot fires, don't just walk through the green
  - d. Post lookouts as necessary
  
14. YOU feel the weather getting HOTTER and DRIER!
  - a. There will be a decrease in fuel moisture and humidity
  - b. Fuels will burn faster
  - c. Watch for increase in hot spots appearing on the fire line
  - d. Be alert to changes in fire behavior
  
15. YOU notice that the wind begins to blow, increase, or CHANGE DIRECTION
  - a. Fire may begin to spread in a different direction
  - b. Your method of attacking and approach may now need to be changed
  - c. Be alert, post lookouts as necessary
  - d. Observe for changes in fire behavior
  
16. YOU are getting frequent spot fires OVER YOUR LINE!
  - a. This is an indication fire conditions and weather are changing
  - b. Don't become trapped between two fires
  - c. If spot fires are taking off, this indicates lower fuel moisture
  - d. Be alert to what is happening around you
  
17. YOU are away from a burned area where terrain and/or cover make travel SLOW and DIFFICULT!
  - a. Know where the fire is at all times
  - b. Know where you are going
  - c. Stay as close to the burn as possible
  - d. Don't bunch up, spread out, and be alert for rolling rocks towards firefighters below
  
18. YOU feel like taking a nap NEAR THE FIRELINE!
  - a. Sleep in shifts if necessary
  - b. Sleep as a group and sleep only with permission from your fire line supervisor
  - c. Don't wander off from the crew, stay together
  - d. Never sleep in the green, always in the burn
  - e. Post a lookout to stay awake and protect crewmembers from fire

# LCES

LCES- A system for Operational Safety. In the wildland fire environment, where four basic safety hazards confront the firefighter - lightning, fire-weakened timber, rolling rocks, and entrapment by running fires - LCES is key to safe procedure for firefighters. LCES stands for "lookout(s)", "communication(s)", "escape routes", and "safety zone(s)" - an interconnection each firefighter must know. Together the elements of LCES form a safety system used by firefighters to protect themselves. This safety procedure is put in place before fighting the fire: select a lookout or lookouts, set up a communication system, choose escape routes, and select safety zone or zones. (See diagram)

In operations, LCES functions sequentially - it's a self-triggering mechanism: lookouts assess - and reassess - the fire environment and communicate to each firefighter threats to safety; firefighters use the escape routes and move to safety zones. Actually, all firefighters should be alert to changes in the environment and have authority to initiate communication.

**Key Guidelines.** LCES is built on two basic guidelines:

Before safety is threatened, each firefighter must be informed how the LCES system will be used.

The LCES system must be continuously reevaluated as fire conditions change.

**How to make LCES work**

Train lookouts to observe the wildland fire environment and to recognize and anticipate fire behavior changes.

Position lookout or lookouts where both the hazard and the firefighters can be seen. (Each situation - the terrain, cover, and fire size - determines the number of lookouts that are needed. As stated before, every firefighter has both the authority and responsibility to warn others of threats to safety.)

Set up communications system - radio, voice, or both - by which the lookout or lookouts warn firefighters promptly and clearly of approaching threat. (Most often the lookout initiates a warning that is sub-

