



**Southern California Firestorm 2003**  
**Report for the Wildland Fire  
Lessons Learned Center**

*For:*  
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This report was prepared by two private consulting firms with the input of federal agency employees assisting the Wildland Fire Lessons Learned Center.



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**The following is an excerpt from the entire report. It is suggested that the reader also view the Introduction to the report to put this section into context.**

# Work-Rest Guidelines and Personal Safety

This section describes lessons learned regarding work-rest guidelines and personal safety.

## Initial Attack to Extended Attack

*If you rested, houses burned and people died.*  
Incident Commander

No other issue generated such strong agreement. Interviewees responded with one voice in saying that work-rest guidelines could not be implemented during the initial and extended attack phases that lasted up to 48 – 72 hours. Leaders at all levels reported that honest efforts were made to manage work and rest, but the enormity of these incidents, combined with the lack of ground resources and the values at risk, made it impossible to implement the guidelines.

According to firefighters, few replacement resources were available during the first 48 hours. Even when offered the opportunity, firefighters frequently would not leave while structures were still burning or lives were threatened. Firefighters tried to get rest as the situation allowed, but the fire intensity and values at risk required resources to remain engaged. After 72 hours, the initial resources were generally relieved as additional resources became available.

Incident commanders and overhead indicated that requirements of the Thirty Mile Abatement Plan were overly restrictive and that the work-rest guidelines were not practical in initial or extended attack under these kinds of conditions. Most felt that on incidents with adequate staffing, the 2:1 work-rest ratio is manageable, achievable, and even popular with many crew leaders. Under the conditions that these incidents occurred in, the universal view was it was not manageable or achievable. People said leaders need more flexibility to apply common sense and good judgment to adapt work-rest guidance without going through the cumbersome documentation process required now. Incident commanders said that this process, while important, should be streamlined.

In regard to disengaging in order to meet work-rest guidelines, nearly universally, respondents said things like, *Never considered it* or *No one even mentioned it* or *It was unspoken*. Leaders indicated that, by almost any standard, it was obvious that the work-rest guidelines could not apply during the early stages of these fires. They felt that because the policy is perceived as inflexible, it forced ICs and their staffs into the ethical dilemma of choosing between giving clear guidance that violated policy, or let it go “unspoken” and attempt to document it later.

Leaders said they felt they faced a no-win situation and as a result, firefighters were left to make their own, individual decisions about the same thing. Firefighters reported a great deal of ambiguity around the situation and uncertainty about whether their actions would be supported.

Eventually, some ICs said they recognized this problem and provided clear guidance to incident firefighters. In one case, work-rest requirements during the initial and extended attack periods (a set number of days) were waived. After the designated period, resources had to strictly adhere to the 2:1 work-rest ratio. This change in policy was clearly

communicated to everyone on the incident. When another subdivision was threatened shortly afterwards, the IC did not reengage firefighters. He reported that he had determined that they were just “too exhausted.” “It was the hardest decision of my life,” he said.

These leaders felt that the most practical approach would be a flexible policy that allowed leaders to make work-rest decisions at their level, as required by the situation during the initial and extended attack period (up to 48 hours), with a return to the 2:1 work-rest standard after that. Exceptions after the initial or extended attack period would require approval and thorough documentation.

Pilot duty limitations remained in force during the conflagrations. Most air and ground resource leaders interviewed felt that there was no shortage of air resources to justify exceptions to pilot work-rest ratios or flight duty limitations. Pilots expressed the importance of maximizing aircraft availability, turnarounds, and productivity during on-duty periods but still supported *timing out* as appropriate.

#### **Summary of Lessons Learned—Initial Attack to Extended Attack**

- The values at risk on these incidents made the current work-rest guidelines unrealistic during initial and extended attack. Few reinforcements were available for the first 48 hours to provide relief.
- The inflexibility of work-rest guidelines placed leaders in ethical dilemmas about how to proceed. Leaders were not sure how their actions would be supported. This left their decisions *unspoken* and resulted in a lack of clear guidance to tactical resources.
- Leaders reinstated the 2:1 work rest ration as soon as conditions permitted. In some cases they gave blanket approvals for exceptions up to a specific time and then gave clear guidance to all resources that normal work-rest guidelines were in effect.

