

SAN BERNARDINO COUNTY
FIRE CHIEFS' ASSOCIATION
LESSONS LEARNED
REPORT
FIRE STORM 2003
"OLD FIRE"



Prepared by:
William F. Maxfield
Fire Chief, Retired

9-1-1 Consulting Group, Inc.
2605 Venezia Drive
Sparks, NV 89434
xchief@comcast.net

"THOSE WHO CANNOT REMEMBER THE PAST ARE CONDEMNED TO REPEAT IT".

George Santayana

TABLE OF CONTENTS

EXECUTIVE SUMMARY	3
ACKNOWLEDGEMENTS	3
STATISTICS OF THE "OLD FIRE"	4
CAUSE OF THE FIRE: ARSON	5
THE SHIFT FROM AN I-ZONE FIRE TO AN URBAN CONFLAGRATION	6
AFTER ACTION REVIEW WORKSHOP	19
WHERE DID ALL THE INCIDENT COMMANDERS GO?	25
DEVELOPING COMPETENT INCIDENT COMMAND OFFICERS	28
RECOMMENDATIONS	30
WILDLAND FIRE TRAINING CURRICULUM	30

"STUDYING HISTORY IS NECESSARY TO AVOID REPEATING PAST MISTAKES"

Fire Chief William Bagnell - 2004

EXECUTIVE SUMMARY

9-1-1 Consulting Group, Inc. (9-1-1CG) was retained by the San Bernardino County Fire Chiefs Association (SBCFCA) to prepare this report on the I-Zone fire which was named the "OLD FIRE" of the Southern California Fire Storm 2003. (I-Zone is defined as the urban/wildland interface)

ACKNOWLEDGEMENTS

9-1-1CG extends its appreciation to the SBCFCA as well as to all the participants who attended the two day Workshop on April 7th and 8th 2004 for their assistance in contributing the information necessary to develop this report.

The citizens of San Bernardino County are grateful for the firefighters and citizens whose efforts saved so many lives and communities. The dedication of all the Fire Service personnel, as well as the leadership of the SBCFCA is gratefully appreciated.

All associated parties who attended the two day Workshop were eager to participate in this process and cooperation was excellent. By working together, the SBCFCA and the participating emergency service agencies will be better prepared to deal with incidents in the San Bernardino County area.

The After Action Review Workshop was attended by members of Crest Forest Fire District; Running Springs; Big Bear City; Big Bear Lake; Redlands City, Rialto; San Manuel Reservation; the California Department of Forestry and Fire Protection (CDF); the US Forest Service; the San Bernardino County Fire Department, and the San Bernardino City Fire Department. The participants provided a great deal of information regarding "WHAT WORKED AND WHAT

DID NOT WORK". 9-1-1CG was impressed by the high level of candor, cooperation and professionalism exhibited by the Workshop participants.

The purpose of the AAR Workshop was to obtain and preserve the experiences of those who fought the "OLD FIRE". To capture the important lessons learned by the Incident Commanders as well as the on scene firefighters in the field, and learn how firefighting tactics and strategy, and other decisions were affected by an urban "conflagration" fire.

STATISTICS OF THE "OLD FIRE"

During the final days of October and the beginning of November, 2003, thirteen wildfires occurred in Southern California. One of these wildfires occurred in San Bernardino County and named the "OLD FIRE". The "OLD FIRE" created an I-Zone fire that impacted the residents of Crest Forest, Lake Arrowhead, Running Springs, and the city of San Bernardino. This fire will probable redefine the concept of the wildland urban interface fire. The SBCFCA has suggested there is a difference between a Wildland Urban Fire and a Wildland Conflagration.

On Saturday morning October 25th, 2003 and for the next eight days firefighters from Crest Forest, Lake Arrowhead, Running Springs, the California Department of Forestry and Fire Protection (CDF), the US Forest Service, the San Bernardino County Fire Department, the San Bernardino City Fire Department, many local fire agencies as well as Fire Service Agencies from Northern California, Arizona & Nevada were faced with the largest fire in California history.

Total Acres: 91,281 acres
12 injuries
940 homes destroyed
Dollar loss: \$37,650,000

Firefighters Assigned at Peak: 4,211
6 deaths
35 homes damaged
30 commercial properties destroyed

CAUSE OF THE FIRE: ARSON

The San Bernardino County Sheriff's Department is leading the arson investigation, which because of the deaths has been elevated to a murder investigation. The department released an artist's sketch of one of the suspects based on witness accounts. A white male in his early to mid 20s traveling in a 2000 or 2001 light gray Chevrolet or Dodge van with a full rear window.

PRE-FIRE ENVIRONMENTAL CONDITIONS

The environmental conditions that contributed to the "OLD FIRE" urban "conflagration" fire, in addition to the constant expanding of the wildland interface, included high fuel loads, long-term drought and a major tree mortality caused by an uncontrollable pine beetle insect infestation in the higher elevations, with chaparral to fuel the fire in the lower elevations. The fuel, weather, and topographic conditions that support the ignition and spread of wildland I-Zone fires are present within the area. The Santa Ana winds remained in their typical pattern of 30-40 mph. The area is in the High Fire Hazard rating and the conditions qualifying it as such are not expected to change in the near future.

The different type of fuels in the area contributed to the severity of I-Zone fire. All vegetation is flammable to some degree, including the structures and homes butting up to or scattered throughout these fuels. The intensity and speed at which vegetation burns depends upon the time of year, the fuel moisture, the weather, the topography, and the fuel size. Fuel loading is measured in tons per acre. Dry grass is considered a light fuel with approximately $\frac{3}{4}$ tons per acre. On the other end of the spectrum, thick brush, a heavy fuel, can have a volume of over 20-30 tons per acre. The intensity of the fire was directly related to fuel loading. The light, flashy fuels burned rapidly with a short period of intense, maximum heat output.

The decadent chaparral on the other hand, had a long sustained high heat output making it more difficult to control.

The participants acknowledge that the areas with good vegetation management programs and modern building codes survived much better than the areas with less restrictive building codes which allowed combustible roof covering and unprotected eaves. In addition, vegetation management areas which utilized 100' clearance instead of the recommended 30' survived at a greater rate.

THE SHIFT FROM AN I-ZONE FIRE TO AN URBAN CONFLAGRATION

The Old Fire burned beyond the wildland-urban interface into the residential area of the City of San Bernardino, into areas with little or no wildland fuels. However, embers from the main fire ignited spot fires in the various types of ornamental vegetation and other fuels which include landscaping features such as bark-mulch walkways and flower beds, and leaf litter accumulated in otherwise green plantings producing intense ember showers which caused additional spot fires. The flying embers from the wildland fire ignited spot fires in the urban zones by igniting structure fires on roof tops, through attic vents and unprotected eave spaces of houses, causing structure fires that threatened entire city blocks.

The intense heat generated by the many urban structure fires mandated that firefighters change firefighting tactics from the traditional "bump and run tactics" to "anchor and hold" which allowed the application of large quantities of water to involved structures that threatened entire blocks.

Lessons Learned

- As the fire moved from the wildland interface into the residential areas of the city; the structures became another fuel type which carried the fire deeper into residential areas.
- The various types of ornamental vegetation and other fuels such as landscaping features like bark-mulch walkways and flower beds produced a significant fuel source that blew into attic vents and eaves causing fire to spread throughout neighborhoods by torching, crowning, or distributing embers which caused additional structure and spot fires.
- The participants found that the "anchor and hold" tactic allowed the flow of large quantities of water which provided good heat control for preventing fire from spreading from structure to structure.
- The participants agreed that the use of modern Urban Wildland Interface Building codes were extremely effective.
- Areas with good vegetation management programs received less fire damage.
- Participants are convinced these types of fire will continue to happen and the activity of pre-incident planning should continue.

COMMUNICATIONS

One of the largest problems encountered on the OLD FIRE was the incompatible communications systems. Most California municipal and county fire departments use an 800 MHz radio communication system; which is

incompatible with the state and federal forest service UHF or VHF communications system.

Radio communication problems caused major coordination problems between cooperating agencies, command and tactical units, air and ground units, as well as engine companies on the same strike team. Firefighter safety was placed in unnecessary risk when engine companies became temporarily unaccounted for and were unable to communicate their status.

Communication issues prohibited effective situation awareness from flowing from resources to the unified command post. Unit leaders in the I-zone as well as in the urban environments could not determine when or where ordered resources were arriving.

Although cell phones were used to attempt to overcome communications problems, the cell systems became overloaded by the inordinate cell phone use. In addition, some areas lost cell towers or experienced power outages because of the fire.

LESSONS LEARNED

- The 800 MHz communications system is not compatible with the VHF and UHF systems.
- Lack of communications caused command and control to be severely disrupted and firefighter safety was jeopardized.
- Face-to-face meetings provided a reasonable effective means to resolve the part of the communication issue, but did not allow Group Leaders to stay in communication with subordinates.
- Command vehicles with VHF and UHF radios allowed leaders to be more effective than those without.

- The use of cell phones was somewhat effective in resolving communications problems; but they were unreliable if power failed or cell towers burned.
- Some cell phone networks became overloaded, which prevented calls.
- Some Units had Handi-Talkies but did not know how to program them.

INTERAGENCY COOPERATION AND TRAINING

For fourteen months prior to the "OLD FIRE", the SBCFCA had conducted joint training and interagency cooperation with all Mountain Fire agencies' Crest Forest Fire District; the California Department of Forestry and Fire Protection (CDF); the US Forest Service; the San Bernardino County Fire Department, and the San Bernardino City Fire Department. This interagency cooperation proved to be a significant factor in managing the fire.

As expected, the Incident Command System (ICS) worked as it was designed to function. It provided a common operational area which enabled participants to function effectively, even in the initial absence of an effective, unified command.

