

AN ANALYSIS

LEARNING FROM OUR MISTAKES
LESSONS GLEANED FROM THE 1994 SHELTER DEPLOYMENTS
IN THE
SOUTHWEST AREA
AND THE
SOUTH CANYON FIRE-COLORADO

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Subject: Action Plan - An Analysis, Learning from our Mistakes

To: Forest Supervisors and Staff Directors

Enclosed are sufficient copies for District distribution of the analysis of the fire shelter deployments that occurred in the Southwest Area and the South Canyon fatalities, Region 2, during the 1994 fire season. This was done by the Region 3 Aviation and Fire Management Staff, with review by many fire management personnel throughout the Southwest.

In response to the recommendations in this analysis, the following will be our action plan, including assigned responsibilities and accomplishment dates:

<u>Action Item</u>	<u>Responsibility</u>	<u>Accomplish By:</u>
1. Initiate a request through appropriate channels for the National Wildfire Coordination Group to change the wording of Standard Fire Order Number 8 to read, "Establish and Maintain Lookouts at All Times" instead of "Establish Lookouts in Potentially Hazardous Situations."	Director, A&FM	1-15-95
2. Develop a "Fire Management for First-Level Agency Administrators" course to be presented to all Region 3 District Rangers in the spring of 1995.	Director, A&FM	3-1-95
3. Nominate District Rangers that have not attended a Fire Management for District Rangers/Agency Administrators course for the FMAA course to be held in Phoenix, March 6-10, 1995.	Forest Supervisors	2-1-95
4. Increase emphasis on observation of all safety standards at all Aviation and Fire Management meetings, conferences, and training sessions.	Director, A&FM	12-1-94 and Continuing

- | | | |
|---|---|------------|
| 5. Work with Southwest Fire Management Board partners to provide daily Fire Behavior predictions through the Southwest Coordination Center (SWCC). Provide daily Intelligence when Fire Preparedness Level 3 is reached. Provide weekly predictions beginning in Preparedness Level 2. | Director, A&FM | 2-1-95 |
| 6. Require Line Officer involvement and continuing personal input during management of escaped wildfires by: <ol style="list-style-type: none"> <li data-bbox="313 625 803 688">1. Developing the Escaped Fire Situation Analysis (EFSA) <li data-bbox="313 720 852 814">2. Line Officer conduct Briefing/ Direction to incoming Incident Management Teams <li data-bbox="313 846 885 934">3. Insure daily review and approvals of EFSA with the Incident Management Team. | Forest Supervisors and District Rangers | Continuing |
| 7. Provide visible, regular presence at representative fire operations on individual Forests and Districts. Fire operations include wildfires, prescribed fires, and fire meetings. | Forest Supervisors and District Rangers | Continuing |
| 9. Develop a "Safety Awareness" pin to provide to all personnel who participate in any safety training in 1995. | Director, A&FM | 12-15-94 |
| 10. Provide partner agencies with enough pins to provide to their personnel participating in safety meetings this year. | Director, A&FM | 2-1-95 |
| 11. Develop a letter from Regional Forester to the National Director, F&AM to request a national review of the current R&R policy guidelines and implementation practices. | Director, A&FM | 1-15-95 |
| 12. Develop a letter from Regional Forester to all Region Three Personnel as a reminder of Regional Forester's personal emphasis on safety in fire suppression actions. | Director, A&FM | 3-1-95 |

13. Develop input for Regional Forester's presentation to Fire Management for Agency Administrators course. Director, A&FM 2-15-95
Emphasis will be: "Safety is Job Number 1" and "Quality Management of Wildfire Operations."

You will notice that these action items are specific to Region 3, but are in line with and complement the action items that are to be implemented as a result of the Interagency Management Review Team analysis of the Investigation Report of the South Canyon Incident Fatalities (Colorado, 1994). I am providing a copy of this to our partner agencies with an encouragement to utilize this analysis and our action items as tools to assist in meeting their safety commitments.