## **Fatigue Management**

Most respondents reported difficulty in managing fatigue during initial and extended attack. Initially, no replacement resources were available, and later there was so much work to do that incoming resources were not available to replace others but were assigned to immediate needs. Units reached the point of physical exhaustion. Many firefighters worked 36 hours straight. Structural engines with only three people assigned were particularly stressed, until additional off-duty firefighters could be assigned. The addition of extra people to structural engine crews, allowing people to rotate out for brief periods of rest, proved to be an effective fatigue management tool.

Leaders reported coping by ensuring that vehicles were stocked with water and food. Senior leaders made sure that food was purchased and delivered to the resources on the fireground. Firefighters took advantage of catnaps while refueling or when they were nearing exhaustion. Ice chests were refilled, and firefighters drank and ate as they moved to the next location.

Leaders also reported they allowed crews to nap near the fireline during breaks in the action and mitigated the watchout situation by positioning lookouts.

### **Summary of Lessons Learned—Fatigue Management**

- Fatigue management was a serious issue during initial and extended attack. Leaders had to manage it based on the situation. This ranged from catnaps with lookouts posted to ensuring frequent hydration of firefighters.
- Assigning off-duty people to structural engines was an effective method for mitigating fatigue, especially for three person engines.

## **Personal Protective Equipment**

Facemasks or filters were ineffective in the dense smoke of urban areas. They would become clogged and quickly restrict air supply. Structural firefighters reported that the most effective protection offering adequate air supply was using the jacket collar and hood as a filter (even though it is unknown whether this filter provides effective protection from respirable products of smoke).

The use of quality goggles was reported as critical to keeping debris out of the eyes. One captain called this: “The difference between seeing the next day or being blind.” Structural units reported stopping frequently to purchase eye drops and using them continuously.

The increased amount of heat generated by involved structures in densely populated WUI areas was a serious risk to firefighters. Intense heat was cited by the California Department of Forestry and Fire Protection as a debilitating factor in the Green Sheet Initial Summary Report regarding the firefighter fatality on the Cedar Fire. Structural firefighters reported that being out on the street when fires moved through a densely populated WUI area was no different from what they experience when they are inside a fully involved structure. Several respondents reported that roof tiles on newer homes were exploding—“*pop-pop-pop* like firecrackers”—because of the intense heat and showering firefighters in the street with debris.

### **Summary of Lessons Learned—Personal Protective Equipment**

- Facemasks and filters were not effective in urban areas. Jacket collars and hoods were more effective (though probably offered little respiratory protection).
- Goggles and frequent use of eye drops were beneficial to firefighters exposed for long periods in WUI and urban areas.
- Intense radiant heat emanating from involved structures in WUI and urban areas was a significant watchout.

## **Smoke and Driving Conditions**

Smoke in the WUI was reported as very thick. Both structural and wildland engines reported that at times they managed to stay on the road only by the feel of the tires leaving the road. One firefighter said that he switched his watch to military time in order to know if it was day or night because he was so tired and there were no external references for judging time.

In older neighborhoods, firefighters said the smoke was acrid and contained hazardous materials including asbestos from older homes. Downed trees and power lines presented safety hazards on roadways. Fire behavior created violent, horizontal showers of sparks and embers that presented serious safety issues on open cab engines.

In one situation, a wildland engine parked under a palm tree when a flaming frond fell on the top of the engine and cut off the crew from using the engine's equipment. (Usually up to 1/3 of a palm tree's foliage is made up of dead fronds that weigh 10 to 15 pounds and often fall intact.) A neighboring engine had to put out the fire on the engine.

Respondents said that fallen trees, power poles, and other obstacles presented hazards and made it difficult to keep ingress and egress routes open. Using hand crews to keep roads open, leap-frogging them with engines was effective.