LESSONS LEARNED

- Pre-fire interagency cooperation set the stage and had a direct positive impact on the ability to manage the fire.
- The Incident Command System (ICS) worked as it was designed to function, and proved to be a valuable tool in facilitating interagency cooperation and establishing an effective unified command.
- Agencies that had trained together functioned more effectively as a unified command team, at the tactical level, and pre-incident planning.

- Structural unit leaders with wildland training were much more effective and safer as either a single resources or as members of a strike team operating in the I-Zone.
- Tabletop and simulation exercises proved to be a cost-effective way for incident preplanning and to build good working relationships.

JOINT INFORMATION CENTER AND INFORMATION MANAGEMENT

The SBCFCA recognize the need to establish a centralized multi-agency Joint Information Center (JIC). A centralized JIC will permit the public agencies to provide a proactive, unified message to the media and the community, which is critical in communicating the latest fire and evacuation information.

The SBCFCA also recognize that large, multi-agency incidents receive national and international attention and that an individual agency's public information officer will become inundated with requests for information very quickly. Therefore, the public information officers needed to think well beyond the customary everyday information officer's activities.

Lessons Learned

- Develop pre-identified and pre-designated JIC locations throughout the County.
- A properly staffed JIC can provide timely, quality information to the community, public and the media.
- Large fires receive national and international attention and the information request exceed the ability of a single agency.
- A JIC can provide a unified message to the community, public and the media.
- A JIC can be used to dispense pro-active fire prevention messages through out the year.

MOUNTAIN AREA SAFETY TASKFORCE (MAST)

The San Bernardino County Mountain Area Safety Taskforce (MAST) is a county organization made up of local, state, and federal government agencies, private companies, and volunteer organizations. One of the responsibilities of the MAST is assuring public safety through development of evacuation plans, vegetation management through hazard tree and fuel removal, pre-planning and public information. The MAST program was identified as a direct contributor to the success in the mountain communities.

The SBDCFCA agree that the MAST effort, including training and planning, saved a large number of lives and homes, as well as reduced the time required to establish an effective multi-agency, unified command.

ICS AND UNIFIED COMMAND TRAINING NEEDS

The SBCFC agreed that the Incident Command System (ICS) provided the critical foundation for trust between the agencies and assisted in effective interagency cooperation. The SBCFC also agreed those that had completed ICS training recognized its value and stated their knowledge of ICS had a positive affect on command and control; and their ability to interface with other agencies.

The SBCFCA discussed the need for firefighters to be able take independent action in a way that meets the IC's intent and will accomplish the incident objectives. They want the ICS to be flexible enough to allow for safe, effective action in the absence of communications or established command and control, and they want wildland and structural firefighting training to support this concept.

The SBCFC recognize that the general direction in the future will be toward functioning in a unified command due to an increase in large fires and the response to all-risk incidents. They see a need for ICS training to be provided to all agencies involved in emergency response, including private companies, volunteer support organizations and public utilities.

The SBCFC recommended that the appropriate issues identified in the AAR Workshop, be referred to the County Training Officers for action.

OLD FIRE

October 25 - November 4, 2003

- **Total Acres: 91,281**
- **Estimated Suppression Cost: \$37,650,00**
- **Firefighters Assigned at Peak: 4,211**
- **Residences Destroyed: 940**
- **Commercial Destroyed: 30**
- **Lives Lost: 6**

Communities Evacuated

Apple Valley	Lake Arrowhead
Arrowbear	Los Flores Ranch
Arrowhead Springs	Lucerne Valley
Baldy Mesa	Oak Hills
Blue Jay	Oak Springs Ranch
Cedar Glen	Rim Forest
Cedarpines Park	Running Springs
Crest Forest	San Bernardino
Crestline	Silverwood Lake
Del Rosa	Skyforest
Devore	South Hesperia
Green Valley Lake	Summit Valley
Highland	Twin Peaks
Holcomb Valley	Valley of Enchantment
Hook Creek	

- **Cause: Under Investigation**
- **Fuel Type: Medium to heavy brush and bug killed timber**

The Old Fire started at 9:16 am in Waterman Canyon above the City of San Bernardino and rapidly spread downhill threatening Arrowhead Springs Resort and then the community of Del Rosa. Strong gusty Santa Ana winds pushed the fire into the neighborhood west and east of Waterman Canyon (Highway 18). Firefighters were confronted by a dangerously fast moving fire with major spotting. Ignited palm trees fronds acted like torches of fire in the wind igniting numerous spot fires that threatened and burned homes. Two civilians died during the first evening. It was also burning up canyon driven by steep terrain and dry vegetation as the humidities dropped to six percent. This northern spread up the canyon would become a problem later when the Santa Ana winds subsided and the prevailing west winds arrived pushing the fire into the dead, dying and diseased forests of the San Bernardino National Forest and the many communities located there.

From the onset of the fire, unified incident commanders successfully used the Mountain Area Safety Task Force (MAST) planning effort for critical, strategic, and tactical decisions. The MAST effort proved critical to a successful evacuation effort when winds shifted and blew the fire into the mountain communities. 70,000 citizens were evacuated. The MAST project that had cleared dead trees from the evacuation routes proved successful as firefighters used these corridors for a major backfire in an attempt to keep fire out of the mountain communities. In spite of this there were significant numbers of homes destroyed in the Crest Forest, Crestline and Cedar Glen areas. Throughout the fire, local fire departments coordinated with the incident commanders and took action for the immediate protection of life and property within their jurisdictions. At the height of the fire over 4,000 firefighters were assigned to the fire and were successful in protecting over \$7.5 billion in residential and commercial infrastructure.

The major evacuation occurred overnight with no electricity to power lights or to power radios and TV's to help spread the word. In spite of these challenges, the evacuation went well, primarily due to preplanning efforts. The use of Therma-Gel and Fire-Out Ice, two fire resistant gels, was highly successful in protecting structures in Crestline and Rim Forest.

Chief Officers decided to order an additional Federal Team to prepare contingency lines between the Old Fire and the Big Bear, Oak Glen, Forest Falls and Angelus Oaks communities. By October 30, an Area Command was established to coordinate efforts between the Grand Prix Fire, the Old Fire and the contingency teams. Incident objectives were adjusted to take into consideration resource values at risk.

TIMELINE OF THE "OLD FIRE"

The Old Fire began at 9:30 a.m. Saturday along Old Waterman Canyon Road. A major concern was for the winds shifting and heading to the San Bernardino Mountains. Several homes have been lost in the Quail Canyon area of San Bernardino. As a precaution, officials are urging residents to review their evacuation plans. The San Bernardino Forest is closed to all except residents.

4:00 PM, Saturday October 25th, 2003: As of 3:00 p.m., the "Old Fire" has consumed in excess of 7,000 acres. The Santa Ana winds have pushed the fire south.

Mandatory evacuations were established West of Mountain Ave, East of Waterman Ave, South of the Mountains, North of 40th Street, North of Highland to Del Rosa, East to Boulder, and the Pine Irvington area West to Little League Drive.

An evacuation center was set-up at Norton Air force Base, located at 3rd Street and Del Rosa Avenue in San Bernardino, in terminal 1.

6:00 PM Saturday: There was concern the fire could threaten Crestline, so a Voluntary evacuation of Crestline was issued. Electricity to Crestline, Lake Arrowhead and Running Springs was interrupted.

10:00 PM Saturday: The fire hit the tree line in Crestline. It burned 10,000 acres and had taken 300 homes in San Bernardino city, with homes being burned in the Crestline area. Electricity to Crestline, Lake Arrowhead and Running Springs has been interrupted; so the voluntary evacuation of Crestline, Lake Arrowhead, Blue Jay, Cedar Pines, Sky Forest and Twin Peaks was changed to mandatory evacuation.

7:00 AM Sunday: The Governor declared San Bernardino County a state of emergency. The fire jumped the 330. The fire department started setting backfires from Crest Forest Drive to the Rim. At this time the winds were blowing the fire away from the mountain communities.

9:40 AM Sunday: Over 12,000 acres have burned. The Old Fire is only 5% contained. The 215 and the 15 are closed. The Cajon Pass is closed. Traffic on the 15 was diverted at Hesperia. Highway 138 was open for evacuation. Evacuees were directed to Sultana High School in Hesperia.

9:00 PM Sunday: The winds died down. The fire has claimed 3 to 4 structures in Crestline. As of this time the fire had not reached Lake

Arrowhead or Running Springs. As of 5:00 PM it had burned more than 15,000 acres. Mountain area residents were urged to conserve water.

5:00 AM Monday: The Old Fire is still threatening Crestline, but had not progressed during the night. The Fire has jumped Highway 18 below the Cliff Hanger Restaurant. Interstate 15 and 215 were closed to traffic going north. Highway 38 was closed at Bryant in Mentone except to local traffic.

A wind advisory was put in effect until 2:00 PM when the high-pressure system over Southern California was expected to begin to break down. This should allow offshore humidity to flow in to the area.

10:00 AM Monday: The fire had burned up to the Cliffhanger Restaurant. A flank of it was burning in Lake Gregory, but was not affecting homes. The majority of homes in Crestline were not damaged. The fire in Devil's Canyon was blowing away from Crestline.

As soon as the winds became steady the fire crews began a burn out operation, setting backfires in the area along the Rim below the Cliffhanger Restaurant.

11:00 AM Monday: The fire had spread as far north as the Community Park at the top of Devil's Canyon. However, it had not crossed Devil's Canyon.

The Arrowhead Villas Mutual Services issued a water conservation advisory for the mountain areas to not drink the water until further notice due to power outages caused by the fires.

12:30 PM Monday: The fire crossed City Creek Truck Trail and was east of Mud Flats. A mandatory evacuation of Running Springs, Arrowhead and Green Valley Lake was issued.

3:30 PM Monday: The fire was being held at the ridgeline in Crest Forest. However it was slowly backing into the Lake Gregory area. Firefighters began setting a backfire to hold the fire below the 18.