Shelter deployments can be a symptom that we are not following all established safety standards to some degree. Each person, and especially Line Officers and Fire Management personnel in Region 3, need to lead by example. You have my encouragement and support to do the right thing--ALWAYS!

/s/ Louis Volk, Jr.
for
CHARLES W. CARTWRIGHT, JR.
Regional Forester

Enclosures

cc
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LEARNING FROM OUR MISTAKES

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LEARNING FROM OUR MISTAKES AN EXECUTIVE SUMMARY

An analysis of the investigation team reports for three Southwest Area and one Colorado fire shelter deployment was conducted by A&FM Assistant Director Bill Russell. This analysis focuses on the information provided in these reports and is supplemented by some personal knowledge of areas and events.

There were two different evaluation matrix tables used as the primary tools of analysis. One was a matrix of several standard items (fuels, fire behavior, management, etc.) that the National Wildfire Coordinating Group has identified as critical for evaluation in each shelter deployment. The second was a similar matrix evaluating the 10 Standard Fire Orders and the 18 Situations that Shout Watch Out! There was a disturbing trend in the matrix of the 10 and 18 for individuals involved to ignore more of the items as time progressed from the first shelter deployment on June 1 to the last event on July 6. This same trend was even stronger in the standard Entrapment Investigation Matrix items. As time progressed, it is interesting to note that more and more items in this matrix moved from the "did not contribute", to "influenced", to "significant contributor". This may be attributed to a cumulative fatigue factor that cannot be definitively specified from available information.

All investigation teams considered all personnel adequately to very well trained. In fact, the level of competence may be a contributing factor by compounding the fatigue factor with a "Can Do" attitude, resulting in more and more mistakes being made by "nap-walking" personnel.

A strong factor involved in the South Canyon-Colorado incident appeared to be a failure of management to provide detailed information to out-of-area personnel on both fuel types and predicted weather. This is also the responsibility of the firefighters, but management did not aggressively insure that the personnel they sent to the field were adequately prepared.

All levels of management in the Southwest Area need to be prepared earlier than we were this season to provide safety alerts and demonstrate actions that strongly indicate support by management for firefighting personnel and assuring that firefighters follow all established safety standards. This applies to all personnel, whether out-of-area or local.

All of the shelter deployments of 1994 involved fires burning in areas where only natural, renewable resources were involved. Manmade improvements were not a factor in these fire situations. Management did not provide strategies that indicated that personnel had options other than aggressive suppression.

Recommendations resulting from this analysis range from a strong need to return to basics, to a need for management to become more personally involved in fire suppression efforts. The primary recommendations that have national impacts would be: 1. Change the Standard Fire Order number 8 language to remove any ambiguity as to a need to post lookouts, and 2. Increase national attention on utilization of established work rest guidelines as maximums (currently) to minimums (especially during extended fire seasons).

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THE SITUATION

Region Three and the entire Western United States entered the 1994 fire season with a deadly combination of fuels and weather conditions. Fire Management personnel recognized this condition early on in the Southwest Area. There was much early season verbal discussion of the implications and need for aggressive initial attack. However, there was no formal documentation of conditions until the initial fire shelter events brought home to everyone the real degree of severity we were facing. From that time forward throughout our season, several different messages from management and fire behavior alerts were widely distributed throughout the Southwest, and shared with all other Areas through the Data General Network. This sensitivity to conditions and networking of alerts was picked up and continued by other Area Fire Management Personnel.

Early, aggressive initial attack resulted in a highly successful year as far as number of fires that were prevented from escaping. However, those that did escape initial attack became extremely large, dangerous fires that burned with rates of spread and fireline intensities that had not typically been seen in the Southwest for over twenty years.

The Southwest Area experienced three shelter deployment incidents from June 1 to June 14. The first two incidents occurred only two days apart in western Arizona on June 1st and southern Arizona on June 3rd. The third incident occurred on June 14th in west central New Mexico.

Each incident occurred in different vegetative types. The Mackenzie Fire burned in Desert Shrub/Chaparral. The Reserve Fire was in Desert Grasslands. The Coffee Pot Fire was in Mixed Conifer.