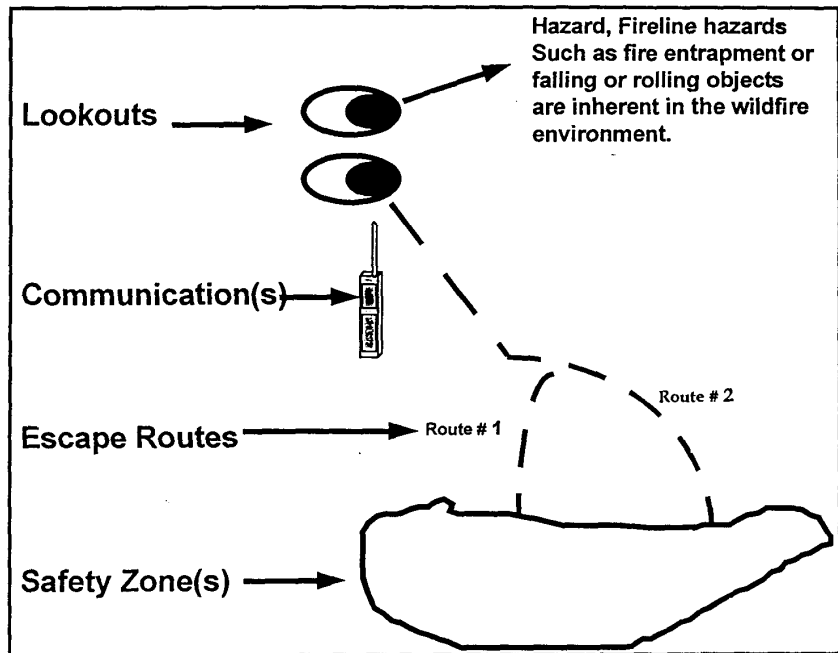
sequently passed down to each firefighter by "work-of-mouth". It is paramount that every firefighter receive the correct message in a timely manner.)

Establish the escape routes (at least two)- the paths the firefighters take from threatened position to area free from danger- and make them known. (In the Battlement Creek 1976 fire, three firefighters lost their

not imply that a shelter would not be deployed if needed, only that if there is a deployment, the safety zone location was not truly a safety zone.)

**A Final Word**

The LCES system approach to fireline safety is an outgrowth of my analysis of fatalities and near misses for over 20 years



lives after retreat along their only escape route was cut off by the advancing fire.)

Reestablish escape routes as their effectiveness decreases. (As a firefighter works along the fire perimeter, fatigue and distance increases the time required to reach a safety zone.

Establish safety zones - locations where the threatened firefighter may find adequate refuge from the danger. (Fireline intensity, air flow, and topographic location determine a safety zone's effectiveness. Shelter deployment sites have sometimes been termed, improperly and unfortunately, "safety zones". Safety zones should be conceptualized and planned as a location where no shelter will be needed. This does

of active fireline suppression duties. LCES simply refocuses on the essential elements of the standard FIRE ORDERS. Its use should be automatic in fireline operations. All firefighters should know LCES, the Lookout-Communication-Escape routes-Safety Zone interconnection.

Paul Gleason, North Roosevelt Fire Management Officer, USDA Forest Services, Arapaho and Roosevelt National Forests, Redfeather Ranger District, Fort Collins, CA, *Fire Management Notes*. 1991 Volume 52, Number 4



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## **Wildland Urban Interface Operating Principles**

1. The first priority for all risk-decisions is human survival, both of firefighters and the public.
2. Incident containment strategies specifically address and integrate protection of defensible improved property and wildland values.
3. Direct protection of improved property is undertaken when it is safe to do so, when there are sufficient time and appropriate resources available, and when the action directly contributes to achieving overall incident objectives.
4. The firefighter's decision to accept direction to engage in structure protection actions is based on the determination that the property is defensible and the risk to firefighters can be safely mitigated under the current or potential fire conditions.
5. A decision to delay or withdraw from structure protection operations is the appropriate course of action when made in consideration of firefighter safety, current or potential fire behavior, or defensibility of the structure or groups of structures.
6. Firefighters at all levels are responsible to make risk-decisions appropriate to their individual knowledge, experience, training, and situational awareness.
7. Every firefighter is responsible to be aware of the factors that affect their judgment and the decision-making process, including: a realistic perception of their own knowledge, skills, and abilities, the presence of life threat or structures, fire behavior, availability of resources, social / political pressures, mission focus, and personal distractions such as home, work, health, and fatigue.
8. An individual's ability to assimilate all available factors affecting situational awareness is limited in a dynamic wildland urban interface fire environment. Every firefighter is responsible to understand and recognize these limitations, and to apply their experience, training and personal judgment to observe, orient, decide, and act in preparation for the "worst case".
9. It is the responsibility of every firefighter to participate in the flow of information with supervisors, subordinates, and peers. Clear and concise communication is essential to overcome limitations in situational awareness.