6:30 PM Monday: Backfires were lit in the Rim of the World area. Firefighters were trying to prevent the fire from crossing the 18 and heading towards homes. The winds changed directions and were working against the firefighters. Fires returned between Rim Forest and Cliffhanger. The fire is now burning one-half mile below Running Springs all the way West to Sawpit Canyon.

5:00 AM Tuesday: The fire jumped the 18 and affected 35 structures in the Lake Arrowhead and Rim Forest area. Fire trucks lined up around the high school to make a stand to save the school. Some homes were destroyed in the Strawberry Peak area.

The fire was affected by increased offshore winds. Resources were made available from the Highland area and were diverted to the mountain communities.

6:30 AM Tuesday: Aerial photos show the fire right up to highway 18 at the Rim of the World High School.

7:30 AM Tuesday: The main flank of the fire was still below highway 18. The firefighters did an amazing job restraining the fire during the night. 7-10 homes were damaged in the Rim Forest area. Firefighters started a backfire operation. Additional strike crews were brought in from the Highland area to control the fire using backfires.

Aerial attacks were cancelled due to smoke and wind at the higher elevations. The wind began cooperating and blowing the fire away from the community.

8:00 AM Tuesday: Twin Peaks, Blue Jay and Lake Arrowhead remained untouched. Rim Forest lost 6 structures.

10:50 AM Tuesday: The fire was still holding at highway 18. Rim Forest lost 20 structures. Big Bear Valley, Angeles Oaks, Seven Oaks and Forest Falls were placed under mandatory evacuation.

1:30 PM Tuesday: Air support has been very helpful and the fire line holding.

3:00 PM Tuesday: Unconfirmed reports advise the fire is threatening Santa's Village and the Wiley Park area.

4:30 PM Tuesday: The fire has lain down and the winds are very calm. Smoke was moving into the Lake Arrowhead area. Aircrews continued to make drops with retardant in preparation for the night winds. The temperatures are expected to drop by another 8 degrees, which could be helpful.

4:00 PM Thursday: The Old Fire established itself in the Hook Creek area, Cedar Glen and continued to threaten the North Shore of Lake Arrowhead. Damage assessment was conducted during daylight hours. The decrease in

the wind assisted the firefighters overnight. Wind gusts were 50 miles per hour above 4,000 feet. Aggressive structure protection efforts were continued in all of the threatened communities.

The fire is near Green Valley. It is at Plunge Creek near Running Springs and it has affected homes in Twin Peaks near Crestline.

1:30 PM Friday: Good news the fire in Running Springs is close to being under control, and the CEDU School is still intact. Blue Jay is safe including Jensons and the Ice Castle, and so is Arrowbear, Green Valley, the North Shore of Lake Arrowhead and the Golf Course area. One house on Highway 189 burned in the Twin Peaks area and, the rest of Twin Peaks is fine.

1:30 PM Saturday: Evacuations remained in place. No passes were being issued (no exceptions). The remained fire is active in Crab Flats. The mountain area received an inch of snow during the night. Due to mudslides on the 18 and 38, and downed power lines the area continued to be dangerous.

1:00 PM Sunday: Twin Peaks, Blue Jay, Rim Forest, Sky Forest, Lake Arrowhead, Cedar Glen, Running Springs, Arrowbear and Green Valley are still under mandatory evacuation. However, people in Valley of Enchantment, Cedar Pines Parks, and Crest Forest west of the 138, west of Old Mill Road and Lake Drive south of Knapp's Cutoff can obtain a pass from the evacuation centers and return to the mountains. However, there were no utilities. As of 1:00 P.M. on Sunday the active fire areas were:

- One mile south of Running Springs
- Three miles north of Lake Arrowhead (at the sewer disposal pond).
- East of Lake Arrowhead in the Crab Flats area (seven miles from Big Bear).

2:00 PM Sunday: Mandatory evacuation for residents was changed to voluntary in Lake Gregory and Parts of Crestline, West of 189 at North Road extending along Highway 189 to Highway 18 at Lake Gregory Drive.

AFTER ACTION REVIEW WORKSHOP

On April 7th and 8th, 2004 the San Bernardino County Fire Chiefs conducted an After Action Review Workshop to review and identify both successes and challenges of the "Old Fire" of October 2003. These "Lessons Learned" can be used as a learning tool to improve fire suppression operations and be used to improve training curriculums. The issues and trends identified were either resolved during the Workshop or were assigned by the County Fire Chiefs to the appropriate Mountain Area Safety Task Force (M.A.S.T.) I.C. for further analysis and resolution.

The goals of the Workshop were to:

1. Provide a format for collecting candid information from field personnel about the wildland urban interface tactics and strategies used on the "Old Fire"
2. Provide a debriefing process to examine both technical and human performance successes and failures.
3. Identify and document lessons learned and best practices.

The "Lessons Learned" included:

COMMUNICATIONS

PROBLEM:

Differences in radio frequency "800, UHF, VHF"

The San Bernardino County Fire Chiefs (SBCFC) in attendance identified the need to provide the ability to talk to other units at scene, including mutual aid resources. Some local government Division/Group Supervisors had limited radio contact with their department's I.C. at the command post, resulting in their communications going to their department's EOC.

What can be done to improve? Local and Statewide!

SOLUTION:

The SBCFC agreed to place this issue on the agenda for the annual pre-season meeting. In addition, the SBCFC agreed that is the responsibility of the Incident Commander (IC) to establish proper communications on all incidents. This issue must be addressed at the onset of the incident.

PROBLEM:

Tactical changes not in the Incident Action Plan (IAP) and/or approved by the Incident Commander. Is this "independent action" or "freelancing"?
i.e.: Commandeering incoming resources, conducting unauthorized firing operations, conducting branch planning not within established system.

What improvements in the system can be made, to reduce independent actions?

SOLUTION:

Establish clear lines of communication, and conduct and attend Operational Level Planning meetings as well as Branch Level Planning meetings.

PROBLEM:

Need to identify local agencies role in the Unified Command structure to ensure agency input in the development of Incident Action Plans and coordination of support resources. The lack of input results in agencies concerns being left out of the operations plan, causing delays in receiving up-to-date IAP and briefing updates, as well as a reduction and delay in logistical support to mountain. (Mountain fire agencies provided their own logistical support).

SOLUTION:

Identify an Agency Rep or Deputy Incident Commander as the primary contact with the Unified Command. Develop a communication system which allows for immediate contact for agency input into the IAP, if unable to participate in Planning Meetings. When long distances or travel times exist between the ICP and forward operating areas, the IC should make every effort to establish forward logistical bases to support the efforts of local government.

PROBLEM:

Need to identify the roles and responsibilities of the Incident Commander versus the Emergency Operations Center. Lines of authority and responsibility not clear to fire service line officers or EOC staff.

SOLUTION:

Develop training program to clearly identify roles and responsibilities of incident command staff, EOC staff, agency administrators (line officers), and their inter-action.

PROBLEM:

Lack of adequate radio equipment available for callback personnel adversely affected performance of their assignment.

SOLUTION:

Determine if adequate radio caches exist, and process for distribution as well as training to properly operate the equipment.

MOUNTAIN AREA SAFETY TASKFORCE (MAST)

PROBLEM:

The MAST program was identified as a direct contributor to the success in the mountain communities; however, valley and desert communities were not included in the original pre-planning process. Fires that originated in the valley or desert could have an immediate impact on the mountain communities.

SOLUTION:

Expand MAST to include the Valley & Desert Communities.

Refer this to the MAST OPS I.C.

PROBLEM:

There is a need to develop a Joint Information Center to ensure uniform information is distributed by all agencies.

SOLUTION:

Agencies need to agree to participation.

Refer this to the MAST Public Information Group.

PROBLEM:

The SBCFC agreed there is a need to advise the public that their compliance with the evacuation orders contributed to the success of the evacuation process without any injuries; and provided for the safe ingress of fire apparatus.

SOLUTION:

Encourage continued cooperation between fire and law enforcement in evacuation planning. Refer this to the MAST Public Information Group.

PROBLEM:

Recognize the success of the tree removal program by the property owners, Local, State and Federal Government.

SOLUTION:

Encourage continued cooperation between all parties including obtaining funding to complete the task. Advise the public and firefighters that the dead trees did not burn as intense as the live trees.

PROBLEM:

The SBCFC agreed on the need to continue to update the Structure Protection Plan and maintain proper distribution.

SOLUTION:

Continue the program until hazard is mitigated.

PROBLEM:

The SBCFC agreed on need to publicly recognize the positive effectiveness of the Fire Safe Councils and their direct contributions to community support and safety.

SOLUTION:

Continue the close partnership between the Fire Safe Councils and the Fire Service.

STRUCTURE PROTECTION TACTICS AND STRATEGY IN THE I-ZONE

PROBLEM:

The SBCFC agreed that the current standard practice of structure protection in the I-Zone is: "Bump & Run". However, during the "Old Fire" the tactics of "Anchor & Hold" and "End-Around" were used successfully. The SBCFC also agreed that "Anchor & Hold" should only be used when the water supply is sufficient to support this type of operation.

SOLUTION:

The SBCFC referred this to the County Fire Chief's MAST Training Officers for research and development. If adopted; the tactic should be submitted to the State Training Committee.

THE FEDERAL WORK-REST CYCLE

PROBLEM:

The current Federal Work-Rest Cycle requires the Federal Incident Commander to enforce a 2 to 1 Work- Rest Cycle. Local and State Incident Commanders are not held to this standard, and due to operational needs; do not comply with the Federal Work-Rest Cycle during the initial attack; therefore there is a conflict during Unified Command.

SOLUTION:

The SBCFC agreed this item should be referred to the MAST OPS I.C. to determine if a letter should be sent to the Federal Fire Agencies to address this issue. Issues that might be considered in the letter include

- Requirements vs. Guidelines
- What is a Reasonable Shift Link
- Exempting the first 72 hours of Initial Attack
- Providing Errors and Omissions Insurance for all Incident Commanders

APPENDIX - A

WHERE DID ALL THE INCIDENT COMMANDERS GO?¹

An Opinion

Jeff Blackwood, Forest Supervisor

Umatilla National Forest

02/04

I have a deep concern for the Agency. My intent in writing this was to expand the discussion with the idea of having a fuller and richer communication of issues, to bring people together and decrease divisiveness.