The three Southwest Area shelter deployments were followed by a fourth, deadly incident on July 6th on the Grand Junction District of the Bureau of Land Management in western Colorado. This incident occurred in Pinyon-Juniper fuel type mixed with Gambel Oak.

METHODS TO COMPARE THE INDIVIDUAL INCIDENTS

Fire shelter deployments have always been attributed to violations of the Ten Standard Fire Orders or the Eighteen Situations that Shout Watchout!, and/or a combination of this plus various fire behavior impacts, environmental factors, management control failures, and equipment failures. The National Wildfire Coordination Group, in January 1993, approved a standard investigation format for shelter deployment investigations. This format included a matrix for documentation of the various elements that should be evaluated. In addition to this standard format, Bill Russell developed, in August, 1994, a similar matrix for evaluation and documentation of the 10 Standard Fire Orders and the 18 Situations that Shout Watch Out!.

Each of the four shelter deployments have been evaluated either by the investigation teams, individuals involved in the shelter deployments, or by Bill Russell based on personal information and/or knowledge of the incident and actions. The matrixes for these evaluations are included in Appendix B.

Each of the shelter deployment investigations was reviewed for this analysis. Information gleaned from the reports is included throughout this analysis. A synopsis of each of the four incidents is included in Appendix A.

COMMONALITIES ASSOCIATED WITH THESE INCIDENTS

I. FIRE BEHAVIOR

Fuels

Significantly Contributed to events in all four incidents

As expected, due to the moisture conditions of all sizes of fuels going into this season, the fuels involved in each were identified as significantly contributing to each of the four incidents.

Weather

Influenced events on the Mackenzie, Reserve and Coffee Pot incidents.

Significantly Contributed to events on the South Canyon Incident.

Temperatures were high and relative humidities were low for the specific sites associated with each of these incidents.

Topography

Significantly Contributed to events on Mackenzie, Coffee Pot and South Canyon incidents.

Did Not Contribute to events on the Reserve Incident.

The Reserve Fire occurred on basically flat terrain.

Predicted vs. Observed

Significantly Contributed to events on the Mackenzie, Coffee Pot and South Canyon incidents.

Influenced events on the Reserve Incident.

The predicted vs. the observed fire behavior was a difficult factor to have matching this season due to the extremely dry fuels and erratic weather conditions experienced on most of the fires.

II. ENVIRONMENTAL FACTORS

Smoke

Did Not Contribute to events on the Reserve Incident.
Influenced events on the Mackenzie and South Canyon incidents.
Significantly Contributed to events on the Coffee Pot Incident.

Temperature

Did Not Contribute to events on the Coffee Pot Incident.
Influenced events on the Mackenzie, Reserve and South Canyon incidents.

Visibility

Did not contribute to events on the Mackenzie or Reserve incidents.
Significantly Contributed to events on the Coffee Pot and South Canyon incidents.

Slope

Did not contribute to events on the Reserve Incident.
Influenced events on the Mackenzie Incident.
Significantly Contributed to events on the Coffee Pot and South Canyon Incidents.

Other-Wind

Significantly Contributed to events on the Mackenzie, Reserve, and South Canyon Incidents.
In each case there was both a shift in direction and an associated increase in velocity.

III. INCIDENT MANAGEMENT

Incident Objectives and Strategy

Did Not Contribute to events on the Coffee Pot Incident.
Influenced events on the Mackenzie and Reserve Incidents.
Significantly contributed to events on the South Canyon Incident

Tactics

Did Not Contribute to events on the Coffee Pot Incident.
Significantly Contributed to events on the Mackenzie, Reserve, and South Canyon incidents.

Safety Briefings/Major Concerns Addressed and Instructions Given

Did Not Contribute to events on the Mackenzie Incident.
Influenced events on the Coffee Pot Incident.
Significantly Contributed to events on the Reserve and South Canyon incidents.