One structural battalion chief reported that, as a strike team leader on a wildland portion of an incident, his map and compass skills were not adequate. He mitigated the situation by putting a navigator with his vehicle. Wildland leaders also reported significant navigation problems staying oriented and weighing risk appropriately in unfamiliar WUI subdivisions. They recruited law enforcement officers, off-duty firefighters, and in some cases, local residents, to act as their navigators.

***Summary of Lessons Learned—Smoke and Driving Conditions***

- The smoke density caused visibility to approach zero. Firefighters had to navigate in extremely difficult conditions including downed trees and power lines and intense showers of sparks. Older homes generated acrid smoke containing chemicals and HAZMAT particulates.
- Palm trees presented a significant overhead threat to firefighting vehicles. Open cab engines faced a higher threat from ember attacks.
- Hand crews were used to leap frog with engines to make sure ingress and egress routes remained open.
- Incorporating local resources in strike teams or adding crew members from local departments to engines was an effective method of mitigating risks associated with a lack of local knowledge.

## Stress Management

*It is different when you are “the victim,” and it is traumatic to see your neighbors lose their homes. Need to keep control. Young people will need reassurance.*  
- IHC Superintendent

*We were taking some 911 calls from people with family members trapped by fire at a casino that was surrounded by flames. The cattle guards had burned out, so people could not drive out and were trapped with their families. Firefighters were spraying down the edges of roads in order to escort civilians out on other routes. They were close enough to have their headlamps melted on their engines.*  
- Dispatch Center Manager

Many respondents indicated that stress management was a major factor on these fires: not only from the fatigue management standpoint already discussed but also because the fires reached an unfamiliar level of intensity. Additionally, firefighters and support staff were constantly exposed to homeowners and evacuees while they were losing hundreds of structures and experiencing civilian and firefighter fatalities. Participants said the incidents extracted a high emotional toll from everyone.

Leaders reported how important it was to keep their people informed and keep them reassured. Communications breakdowns caused numerous false reports of burnovers and injuries. Many firefighters and support staff were also victims: their families had to be evacuated, and their houses were burning, but they could not help their families or stay abreast of the situation because they were fully engaged elsewhere. Some firefighters found out their homes had burned after coming off 36 hours of continuous operations. Leaders said that providing firefighters situation awareness about the status of their loved ones and neighborhoods was extremely important to enable them to keep functioning effectively.

On one incident, a Critical Incident Stress Debriefing (CISD) team was ordered on day two of the incident. The team organized as a drop-in center. Twenty to thirty people per hour visited the CISD team members. On another incident, roughly 1800 people took advantage of the availability of CISD staff to just release stress. Respondents referred to these as *Defusing Sessions*.

Leaders said they were faced with difficult decisions. When notified of a confirmed firefighter fatality and three injuries, the dispatch manager told the staff that four firefighters were injured and to coordinate the necessary evacuation missions. After the injured were rescued and the body recovered, the manager told the staff about the fatality. They all broke down sobbing. The manager reported that they were all so close to the edge by that point, “I was afraid none of us could function through the recovery [if they had known that one of the firefighters had died]. If one of them broke down, I would have gone next. I don’t know if I did the right thing or not.”

The unanimous assessment of all team members of the LLC Information Collection Team is that people still have a lot to discuss and that CISD efforts need to be ongoing during

this winter and spring. Data from similar incidents indicates that CISD services are important for up to two years after significant traumatic stress situations.

***Summary of Lessons Learned—Stress Management***

- Stress management was important. Providing situation awareness to local firefighters whose homes are threatened was crucial to enable them to manage personal stress.
- Ordering CISD teams early was beneficial. CISD teams organized group sessions and offered *walk-in* individual services as well. They kept services informal and routine to make people more comfortable.
- Firefighters said that leaders providing support and encouragement was important to their being able to remain focused in situations of increased risk.
- Experience shows that it is important to continue to provide employees with access to CISD services for up to two years after incidents of this nature.