If we are not thoughtful in our responses to incidents where things go badly, one day soon we will look around and ask ourselves, "Where have all the ICs gone?"

As an agency, we respond to things that go wrong by reviews, analysis, and developing more processes and requirements while prescribing accountability and penalties. We anticipate that it will make things better. This may be helpful and necessary, but it is not the full answer if we are truly committed to a sustainable approach to dealing with wildland fire safety. These typical responses deal with the process and legal ends of things, but what of the human end?

When I meet with our ICs at the field level, I see more and more frustration, and outright fear. They ask why should they be an IC? Where is the agency support? What will happen to them and their families if anything bad happens? Who can they trust? Are they being set up by mandatory training and processes, so if something goes wrong, the agency can say that the Forest Service did our part – the IC or the line officer just did not do hers/his? They understand accountability – they are concerned and fearful of agency reactions and support. Even though the track record does not necessarily bear these fears out, believe me, they are there. You can see it in their eyes and feel it in their questions. The simple fact is that the playing field has changed, and we need them more than they need us.

These are real life responses to serious concerns. We as an agency tend to focus on providing the framework within which people should operate. We train and train, but is there more?

¹ Provided with Permission of Jeff Blackwood

I suggest there is. I suggest there are several things we need to do to provide incentives and support to the ICs for them to be successful. It is only when they succeed that our agency is successful. Consider:

- We invest heavily in technical training. We invest little in the art of decision-making. The kinds of decisions ICs make are not normal bureaucratic decisions. They are literally under fire. How well do we understand this, and provide the support, training and trust that recognizes the uniqueness, complexities, and difficulties of these situations?
- We have top down reviews of programs. We need reviews from practitioners. Do we ask local ICs to critique processes and requirements we set on their shoulders? Do we ask them what is needed for a safe and effective program? Do we actually use that feedback? Maybe locally, but not much further.
- When was the last time that we saw a national letter of support for the ICs, recognizing the difficult and important job they do? It is more common to just give them a letter with a long list of agency expectations.
- Have we considered incentives for ICs? Have we asked them what would be useful to them? Many Type 3 and larger ICs are not in primary fire positions. It would be easy for them to say the press of business elsewhere is more important.
- Could we more effectively single out ICs for tailored leadership training in a way that develops their skills, and doesn't just leave them with a list of expectations?
- Put yourself in the shoes of an IC. You are responding to an incident and are responsible for the life and safety of everyone involved, plus a host of other things. This is an awesome responsibility. How many of us have done this lately? Are there ways to help the ICs with this pressure? I assure you that another form to fill out or another certification program won't do this.
- Many of our fires are multi-jurisdictional. Some of the other jurisdictions do not necessarily endorse or support our process requirements. The IC has to make that work in real time, under heavy pressure, with real lives at stake. How many of us have to do this?
- How many of you are line officers are ultimately responsible for everything that occurs on a Forest? If things are not 100%, there are many who know how to "make it better". And, by the way, make sure all your targets are met.

I am not suggesting we change our standards or accountability. There are good and legally based reasons for them. What I am suggesting is there is a human element here – a need to invest in the arts and sciences of building

decisional capability, of creating trust, and developing incentives for people to want to be ICs. It would be easy to say that this is the kind of leadership we should practice locally, and we do. What I see as missing is the national link to these principles. How often we forget that our agency is only as good as the people we employ.

To employ good people, we need to be a good outfit that not only provides a safe and supportive work environment, but also the trust that is the basis for any relationship.

As we continue with the aftermath of South Canyon, Thirty-Mile, and now Cramer, we need to deal with the human side as well as the process side. There needs to be good reasons, based on trust, that make the job of an IC worth the risks that grow everyday. On this Forest, we average 130 wildland fires a year. There are 130 times that things can go wrong. We depend on the ICs to make them go right. Their motivation and character keep us in the game. I write these words not to be critical, but to stimulate a more rounded approach in positioning us all in reducing the incidents where bad things happen. My heart is with the Forest Service, and with the wonderful people who make it work.

I do not want to be a line officer watching a fire going over the hill, wondering - where have all the ICs gone.

Jeff Blackwood, Supervisor
Umatilla National Forest
2517 S.W. Hailey Ave.
Pendleton, Oregon 97801
(541) 278-3716

APPENDIX - B

DEVELOPING COMPETENT INCIDENT COMMAND OFFICERS

An Opinion

William F. Maxfield, Fire Chief - Retired

Developing Competent Incident Commanders in metropolitan and small city fire agencies is a greater challenge to the Fire Service today than it was several years ago. Gaining experience through "on-the-job-training" for functional General Staff and Command Staff positions of an Incident Command Team is no longer a feasible training method.

In the last 25 years, modern effective fire prevention programs have resulted in a significant reduction in major fires in urban and suburban areas, with the exception of I-Zone fires across the United States. Normally, 25 to 30 years covers the career of most current incident commanders.

Multi-tasking of the modern fire service has divided time that was once spent specifically on firefighting, strategy and tactics to be shared with responsibilities for EMS, Haz-Mat, Tech Rescue Teams; and now Terrorism. All of these disciplines have placed a high demand on the Command Officers time over the past 15 years.

It is common for the experienced "senior" command officers to manage the relatively few major incidents that organizations may have. The results are a generation of fire service professionals with a limited experience base in managing major incidents. This will be exacerbated in the near future with the mass exodus of experienced command officers due to retirements.

Current training methods do not provide sufficient evidence that they properly assess the capabilities of fire officers in managing the command and control roles for which they have been assigned responsibility.

Incident Commanders are no longer viewed as someone who voluntarily renders aid to another in distress although under no duty to do so, but as paid professionals expected to be properly trained to utilize sound judgment during critical incident management.

After-action review reports demonstrate the need for IC system training improvements; teaching ICS as an all inclusive critical management process, not just selecting parts of the Incident Command System to be learned and applied.

Fire simulators, live fire training, table top exercises, sand boxes and chalk boards or using a task book does not provide an adequate level of stress to measure an incident commander and his team's ability to perform in a high stress situational environment.

Another means of training must be developed to create this environment of stressful reality, recreating an event the magnitude of an actual situation.

It has been recognized that a student's ability to perform the skills learned under low stress conditions deteriorates when the level of stress is raised. Knowing the individual will face real responsibility for his or her actions is an important factor that influences the way an individual will respond. Observable symptoms of a person faced with a high level of stress will often be that he is slow to react, displays an ability to deal with only one issue of the incident at a time, shows signs of unhealthy tension, and freezes in thought and action.

Statistics show that many, who have demonstrated adequate standards of performance under simulated conditions, develop stress symptoms when conducting live training. Allowing those who are vulnerable to stress to be responsible to perform during a potentially lethal operation introduces an unacceptable risk to the safety of personnel and equipment.

There is, therefore, a need to develop responsibility/stress training to provide personnel to operate these systems and manage these teams safely, and to demonstrate their ability to do so before taking up the role of incident commander at a major disaster. The disaster itself is not the time to train.

Although this training will have a significant cost, the cost of not training is much more expensive.

####

APPENDIX – C

RECOMMENDATIONS WILDLAND FIRE TRAINING CURRICULUM FROM AFTER INCIDENT REPORTS

COMPILED BY THE
WILDLAND FIRE LESSONS LEARNED CENTER
SEPTEMBER 2002

As of September 12, 2002 the Lessons Learned Center has received approximately 55 Lessons Learned After Incident Reports (AIR) from Type 1-5 incidents this season. One of the questions in the report asks "What changes, additions or deletions are recommended to wildland fire training curriculum?" Approximately 35 of the reports made recommendations. The input is explained below:

ALL TRAINING

All wildland fire training needs to emphasize the importance of:

- a. Knowing the ICS system
- b. Knowing LCES (Lookouts, Communications, Escape Routes & Safety Zones)
- c. Knowing your equipment and its capabilities, (i.e. radios, GPS receivers, vehicles, saws, chemicals, etc.)
- d. Understanding that EVERYONE is a SAFETY OFFICER and must act like one

Training Strategy – A concentrated effort is needed to expand the depth of qualified personnel to fill the entire range of ICS positions, in all sections. Courses need to be offered to expand this depth.

Fire Rehabilitation – It is critical that courses reference the rehabilitation of fire suppression activities. Many times the damage caused by fire suppressions activities is far worse than the damage caused by the actual fire. Emphasize the following:

- Crews and overhead need to start planning for rehabilitation during suppression to make rehabilitation easier
- Crews and overhead need to pack out their garbage at the end of shift and use Minimum Impact Suppression Techniques (MIST) techniques
- Importance of doing a high quality job of resource protection during fire suppression

COMMAND AND GENERAL STAFF

IMT instruction must emphasize:

- a. Especially at the beginning of an incident, the IMT must be innovative, adaptable and flexible to adjust quickly to extreme conditions as those conditions present themselves.
- b. A more complete overview of the full range of appropriate incident management, the role of long term implementation planning, and how objectives other than full protection can be successfully accomplished.
- c. The importance of disseminating information from the IC and Section Chiefs to the IOFR. A more effective system needs to be developed.
- d. Applicability of GPS and GIS at all levels.

Extended Attack Incident Commander Course ICT3 (S-300):

- a. Evacuation and contingency planning needs to be emphasized in this course and then exercised at Command and General Staff Course S-420. Important to stress that local resources should prepare this planning document and then handoff during transition.
- b. Instructors should teach the risk analysis process from the Incident Response Pocket Guide (IRPG).

Incident Commander Course ICT2 (S-400):

- a. Add more information emphasizing the significant role of the Liaison Officer LOFR.

Command and General Staff (S-420):

- a. Make more slots or sessions available. Numerous SOFR's, PSC2's, OSC2's and IOFR's are ready and able to take over a section but are not allowed to do so because they have been unable to take S-420. Schedule sessions on different dates than Section Chief training.