IV. CONTROL MECHANISMS

Span of Control

Did Not Contribute to events on the South Canyon Incident.
Influenced the events of the Coffee Pot and Reserve incidents.
Significantly contributed to events on the Mackenzie Incident.

Communications

Did Not Contribute to events on the South Canyon Incident.
Significantly Contributed to events on the Mackenzie, Reserve, and
Coffee Pot incidents.

Ongoing Evaluations

Influenced events on the Mackenzie and Coffee Pot incidents.
Significantly Contributed to events on the Reserve and South
Canyon Shelter incidents.

10 Standard Fire Orders

Violation of several of the 10 Standard Orders
was identified as Significantly Contributing to the need for the
shelter deployments on all four incidents.

18 Watch-Out Situations

Violation of several of the 18 Watch-Out Situations was identified
as Significantly Contributing to the need for shelter deployments
on all four incidents.

V. INVOLVED PERSONNEL PROFILES

Training/Quals./Physical Fitness

Did Not Contribute to events on the Mackenzie, the South Canyon,
and the Coffee Pot.
Lack of training was identified as influencing the need for a
shelter deployment on the Reserve Incident.

Operational Period Length/Fatigue

Did Not Contribute to events on the Mackenzie and Reserve
Incidents.
Fatigue was identified as Influencing the South Canyon Incident.
Fatigue was identified as Significantly Contributing to the Coffee
Pot Incident.

Attitudes

Did Not Contribute to events on the Mackenzie Incident.
Significantly Contributed to events on the Reserve, Coffee Pot,
and South Canyon incidents.

Leadership

Did Not Influence events on the Mackenzie Incident.
Influenced events on the Reserve Incident.
Significantly Contributed to events on the South Canyon Incident.
The investigation team felt that the outcome of events was positively influenced by leadership on the Coffee Pot Incident.

Experience Levels

Did Not Contribute to events on the Mackenzie Incident.
Influenced events on the Coffee Pot and Reserve incidents.
Significantly Contributed to events on the South Canyon Incident.
This can be tied in with the attitude factor.

VI. EQUIPMENT

Availability

Did Not Contribute to events on the Mackenzie, Coffee Pot and South Canyon incidents.
Significantly Influences events on the Reserve Incident.
Break-down of an engine was associated with change in operational exercise of planned tactics as well as a distraction of personnel attention from occurring fire behavior.

Performance/Non-Performance

Did Not Influence events on the Mackenzie and Coffee Pot incidents
Influenced events on the South Canyon Incident.
Significantly Influenced events on the Reserve Incident.
The South Canyon Shelter Deployments had two fatalities associated with two fully deployed shelters failing to perform as designed (may have been related to failure to deploy in the prescribed manner as well).

Clothing and Equipment/Used for Intended Purpose?

Did Not Influence events on the Mackenzie, Reserve and Coffee Pot incidents.
Influenced events on the South Canyon Shelter Incident.

VII. TEN STANDARD FIREFIGHTING ORDERS

1. FIGHT FIRE AGGRESSIVELY, BUT PROVIDE FOR SAFETY FIRST

Compromised by personnel on all incidents by failure to provide for safety first.

2. **INITIATE ALL ACTIONS BASED ON CURRENT AND EXPECTED FIRE BEHAVIOR**
Followed on the Mackenzie and Coffee Pot incidents.
Compromised on the Reserve and South Canyon incidents.

3. **RECOGNIZE CURRENT WEATHER CONDITIONS AND OBTAIN FORECASTS**
Followed on the Mackenzie, Reserve, and Coffee Pot incidents.
Did Not Follow on the South Canyon Incident.
The personnel on the South Canyon Incident did not obtain spot weather forecasts on which to base their actions. The personnel on the South Canyon Incident were also never briefed on the approaching cold front with predicted high winds.

4. **ENSURE INSTRUCTIONS ARE GIVEN AND UNDERSTOOD**
Followed on the South Canyon and Mackenzie incidents.
Compromised on the Coffee Pot and Reserve incident.

5. **OBTAIN CURRENT INFORMATION ON FIRE STATUS**
Followed on the South Canyon Incident.
Compromised on the Coffee Pot, Mackenzie and Reserve incidents.
Coffee Pot personnel lost contact with the Safety Officer who was supposed to be aware of the current status of the fire, and Reserve and Mackenzie personnel lost their awareness of current status of the fire.

6. **REMAIN IN COMMUNICATION WITH CREW MEMBERS, YOUR SUPERVISORS AND ADJOINING FORCES**
Compromised by personnel on all incidents to some extent.
The investigation team of the South Canyon Incident did not feel that this order had been compromised, but one of the smokejumpers involved did an analysis and felt that this had been compromised due to lack of communication with the Incident Commander (which was probably a result of confusion as to who really was the IC).

7. **DETERMINE SAFETY ZONES AND ESCAPE ROUTES**
Compromised on all incidents.
Personnel did not have adequate or established safety zones and escape routes, or were not clear to all personnel. Several escape routes also included uphill runs to safety zones across very unstable and steep terrain.

8. ESTABLISH LOOKOUTS IN POTENTIALLY HAZARDOUS SITUATIONS

Compromised on the Mackenzie Incident.

Did Not Follow on the Reserve, Coffee Pot and South Canyon incidents.

This resulted in a compromising situation where orders 1, 2, 3, and 7 are concerned.

9. RETAIN CONTROL AT ALL TIMES

Followed on all incidents.

The smokejumper on the South Canyon Incident felt that this was compromised due to failure to maintain communication with the IC.

10. STAY ALERT, KEEP CALM, THINK CLEARLY, ACT DECISIVELY

Followed on the Mackenzie, Reserve, and Coffee Pot incidents.

Compromised on the South Canyon Incident.

The investigation team and the smokejumper both felt that the personnel compromised this order primarily by failure to stay alert to changing conditions.

VIII. EIGHTEEN SITUATIONS THAT SHOUT WATCH OUT!

1. FIRE NOT SCOUTED AND SIZED UP

Not A Factor on the Mackenzie, Reserve, and Coffee Pot incidents.

Contributed to events on the South Canyon Incident.

The investigation team of the South Canyon Incident felt that this was a contributing factor in those shelter deployments. The smokejumper on the incident felt that though the fire had been scouted from the air, the failure to recognize and map fingers of the fire that may have been contributing areas during the blowup was enough to make this a significant factor in the deployments.

2. IN COUNTRY NOT SEEN IN DAYLIGHT

Not a factor in any of the incidents.

All occurred during daylight hours after the personnel had been on scene for some time.

3. SAFETY ZONES AND ESCAPE ROUTES NOT IDENTIFIED

Not a Factor on the Mackenzie Incident.

Contributed to events on the Reserve, Coffee Pot and South Canyon incidents.

The smokejumper on the South Canyon Incident felt that this was a Significant Contributor to the events. Personnel on all incidents had a lack of attention to this situation enough that this contributed in some ways to the shelter deployments.

4. UNFAMILIAR WITH WEATHER AND LOCAL FACTORS INFLUENCING FIRE BEHAVIOR

Not a Factor on the Reserve Incident.

Contributed to events on the Mackenzie and Coffee Pot and South Canyon incidents.

The investigation team and the smokejumper on the South Canyon Incident disagreed on this factor also. The team felt that it was a contributing factor, while the smokejumper felt that it was a significant factor. The host unit did not provide the out-of-area personnel briefings on the fuel types to be encountered or the predicted weather front, with associated red flag wind conditions.

5. UNINFORMED ON STRATEGY, TACTICS, AND HAZARDS

Not a Factor on the Coffee Pot Incident.

Contributed to events on the Mackenzie and Reserve incidents.

Significant Factor on the South Canyon Incident.

6. INSTRUCTIONS AND ASSIGNMENTS NOT CLEAR

Not a factor on any incident. -

On the Reserve Incident a change in alignment of resources caused some confusion and lack of attention to other critical factors, such as Situation 7, 12, 14, and 15.