PLANNING SECTION

Situation Unit Leader SITL (S-346) and Field Observer FOBS (S-244):

- a. The productive use of GPS is increasing exponentially. It provides more accurate mapping tools when used correctly. It creates significantly useful information for the decision-making needs of the IC and the IC support staff. It needs to be incorporated into these courses.
- b. FOBS need specific GPS skill instruction with field exercises in Field Observer Course S-244. The FOBS must have these skills to operate effectively and productively on an incident.

Situation Unit Leader SITL (S-346):

- a. Situation Unit Leader Course S-346 instructors need to be aware and orient students to new technology being developed by Riverside Fire Lab. The system

is called FIRE MAPPER (Thermal Imaging Radiometer.) This remote sensor platform is in a USFS owned aircraft and is available on request through Northern and Southern Operations in California. Data is posted to Web and can be pulled down. It does not require an interpreter.

- b. Instructors should orient students to Palm Infrared and GIS Mapping. Palm IR allows for detection of "near impossible to visually detect" heat sources.

Resource Unit Leader RESL (S-348), Demob Unit Leader DMOB (S-347) and Status/Check-in Recorder SCKN (S-248):

- a. Instruction needs to emphasize the 14-day limits and work/rest policy and how this is important to track from check-in through demob. The revised ICS 211 Check-in List needs to include the 14-day and work/rest ratio information.
- b. Resource tracking through T Cards has become nearly obsolete through the implementation of ISuite software and the ability to modify and print (with a plotter) wall-size visuals and charts. ISuite needs to be incorporated into the planning section curriculum.

Technical Specialist THSP (GIS):

- a. GIS technical specialists should be required to attend Firefighter Training Course S-130 and Introduction to Wildland Fire Behavior Course S-190 to learn basic wildland fire behavior.

Computer Technical Specialist CTSP:

- a. CTSP course should have subject matter topic on IRSS relationships with Incident Tracking Systems (ITS) and ICARS.

OPERATIONS SECTION

All Operations Courses:

- a. Should stress the risk analysis process as outlined in the Incident Response Pocket Guide (IRPG). More training exercises are recommended for SITL, DIVS, and OPS.
- b. Improve the quality of meteorology training in intermediate and advanced Operations courses, not just in Fire Behavior Analyst FBAN courses.

Annual Fireline Safety Refresher:

- a. Instructors should remind firefighters and crews that fire whirls can travel into the black carrying significant heat and embers. They should be physically and mentally prepared for this to happen.

Division/Group Supervisor DIVS (S-339), Task Force/Strike Team Leader STLC (S-330), and Crew Boss CRWB (S-230):

- a. Instruct trainees on how to better work with and effectively utilize inmate crews and military crews, particularly inmate crews.

- b. Emphasize the importance of NOT RUSHING to put firefighters on the line in difficult terrain without thorough LCES planning.

Basic Firefighter FFT2 (S-130/190) and Crew Boss CRWB (S-230):

- a. Contract crews need to complete this mandatory training and receive certification the same way that agency crews do.
- b. S-130/190 needs to include basic "woodsmanship" for the military.

Helicopter Crew Member HECM and Type 1 Handcrew:

- a. Develop a course for specialized resources on the IMT function and process with emphasis on planning and decision-making processes, and logistical support considerations.

Wildfire Powersaws (S-212):

- a. Industry standards (or industry codes of practice) need to be adopted consistently on fires.

Fire Operations in the Urban Interface (S-215):

- a. Provide productive examples of how structural protection group leaders and DIVS can more effectively liaison, especially at daily operational briefings.

LOGISTICS SECTION

Ground Support Unit Leader GSUL (S355), Supply Unit Leader SUPL (S356),
Facilities Unit Leader FACL (S354) and Security Manager (SECM):

- a. Annual refresher courses are needed for these unit leader positions. They can be modeled after the Food Unit Leader FDUL annual refresher course and could be presented at the National Logistics Workshop.

Receiving and Distribution Manager RCDM (J-253):

- a. Current self-study on hazardous materials is inadequate. Requirements for handling, storage and/or disposal of these materials cannot be effectively taught via self-study courses. There must be a pertinent "hands-on" training course developed and implemented.

Logistics Section Chief LSC2 (S-450) and Facilities Unit Leader FACL (S-354):

- a. Curriculum and instructors need to emphasize the various needs, including electronic equipment, to be considered when selecting a site for an ICP.

Ordering Manager ORDM (J-252) and Supply Unit Leader SUPL (S-356):

- a. Instructors should orient students to the Multi Incident Resource Process System (MIRPS) that is used statewide in California. Students should also be given updates on the progress on the Resource Order Status System (ROSS) that is currently being tested. ROSS will be used nationally.

FINANCE SECTION

Interagency Incident Business Management (S-260):

- a. Important to train the incident business management people and federal fire administration that incident business should be structured to support strategy development and the implementation of tactics. Strategy and tactics are controlled by the incident business policy and procedures.

Personnel Time recorder PTRC and Equipment Time Recorder EQTR:

- a. Instructor should expose students to Incident Tracking Systems (ITS).

APPENDIX – D

COMMAND DURING CATASTROPHIC INTERFACE WILDFIRES²

**By: Michael S. Rohde
Battalion Chief
Orange County, CA. Fire Authority**

A recently completed study provides insight into critical decisions by command officers at some of California's most notorious wildland interface fires. Command complexities that were commonly experienced and key decisions that were made during initial command of the Old Topanga, Kinneloa, Laguna (Orange County), Paint, Tunnel/Berkeley Hills, and Harmony Fires were identified. Collectively, these six fires caused 30 fatalities, burned 4,907 structures and 52,422 acres, and occurred in or immediately adjacent to heavily urbanized areas during the 1990's. The vast majority of loss occurred during the first 12 hours in each of the fires. The study focused on the first several hours of response to the fires, a period of time when organizational development and control can be as complex as the fire itself, and state or federal incident management teams have not yet been mobilized. The Laguna Fire received additional study to fully document command and general staff experiences representative of such fires. In addition to the specific fires, subject matter experts with exceptional interface wildfire command experience were consulted on their observations from these and other fires. These experts included: Bill Teie, Bill Clayton, Tim Sappok, John Hawkins, and Chuck Manor from the California Department of Forestry and Fire Protection (CDF), Gary Nelson from the Los Angeles County Fire Department, and Mike Warren from the Corona Fire Department, (formerly with the USDA Forest Service and CDF). The study identified a series of best command practices that might be used by incident commanders and others responsible for leadership for future catastrophic interface wildfire.

Characteristics of Catastrophic wildfire

Forty-seven factors were common among all six studied fires. These factors are suggested to be characteristic of catastrophic interface wildfire. All of the fires occurred during critical fire weather patterns, involving Santa Ana or other foehn winds. The fires generally occurred in steep mountainous terrain that had history of repetitive wind-driven wildfire and structural loss. Native chaparral fuels were abundant in the fire areas. All of the fires exhibited

² Provided with Permission of Michael Rohde, B/C

historically rapid rates of spread, and occurred during a seasonal drought period with critical live and dead fuel moistures. Enhancement of conflagration phenomena occurred immediately following mass structural involvement in each of the fires and included extreme burning intensity, fire whirls, long range heavy spotting, mass ignition, high energy release, and rapid rates of spread. Multiple major fires were occurring simultaneously in the surrounding region. Each of the fires began as a wildland fire and transitioned into structures. The fires occurred following a wet winter, preceded by multiple years of drought.

Community Planning and Development

Involved communities were largely constructed of non-fire resistive construction including wood shake roofs. Many structures lacked adequate fuel modification or brush clearance and some had concentrations of combustible landscaping adjacent to structures. Water systems were often unable to provide adequate fire flow or failed during the fires. Communities at risk had generally limited arterial road access and egress. Many isolated structures burned in each fire that were served by substandard or hazardous road or bridge access. Dense structural spacing aided conflagration development at some locations. Each fire occurred adjacent to large population concentrations. The presence of threatened or endangered species was an obstacle to pre-suppression activities in each location before the fires.

Emergency Response

Each fire caused significant injury and half caused loss of life. Available regional fire resources were overwhelmed by the initial fire problem and massive structural loss occurred during each incident's first 12 hours. Firefighters practiced structural triage to select defensible homes, and a period of independent action by firefighting resources occurred at each of the fires. Regional commitments to multiple fires compromised availability of aircraft, hand-crews, and dozers. Communications centers and fire radio systems were significantly overwhelmed.

Situation driven tactics compromised and elevated firefighter risk, as did the need to effect rescues and civilian evacuations. The need for evacuations compromised the ability for resources to concentrate on firefighting operations. Coordination with police agencies for traffic control and evacuation was problematic at the studied fires, as was acquiring accurate situation and resource status. Inability to provide adequate and timely logistical support including water and fuel compromised firefighting. Loss of momentum occurred in perimeter control activities as a result of concurrent structural protection demands. Effective command organizational development was hindered by lack of availability of qualified staff and the rapidly changing fire conditions. Initial command post locations were generally inadequate, with command posts burned over in three of the six

studied fires. Incident managers experienced difficulty in maintaining mobility of initially deployed resources to address new and evolving threats. Mobilization of mutual aid resources was slow and problematic despite the advanced development of the State of California Fire and Rescue Mutual Aid System. These problems were exacerbated by over-ordering of resources at some incidents. Initial use of multiple resource ordering points complicated initial organizational and command activities. Limited communications and interaction between fires and governmental emergency operations centers contributed to confusion and support inadequacies. Significant residual structure loss occurred in subdivisions partially stuck by fire and left within the fire's perimeter due to lack of resource availability. Evacuation of equestrians and other animals was problematic. The incidents experienced a high demand for public information and received variable quality in media public messaging.