7. NO COMMUNICATION LINK WITH CREW MEMBERS OR SUPERVISOR

Not a Factor on the Mackenzie, Coffee Pot and South Canyon incidents.

Compromizing factor on the Reserve Incident.

The investigation Team and smokejumper on the South Canyon Incident again disagreed. The team felt that this was not a factor, while the smokejumper felt that there was a failure to communicate to the IC and therefore was a contributing factor.

8. CONSTRUCTING LINE WITHOUT SAFE ANCHOR POINT

Not a Factor on the Mackenzie, Reserve and Coffee Pot incidents.

Significant Factor on the South Canyon Incident.

The investigation team and smokejumper both agreed on this factor.

9. BUILDING FIRELINE DOWNHILL WITH FIRE BELOW

Not a Factor on the Reserve and Mackenzie incidents.

Significant Factor on the Coffee Pot and South Canyon incidents.

10. ATTEMPTING FRONTAL ASSAULT ON FIRE

Not a Factor on the Mackenzie, Coffee Pot or South Canyon incidents.

The Reserve Incident was not designed as a frontal assault, but became one when the wind shift caused the fire to make a run at the persons involved in the shelter deployments.

11. **UNBURNED FUEL BETWEEN YOU AND FIRE**
Contributing Factor on the Mackenzie and Coffee Pot Incidents.
Significant Factor on the Reserve and South Canyon incidents.
The investigation Team and smokejumper on the South Canyon Incident again disagreed. The team felt that this was a significant factor, while the smokejumper felt that it was only a contributing factor.

12. **CANNOT SEE MAIN FIRE, NOT IN CONTACT WITH SOMEONE WHO CAN**
Contributing Factor on the Mackenzie and Coffee Pot incidents.
Significant Factor on the Reserve and South Canyon incidents.
Personnel on the Reserve Incident could see the main fire across the flat terrain, but because they were focusing on the equipment failure and movement of the BLM engine rather than the fire they failed to "see" the main fire as it changed directions. The Investigation Team and smokejumper on the South Canyon Incident again disagreed. The team felt that this was a significant factor, while the smokejumper felt that it was only a contributing factor.

13. **ON A HILLSIDE WHERE ROLLING MATERIAL CAN IGNITE FUEL BELOW**
Not a Factor on the Mackenzie, Reserve or Coffee Pot incidents.

Contributing Factor on the South Canyon Incident.
The investigation team and smokejumper agreed that it was a contributing factor.

14. **WEATHER BECOMING HOTTER AND DRIER**
Not a Factor on the Mackenzie, Reserve or Coffee Pot incidents.
Significant Factor on the South Canyon incident.
The investigation team and smokejumper agreed.

15. **WIND INCREASES AND/OR CHANGES DIRECTION**
Not a Factor on the Coffee Pot Incident.
Contributing Factor on the Mackenzie Incident.
Significant Factor on the Reserve and South Canyon incidents.

16. **GETTING FREQUENT SPOT FIRES ACROSS LINE**
Not a Factor on the Mackenzie, Reserve and Coffee Pot incidents.
Contributing Factor on the South Canyon Incident.

17. **TERRAIN AND FUELS MAKE ESCAPE TO SAFETY ZONES DIFFICULT**
Contributing Factor on the Reserve and Mackenzie incidents.
Significant Factor on the Coffee Pot and South Canyon incidents.

18. TAKING NAPS NEAR FIRELINE

Not a Factor on any incident.

The smokejumper on the South Canyon Incident felt that the fatigue factor associated with the long string of assignments by the smokejumpers could be classed as a contributing factor under this factor. The inattention to the Standard Fire Order number 10 and Situation 18 that Shouts Watch Out! can be equated to "nap-walking" (Analysis author's term) while still performing on the line.

COMMONALITIES IN THE TEN STANDARD FIRE ORDERS AND THE 18 SITUATIONS THAT SHOUT WATCH OUT! SUMMARY TABLE

DATE	INCIDENT					Total
	Mackenzie 6/1	Reserve 6/3	Coffee Pot 6/14	South Canyon		
				Team 7/6	ACPetrilli 7/6	
10 STANDARD FIRE ORDERS						
Followed	5	3	4	3	1	16
Compromised	5	6	5	4	6	26
Did Not Follow	0	1	1	3	3	8
TOTALS	10	10	10	10	10	50
18 SITUATIONS THAT SWO!						
Not a Factor	12	9	11	5	4	41
Contributed	6	7	4	4	5	26
Significant Factor	0	2	3	9	9	23
TOTALS	18	18	18	18	18	90

CONCLUSIONS

1. There are many obvious conclusions to be drawn from this analysis. The first of which is that Shakespeare was correct—"There is nothing new under the sun"—when we violate BASIC SAFETY STANDARDS AND RULES—BAD THINGS HAPPEN!
2. BASICS, BASICS, BASICS—There is no excuse for not doing what we are trained to do, yet we continue to do just that. Every shelter deployment can be traced to VIOLATIONS of the BASICS of SAFETY STANDARDS. These incidents are no different than incidents in our past history.
3. The combination of abnormally dry fuels, steep slopes, and erratic weather conditions results in critical and dangerous fire behavior. Early season failure by management personnel to recognize when we have critical conditions such as this year, and failure to adjust

actions based on this lack of recognition will place personnel at higher risk during suppression actions.

4. The combination of abnormally dry fuels, steep slopes, and erratic weather conditions becomes more critical and dangerous as the fire season progresses from our normal early season to what should be our normal critical fire season.

5. Failure to recognize the above item, by all ground personnel, results in individuals and crews compromising their own and other's safety.

6. During the last 15 years, we have come to expect a "break" between fire seasons from one Geographic Area to another. This did not occur in 1994.

7. Management of ALL incidents must be done in a thorough, competent manner. THERE ARE NO SAFETY SHORT-CUTS when it comes to preparing crews/individuals to go on the fireline. Management MUST develop incident objectives that are commensurate with values at risk, develop a complimentary strategy, and provide all the necessary briefings, including weather, management concerns, and support that is to be provided in order for the team/crew/individuals to develop and implement appropriate tactics.

8. There are no short-cuts to adherence to the 10 Standard Fire Orders and 18 Situations that Shout Watch Out!. Every item in these lists has resulted from injuries and fatalities in the past. This still remains the responsibility of each and every individual and crew on an incident. Management MUST increase the emphasis on following and observing these safety items. This emphasis must be reinforced during the incident briefings.

9. Posting of lookouts may appear to be optional due to the language used in the 10 Standard Fire Orders. If a crew cannot recognize potentially dangerous conditions, for any number of reasons, including violations of other items of the 10 and 18, they may not post a lookout. A lookout should be MANDATORY at all times. The majority of fatalities have occurred on sections of fires that were quiet or in light fuels-conditions which all too often we consider as not a potentially dangerous situation!

10. Failure to establish lookouts is the first broken link in the chain of communication that is necessary for firefighters to operate as safely as possible under dangerous conditions in all fire suppression actions. Relying on someone other than a member of your own group to be your lookout is a second broken link in the chain of communication. If a member of your own group is not your lookout then you don't have immediate communications often because the person you are relying on has moved from where you expect him/her to be.

11. Communications between individuals is critical. We often equate communication problems with equipment, but there is a more basic need for the individuals on an incident to recognize that each person is responsible for the safety of everyone, and failure to communicate perceived or actual dangerous or changing conditions is a step down the path toward injury and death to firefighters.

12. Attitudes are contagious. Bad attitudes are extremely contagious. We must prepare firefighters mentally as well as physically to fight fires. Mental preparation includes conscious recognition of physical limitations in relation to critical tasks and conditions. "Can Do Attitudes" should not be replaced by "Can't Do Attitudes"-but rather with "Can Do with Safety First Attitudes".