Human Factors

Firefighters and fire officers acknowledged stress in each of the incidents associated with high risk-high consequence decision making, and as a result of their knowledge of increased operational risk, firefighter entrapments, and loss of life. Many in command organizations sensed frustration at the significant structural loss which occurred. Public fear and panic was present at each of the incidents and directly impacted firefighters. Search and accountability for missing persons, reports of trapped individuals and concern for civilian defense of personal property proved problematic. Public volunteerism and desire to assist was unmanageable for each incident concurrent with firefighting operations. Firefighters used recognition-primed decisions, for better or worse, in exercising tactics and strategy. This emphasizes the need for high quality training and experience. Demands for fire service involvement in post fire recovery and political activities exceeded all expectations of fire service agencies at each of the incidents.

Independent Action

Particularly problematic to the early periods of firefighting was the use or need for independent action by on-scene firefighting resources at each of the studied fires. Independent action occurred either through an intentional delegation by command, or through unselected organizational evolution. Clearly, this condition was driven by the early presence of overwhelming and dangerous fire conditions. The evolution of this strategy was often tied to the inability of an incipient command organization to enforce an alternate strategy upon an incident. The ability to achieve tactical benefit through independent action was driven by the training and motivation of individual crews, and is not without examples of great success. The essence of this strategy is best stated by Chief Tim Sappok, "with independent action, you get a lot of productivity, its just that as Incident Commander you may not know, or be able to direct, what that productivity is". Independent action

was so prevalent among the studied fires and among other similar fires that the author felt it was characteristic of the evolution of a major interface fire. Independent action however carries its own set of significant issues and concerns. Interestingly, all study respondents viewed this as a "strategy of last resort". Independent action was attributed to compromises in safety and efficiency and loss of organizational control and resource accountability at all of the studied incidents. During several of the studied fires, high risk-low success probability firing operations were conducted during independent action. While some of these firing operations were successful, others directly contributed to structural loss. Firefighter entrapments were common to this period, with the Old Topanga incident experiencing over 20 separate entrapment situations during independent action. Command organizations reported difficulty in mobilizing effective deployments to new threats and in accomplishing coordinated search and evacuations. Interestingly, when the Laguna and Paint Fires selected to implement independent action strategies, the incident organizations seemed to revert to an "initial attack" from a major fire orientation. Re-institution of firmer organizational controls later in these fires was difficult.

In general, the command approach to independent action is to "make it go away" as quickly as possible by consolidating command and developing field supervisory positions. This practice however takes time and resources. Experts have identified a series of specific recommendations to mitigate some of the negative aspects of this strategy. However, the prevalence of the use of independent action, whether desired or not, emphasizes the need for specific training for such operations.

Best Practices

Command organizations at the studied fires and consulted experts identified a number of successful methods and systems that serve to reduce firefighter risk, and increase organizational efficiency and accountability during catastrophic interface wildfires. They are best utilized in a "systems fashion" which integrates multiple concepts into a command methodology.

Pre-fire Planning

Pre-planning for interface wildfire risks and in historical fire corridors was described as being critically important by experts. According to Chief Bill Clayton, "its better to expend mental energy before the fire than during the event", to conceive strategies and tactics, identify values at risk, plan deployments and evacuations, calculate resource needs, and project fire behavior and spread. Every consulted expert had developed plans for their respective areas of responsibility and many had involved cooperating agencies including law enforcement. Some had followed up on planning with inter-agency tabletop exercises.

Branches vs. Divisions

The majority of the experts consulted use a specific approach within the Incident Command System (ICS) for major interface fires. When these experts identify the likely development of a major fire, they will organize the incident by Branches rather than Divisions first. Branches are established for each flank of the fire and possibly for structural protection, law enforcement/evacuation, or other specific needs. Operations Branch Directors are delegated responsibility to establish Divisions or Groups within their Branches as resource availability or situational needs dictate. This has several benefits. By establishing Branches first, the entire projected fire area can be organized initially and no area of the fire is left unsupervised. This practice allows an Incident Commander (IC) to place initially responding command officers immediately into high responsibility positions, allowing for best use of their local experience and knowledge.

These are also likely people with whom the IC has considerable relationship and pre-established trust, which was observed to be a key element in the studied fire organizations. This establishment of Branches mitigates many independent action concerns through provision of at least a basic or incipient command framework. Several of the studied fires allowed highly qualified chief officers to function at the strike team leader level during early command development. This contributed to an inability to later staff Division Supervisor or Branch Director Positions needed as the fire grew. This also contributed to later organizational problems such as underestimated or unnoticed fire growth, inadequately addressed tactical and safety issues, and lack of focus on multi-dimensional needs such as concurrent perimeter control and structural protection demands. Experts recommend reassignment of qualified Strike Team Leaders to higher ICS positions whenever possible during early incident development. Use of inexperienced staff at the Division Supervisor level was also cited as problematic. Experts cited the 1996 Calabasas firefighter burnover incident in Malibu as an example. During that fire, a minimally experienced Division Supervisor provided poor guidance that contributed to the entrapment and injury of multiple firefighters. Experience at the Division Supervisor level is particularly important when large amounts of mutual aid resources are deployed. Since many mutual aid responders come from agencies without a primary wildland firefighting mission, safety and experience is an issue for these responders during deployment and requires greater supervision. IC's and others are encouraged to utilize job-person match criteria in assigning known talents of responding fire officers.

OSC-IC Relationship

The requirement for the Operations Section Chief (OSC) and the Incident Commander (IC) to communicate on a nearly constant basis during early incident development was critical during all of the studied fires. However, a

competing demand exists for the OSC to provide management and leadership of suppression and related activities. At the Laguna Fire in particular, the inability of the IC and OSC to communicate led to conflicting directions and dual assignments for a period of time during the peak structural siege. Their communications was complicated by a saturation of radio and cellular phone frequencies and the distant physical location of these individuals. In retrospect, these individuals indicated they would have liked to have physically collocated when communications systems failed to enable maintenance of this necessary relationship.

Some experts believed that the OSC should be physically collocated with the IC during catastrophic interface fire to best facilitate incident needs, while others believed the OSC needed to be delegated enough responsibility to work independently of the IC to achieve stated objectives. One expert went so far to say that the IC needed to understand the OSC's work environment and exercise patience, allowing time for results rather than expecting constant feedback. At the Old Topanga Fire, the IC and OSC were collocated but some experts believed this was a deterrent to effective operational leadership. Experts did agree on the most reasonable solution to this concern, recommending strong delegation from the OSC to Branch Directors for operations section management. With Branch Directors responsible for managing operations, the OSC can provide less direct oversight and achieve better partnership with the IC. Also, the OSC is freer to interact in other necessary relationships and attend planning and strategy meetings as needed. Such was the case for the Harmony Fire where the OSC managed five Branches. Branch Directors assumed responsibility for a great deal of the operational leadership and the OSC focused more exclusively on coordination and mobility of resources, and for ensuring that resources were responding to what was threatened by the fire as opposed to what is already on fire.

Strategy and Tactics

Experts focus on providing both offensive perimeter control and defensive structural protection activities simultaneously, and many view the abandonment of one activity over another as a critical command error. Abandonment of perimeter control complicates fires through unabated expansion, increasing structural risk, and difficulty of control. Experts suggest assignment of wildland firefighting resources such as crews, dozers, air tankers, and some engines to perimeter control with an expectation for these resources to conduct key control activities to limit the spread of the fire. Type 1 or 2 engines are ideally assigned for structure protection and are best supported with helicopters which have the ability to work in closer in heavier smoke conditions. Some experts viewed this allocation as somewhat situational, but emphasized that if perimeter control is abandoned for a period of time, then it must be reestablished as soon as possible. A common

strategy for wildland interface fires is to "pinch the flanks" as hard as possible through perimeter control to limit the width of the fire's head as it enters structures. Perimeter control should take advantage of natural breaks, non-combustible developed areas, agriculture, old burns and the like as much as practical.

Experts suggested that IC's focus on the "big decisions" of life safety, opportunities for containment, and property protection. This was acknowledged as difficult considering the blitz of information received by the Incident Commander. Vigilance was recommended to ascertain these issues from the minutia of information received. Support of effective operations with additional resources, taking advantage of containment opportunities, and holding line you have already created are important aspects of this vigilance. Experts recommend allocation of resources to structural areas that have been hit and experienced partial loss to prevent additional loss from residual fires after the main fire has passed.

Command Post Staff

To assist in command development, most experts assign firefighters from greater alarm resources to assist in initial situation and resource status tracking, incident communications, staging, and other initial logistics functions. These personnel assist the IC in executing timely support of incident objectives until they can be relieved by fully qualified ICS staff. Chief Gary Nelson suggested that command staff development must match resource commitment or risk becoming hopelessly behind. Nelson would direct responding resources to report to one of at least two staging areas on opposite sides of the fire for assignment. He communicates potential assignments directly to the staging area manager who fills the requests through face-to-face contact with available resources and reports the action to the IC. In this manner, the IC ensures check-in of resources and reduces radio traffic. Lack of timely delivery of logistical support in the studied incidents led to lack of firefighting or drinking water, food, vehicle fuel, or delivery of needed resources to meet firefighting demands. Lack of quality resource or situation status confounded later operational period planning and resource ordering for lack of knowledge as to the extent of resource commitments or the true extent of the fire.

Ordering of Resources

Two of the studied fires drew the largest response of the State's mutual aid system to date, with one drawing over 900 engine companies. This size of deployment presents many obstacles to effective use. Of the 900 engines assigned to the Old Topanga Fire, only 20% of these resources were actually committed to an assignment. Chief Bill Teie commented that the California mutual aid system has the ability to deploy beyond the ability of human management, a finding that was emphasized by a Rand Corporation study of the Old Topanga Fire where fire apparatus formed a miles long traffic jam on

Pacific Coast Highway. Experts agreed that over-ordering has become a serious problem in California wildfires and that better resource utilization must be sought. Most experts could not visualize a California fire problem requiring in excess of 300 engines. Pre-fire planning was suggested as key to calculation of effective resource ordering and deployment needs.

In addition to the commitment of available local resources, the California mutual aid system delivered an average of 10 to 12 additional strike teams within a 2-3 hour period of request to each of the studied fires. Accordingly, experts have preplanned how they would best utilize this resource with an understanding that regardless of how many engines might be ordered; only a finite number will arrive over the next critical few hours. Chief Nelson created "blitz lists" that pre-identified resource orders to be placed when fires reached pre-planned benchmarks, relieving his conceptualization of such orders at the time of need. These benchmarks included fire projection maps with time ellipses at hourly intervals that assisted him in preplanning resource deployment and mobility. Past fire history can also guide resource needs assessment and planning.

Risk Acceptance and Mitigation

Operations involving elevated risk are allowed by experts only in situations meeting very specific criteria. Generally, such missions require a direct civilian life safety risk and must be executed with strong planning and support. Lesser risk involving structural protection values alone must be abated completely by the presence of safety zones or related factors, and life risk for strictly natural resource protection is generally not tolerated. Operational risk for other activities must be addressed on a continuing basis for all line assignments and mitigated as much as possible. Mitigations can include aircraft support, construction or identification of safety zones, communications and lookouts, varied tactical approaches, and related factors.

Many experts suggest that medical personnel not only be pre-positioned for firefighter support, but that additional resources for technical rescue and extraction be placed at their immediate disposal. In one case in Los Angeles County, a burnover involving two crew firefighter fatalities and two serious injuries required hours for personnel extraction due to difficult terrain. Experts delegate accident scenes as "incidents within incidents" as soon as possible, providing separate command, communications, and resources. Often, the Incident Safety Officer leads such efforts. Experts will segregate involved crews either back to productive fire line activities as soon as possible or remove those that may be exposed to critical incident stress or other injury.

Unified Command

Unified command was practiced to some extent on all of the studied fires, with various degrees of implementation and timing. The most successful incidents immediately organized a unified command and ordering point. These actions were important to reducing independent action and increasing command cohesiveness, and for concentrating available firefighting resources on the most significant needs. Incidents that included law enforcement in unified command were highly successful in mounting evacuations. Despite some complexities of this law-fire relationship at the Laguna Fire, 26,000 people were evacuated from the City of Laguna Beach and surrounding area in a matter of two hours. This evacuation included planning for fire service access and separate civilian egress. In contrast, lack of effective traffic management during the Tunnel Fire contributed directly to loss of life.

Media Relations

Studied incidents that utilized media to communicate evacuation and related fire messages were highly successful in critical message distribution. Those incidents that did not engage the media suffered dissemination of misinformation and mis-direction of civilians in the fire area. The assignment of an Information Officer to deal with media for such fires was considered essential by experts.

Catastrophic wildland interface fires are common to the California landscape and are becoming widespread across the nation. These six fires confounded the best cooperative efforts of local, state, and federal firefighters who shared responsibility for initial response. Command decisions and actions can and should be pre-planned for such events to provide for the best potential outcome, and to provide peak firefighter safety and efficiency. Decisions must be made and instituted quickly to meet the demands of these rapidly evolving incidents, often in the absence of organized management teams and with the best local capability possible. The author hopes these findings improve understanding of major interface fire characteristics and assist fire officers with recommended best practices to achieve superior leadership and command for wildland interface fire incidents.

Mike Rohde is a Battalion Chief with the Orange County, CA. Fire Authority. He holds a Masters Degree from California State University and NWCG-ICS leadership qualifications in command, operations, and planning. Chief Rohde recently led structure protection operations at both the Grand Prix and Old Fires during the 2003 Southern California fire siege.

APPENDIX – E

GOVERNOR'S OFFICE OF EMERGENCY SERVICES 2003 SOUTHERN CALIFORNIA FIRE SIEGE AFTER ACTION REPORT

PRELIMINARY EXECUTIVE SUMMARY

INTRODUCTION

This document provides preliminary information on the 2003 Southern California Fire Siege. In California, as part of the Standardized Emergency Management System (SEMS), statute requires the Governor's Office of Emergency Services (OES) to produce an After Action Report (AAR) within 120 days after each declared disaster. "This report shall review public safety response and disaster recovery activities." The supporting SEMS regulations require jurisdictions "declaring a local emergency for which the governor proclaims a state of emergency, and any state agency responding to that emergency shall complete and transmit an after action report to OES within ninety (90) days of the close of the incident period." Although the 2003 Southern California wildfires incident period officially closes on March 31, 2004, state agencies, local government and other stakeholders were requested to provide their AARs to OES by February 20, 2004. The purpose of this accelerated reporting requirement is two-fold: 1) To capture response efforts, lessons learned, and any recommendations before critical data is lost due to time, and 2) to ensure that information from the AAR process is accessible to the Blue Ribbon Fire Commission.

BACKGROUND

Beginning on October 21, 2003, southern California experienced the worst wildfire sieges in California's history. When the worst of the fires ended on November 5, 2003, there were 21 fatalities (one firefighter), 183 injuries, 3,616 structures destroyed and 746,008 acres blackened by 14 different fires in five counties. The response cost/damage estimate is over 2 billion dollars and required 15,631 personnel, including firefighters, law enforcement, administrative support and management staff, to assist with fire suppression efforts.

The catastrophic nature of these fires prompted Los Angeles, Riverside, San Diego, San Bernardino, Riverside and Ventura counties to declare local emergencies. Governor Davis declared a State of Emergency on October 26, 2003 for the counties of Los Angeles, San Bernardino, San Diego and Ventura and requested a Presidential Declaration. President Bush issued a Presidential Declaration of Major Disaster for four of the five affected counties on October 27, 2003. Riverside County was added to the list of federally declared disasters on October 30, 2003.

The California Fire and Rescue Mutual Aid System brought together more resources than had ever been used in its 54-year history. This system effectively coordinated the response of approximately 5,480 personnel that staffed 1,160 local government fire engines and 102 OES fire engines. California's neighboring states, Nevada, Arizona, and Oregon, also provided vital support to the siege by sending in 120 additional fire engines and the accompanying staff.

Combined local, state, and federal resources totaled 15,631 personnel from the fire services and 1,898 fire engines. It exceeded the previous wildfire record set by the Wildland Fires of 1993.

SCOPE OF THE REPORT

OES is continuing to prepare the comprehensive AAR on the 2003 Southern California Fire Siege. State agencies and operational areas (OAs) submitted their AARs using a Response Information Management System (RIMS) AAR form (original or modified versions). Over twenty state agencies were asked to complete this information. In addition, OES conducted fact-finding meetings with the impacted OAs during January 2004. OAs were given the option of using the fact-finding meeting (and supporting documentation) as their official AAR instead of completing the RIMS forms.

Preliminary Recommendations

The AAR process allowed OES to identify numerous recommendations for improving future responses to major incidents. Specific, itemized recommendations, which will subsequently become the basis for corrective actions, will be contained in detail in the comprehensive statewide AAR. Below are the preliminary findings and recommendations that fall into eight broad categories:

1. Standardized Emergency Management System (SEMS):

Most local governments and state agencies indicated that SEMS functioned well and helped them mount an effective response. Several agencies made specific recommendations to improve SEMS including: (1) capitalize upon existing SEMS strengths; (2) implement proposed modifications or refinements to SEMS based protocols and procedures; (3) modify Response Information Management System (RIMS) to make it more user friendly; (4) conduct SEMS training on a continuous basis to ensure all potential responders have the appropriate training; (5) encourage use of SEMS functions in the Disaster Field Office (DFO) environment.

2. Improving MA response and capabilities.

These areas include (1) more mutual aid training to assist with coordination issues; (2) establishing a statewide standard badging identification system to allow appropriate personnel access to restricted areas; (3) state agencies, i.e., CHP and Caltrans, should develop protocols regarding use of their local agency office personnel and equipment.

3. Communications:

Local government and state agencies need to have more interoperable communications in order to have a rapid and effective response. A number of local governments recommended that OES establish caches of communications equipment for easy access during disaster response. Local government and state agencies need to evaluate their communication requirements to ensure there is interoperability and redundancy.

4. Interstate Coordination:

Some states were unfamiliar with the provisions of the Interstate Civil Defense and Disaster Compact as it relates to response and reimbursement. Several agencies indicated there is a need to streamline the method of obtaining out-of-state resources to reduce the resource acquisition time frame.

5. Accessing Federal Military Assets:

Local government and state fire agencies indicated there is a need to streamline the method of obtaining federal military assets to reduce the resource acquisition time frame.

6. Federal-State Coordination:

Local government and state agencies indicated a need for a smoother transition from response to recovery. The consensus among respondents was that plans and procedures should be developed for the DFO in order to effectively integrate federal and state agency staff at the DFO and to minimize unnecessary organizational issues.

7. State Agency Plans and Procedures:

Several state agencies that had not been involved in previous disaster response activities identified a need to rework their plans and procedures to incorporate SEMS and mutual aid. Existing emergency plans in some agencies need to be revised to include the following issues: debris management, animal care during disasters, volunteer management, donations management, and medical/health/mental health integration.

8. Financial Issues:

Reimbursement issues need to be resolved for mutual aid deployments, volunteer organizations and other entities. All agencies identified a need for funding for training - regardless of the type of training. In addition, funding is needed for long-term environmental impacts due to the burned out and denuded landscapes. It is anticipated that the comprehensive statewide AAR will be available to public safety and emergency management organizations on or about May 1, 2004.

Information about its distribution will be found on the OES website at:
<http://www.oes.ca.gov/Operational/OESHome.nsf/1?OpenForm>.

Glossary of Terms

ANCHOR POINT – An advantageous location, usually a barrier to fire spread, from which to start constructing a fireline.

AREA COMMAND – An organization established to: 1) oversee the management of multiple incidents that are each being handled by an incident management team (IMT) organization; or 2) to oversee the management of a very large incident that has multiple IMTs assigned to it. Area command has the responsibility to set overall strategy and priorities, allocate critical resources based on priorities, ensure that incidents are properly managed, and that objectives are met and strategies followed.

AVERAGE BAD DAY – Fire conditions experienced during typical mid-fire-season day. Used as a benchmark to gauge fire situations.

BACKFIRE – A fire suppression tactic. Any intentionally set fire used to consume the fuel in the path of a free burning wildfire.

BIA – Bureau of Indian Affairs

BLM – Bureau of Land Management

CALMAC – California Multi-Agency Command. The information coordination center established in Sacramento. Tasked to gather timely information from regions, cooperating agencies, the media, the director, interested government leaders and the public.

CDF – California Department of Forestry and Fire Protection

CHIEF OFFICERS – Agency Administrators, Fire Chiefs and other strategic level staff overseeing Incident Commanders.

CONTAINMENT – A fire is contained when it is surrounded on all sides by some kind of boundary but is still burning and has the potential to jump a boundary line.

CONTROLLED – A fire is controlled when there is no further threat of it jumping a containment line. While crews continue to do mop-up work within the fire lines, the fire fight is over.

CONVECTION COLUMN - The rising column of gasses, smoke, fly ash, particulates and other debris produced by a fire.

COOPERATING AGENCY – An agency supplying assistance including but not limited to direct tactical or support functions or resources to the incident control effort.

CROWN FIRE – A fire that advances from top to top of trees or shrubs, more or less independently of the surface fire.

DEFENSIBLE SPACE - Creating a fire safe landscape for at least 30 feet around homes (and out to 100 feet or more in some areas), to reduce the chance of a wildfire spreading and burning through the structures. This is the basis for creating a "defensible space" - an area that will help protect your home and provide a safety zone for the firefighters who are battling the flames. It is required by California law.

DIRECT ATTACK - A method of fire suppression in which suppression activity takes place on or near the fire perimeter.

DIRECT PROTECTION AREA (DPA) - That area for which a particular fire protection organization has the primary responsibility for attacking an uncontrolled fire and for directing the suppression action.

DRAW DOWN LEVEL - The level where the success of extinguishing a fire with initial attack forces is compromised.

ESF4 - Emergency Support Function 4. A component of the National Response Plan developed for FEMA. A document that outlines different agency's responsibilities in different types of emergencies.

ESRI - Environmental Systems Research Institute. A software company that produces software that is widely used to produce Geographic Information Systems maps on emergencies for analysis and display.

EXTREME FIRE BEHAVIOR - "Extreme" implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following is usually involved: high rate of spread, prolific crowning and/ or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometime dangerously.

FEDERAL NATIONAL TEAM - A Type 1 National Incident Management Team coordinated by the National Wildfire Coordinating Group (NWCG). Team members may be from various agencies. The California Wildfire Coordinating Group (CWCG) sponsors five of the 16 national teams.

FEDERAL REGIONAL TEAM - A Type 2 Incident Management Team maintained by the U.S. Forest Service in the Pacific Southwest Region (Region 5, California and the Pacific Islands). Team members may be from various agencies.

FEDERAL RESPONSIBILITY AREA (FRA) - The primary financial responsibility for preventing and suppressing fires is that of the Federal Government. These lands are generally protected by the Department of Agriculture, Forest Service, the Department of Interior, Bureau of Land Management, National Parks Service, US Fish and Wildlife Service, and Bureau of Indian Affairs.

FIRE DANGER RATING – A management system that integrates the effects of selected fire danger factors into one or more qualitative or numerical indices of current protection needs.

FIRE LINE - A strip of area where the vegetation has been removed to deny the fire fuel, or a river, a freeway or some other barrier which is expected to stop the fire. Hose lines from fire engines may also contribute to a fire being surrounded and contained.

FIRE PERIMETER – The entire outer edge or boundary of a fire.

FIRESCOPE – Firefighting Resources of California Organized for Potential Emergencies. A multi-agency coordination system designed to improve the capabilities of California's wildland fire protection agencies. Its purpose is to provide more efficient resource allocation and utilization, particularly in multiple or large fire situations during critical burning conditions.

FMAG – Fire Management Assistance Grant. A federal assistance program managed by FEMA through the state Office of Emergency Services (OES). This program is designed to help state and/or local jurisdictions impacted by high cost, high damage wildland fires.

FUELS - Combustible material.

GACC – Geographical Area Coordination Center, see South Ops

GIS – Geographic Information System

INCIDENT COMMANDER – This ICS position is responsible for overall management of the incident and reports to the Agency Administrator for the agency having incident jurisdiction.

INCIDENT COMMAND SYSTEM (ICS) – A standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries.

INCIDENT COMMAND TEAM (ICT) – see Incident Management Team

INCIDENT MANAGEMENT TEAM (IMT) – The incident commander and appropriate general and command staff personnel assigned to an incident. Also known as an Incident Command Team.

INDIRECT ATTACK – A method of fire suppression in which suppression activities takes place some distances from the fire perimeter, and often advantage of fire barriers.

INFRARED (IR) – A heat detection system used for fire protection, mapping, and hotspot identification.

INITIAL ATTACK (IA) – An aggressive suppression action taken by first arriving resources consistent with firefighter and public safety and values to be protected.

INTERFACE ZONE – It is the area where the wildlands come together with the urban areas. Also referred to as the I-Zone.

INTERMIX ZONE – It is areas where homes are interspersed among the wildlands. Also referred to as the I-Zone.

JOINT INFORMATION CENTER (JIC) – An interagency information center responsible for researching, coordinating and disseminating information to the public and media. Formed through the MAST effort.

LRA – Local Responsibility Area

MACS – (Multi-Agency Coordination System) Is a combination of facilities, equipment, personnel, procedures, and communications integrated into a common system with responsibility for coordination of assisting agency resources and support to agency emergency operations.

MAFFS – Modular Airborne Firefighting System (Refers to the Military aircraft, C-130s, which are used as Air Tankers)

MAST – Mountain Area Safety Taskforce.

MODIS – (Moderate Resolution Imaging Spectroradiometer) – is a key instrument aboard the Terra and Aqua satellites. This instrument provided important intelligence for fire managers regarding fire perimeters and fire growth throughout the fire siege.

MOP-UP – Extinguishing or removing burning material near control lines, felling snags, and trenching logs to prevent rolling after an area has burned, to make a fire safe, or to reduce residual smoke.

MUTUAL THREAT ZONE (MTZ) – A geographical area between two or more jurisdictions into which those agencies would respond on initial attack. Also called mutual response zone or initial action zone.

NIFC – National Interagency Fire Center located in Boise, Idaho.

NPS – National Park Service

OES – The California Governor's Office of the Emergency Services.

OSC – (Operations Section Chief) The ICS position responsible for supervising the Operations Section. Reports to the Incident Commander. The OSC directs the preparation of unit operational plans, requests and releases resources, makes expedient changes to the Incident Action Plan as necessary and reports such to the Incident Commander.

PREDICTIVE SERVICES – Those Geographic Area and National-level fire weather or fire danger services and products produced by wildland fire agency meteorologists and intelligence staffs in support of resource allocation and prioritization.

PREPAREDNESS LEVELS – A national system of preparedness for incidents. The levels are 1 through 5. They are:

Preparedness Level 1 – Few or no active fires under 100 acres. Minimal or no commitment of fire resources. Low to moderate fire danger. Agencies above draw down levels.

Preparedness Level 2 – Numerous fires under 100 acres. Local commitment of resources for initial attack. Moderate fire danger. Agencies above drawdown levels and requests for resources outside local area are minimal.

Preparedness Level 3 – High potential for fires 100 acres & above to occur, with several 0-99 acre fires active. Fire danger moderate to very high. Mobilization of resources within the region and minimal requests outside of region. Agencies above or having difficulty maintaining draw down levels.

Preparedness Level 4 – Fires over 100 acres are common. Fire danger is high to very high. Resource mobilization is coming from outside the region. Agencies at minimum draw down levels.

Preparedness Level 5 – CALMAC is fully activated. Multiple large fires are common in the north and or the south. Fire danger is very high to extreme. Resources are being mobilized through the National Coordination Center. Activation of National Guard or military done or under consideration.

SANTA ANA WINDS – Is a type of Foehn wind. A Foehn wind is a warm, dry and strong general wind that flows down into the valleys when stable, high pressure air is forced across and then down the lee side slopes of a mountain range. The descending air is warmed and dried due to adiabatic compression producing critical fire weather conditions. Locally called by various names such as Santa Ana winds.

SOUTH OPS – The multi-agency geographic area coordinating center for southern California. Located in Riverside, it is staffed by CDF, State OES and Federal fire agencies.

STRIKE TEAM - An engine strike team consists of five fire engines of the same type and a lead vehicle. The strike team leader is usually a captain or a battalion chief. Strike Teams can also be made up of bulldozers and hand-crews.

SPOT FIRE OR SPOTTING – A small fire that is ahead of the main fire that is caused from hot embers being carried to a receptive fuel bed. Spotting indicates extreme fire conditions.

RED FLAG WARNING – Term used by fire weather forecasters to alert users to an ongoing or imminent critical fire weather pattern.

REHABILITATION – The activities necessary to repair damage or disturbance caused by wildfire or the wildfire suppression activity.

STATE RESPONSIBILITY AREA (SRA) - The California Board of Forestry and Fire Protection classifies areas in which the primary financial responsibility for preventing and suppressing fires is that of the state. CDF has SRA responsibility for the protection of over 31 million acres of California's privately-owned wildlands.

SLOP-OVER – A fire edge that crosses a control line or natural barrier intended to confine the fire. Also called break-over.

UNIFIED COMMAND – In ICS, unified command is a unified team effort which allows all agencies with jurisdictional responsibility for the incident, either geographical or functional, to manage an incident by establishing a common set of incident objectives and strategies.

WFSA – Wildland Fire Situation Analysis

WILDLAND/URBAN INTERFACE – The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

END