13. Fatigue must be recognized as a cumulative, potentially deadly factor by all personnel. On every incident, we tend to push crews and individuals to the limit of capability rather than striving to work for efficiency in the long run. Incident strategies and tactics (including R&R scheduling) often sacrifice long term well being of firefighting personnel on the altar of immediate need in incident management decisions. Theodore Roosevelt once said, "No man is justified in doing evil on the ground of expediency." To counter this tendency, the established work-rest guidelines should be taken as the MINIMUM that we must give crews and personnel during critical times rather than the MAXIMUM, as many teams consider. The current guidelines only provide the amount of rest that WELL CONDITIONED firefighters NEED TO MAINTAIN PHYSICAL AND MENTAL HEALTH.

14. An analysis of the matrixes of violations of the 10 and 18 seems to indicate that there is a direct relationship between extended time on fire assignments and increasing numbers of the 10 and 18 that are either compromised or ignored all together.

15. The 10 Standard Fire Orders and 18 Situations that Shout Watch Out! are not laws such that violation of one or two at a time will result in set, immediate repercussions. There are always times that one to several of these are not being actively, minute by minute, followed. However, these, like fatigue are cumulative—and are associated with cumulative fatigue. AS FATIGUE ACCUMULATES, THE NUMBER OF ITEMS THAT ARE VIOLATED OR IGNORED ACCUMULATES. THE END RESULT IS ALWAYS THE SAME—BAD THINGS HAPPENING!

16. This is not easily discernable from the above analysis, but a reading of the investigation reports continues to show that firefighters still sacrifice precious time and energy running with equipment rather than dropping the equipment in order to increase possibilities of escape from oncoming fire fronts.

RECOMMENDATIONS

1. Change the language of Standard Fire Order number 8 to read "**Establish and maintain lookouts at all times**". This should be emphasized during the incident strategy and briefing sessions when the LCES process is used to evaluate the proposed strategy and tactics for the upcoming shift.

2. Management must demonstrate by actions as well as words that lookouts are an important aspect of operations on the fireline. SPOT CHECKS by management personnel on lookout locations will demonstrate that this concern is real. There is a double benefit to this—not only will the crew have that first vital communication link in place, there will also be one person on a crew/group that is resting. At the end of a shift, the personnel will be in better shape, probably will have produced more, and most of all, will return all in one piece.

3. Management must increase emphasis on observation of basic safety rules and guidelines. If management is not truly interested in observation of these basics, we cannot expect others to be. This must be by actions and presence as well as by words. SPOT CHECK AGAIN.

4. Fire behavior expertise needs to be utilized earlier in each season, in all Geographic Areas.

This will provide early analysis of potential fire behavior and safety alerts for the fire season. This information should be shared among the Geographic Areas to insure that resources moving from one Geographic Area to another are made aware of the potential problem areas.

5. Develop an interagency Fire Behavior Analysis Computer Bulletin Board for safety alerts and general FBA information sharing throughout the fire season. Insure that fire and management personnel understand that information provided on this network is CRITICAL for every fire going person in the Southwest Area.

6. Every incident must be considered critical enough to provide a thorough analysis by management, followed by adequate time to provide complete briefings that prepare firefighters to provide suppression actions commensurate with values at risk. This is especially critical for personnel assigned from outside the fire area. Management must also demonstrate a commitment to protection of resources without sacrifice of personal safety.

7. Turning over an incident to firefighters does not relieve management of responsibility for the incident or safety of personnel. Management must continue to monitor conditions that affect firefighter safety and be prepared to provide additional instructions, including orders to leave the fireline, if conditions change from those identified in the briefings.

8. Communications must be continuous between personnel on the incident as well as between the incident and the fire host management.

9. Correct attitudes of "Can Do with Safety First" must begin with management. In order for management to understand and personify this attitude, MANAGEMENT MUST KNOW MORE ABOUT FIRE SUPPRESSION, AND BE MORE INVOLVED PERSONALLY IN FIRE SUPPRESSION. The best of intentions by uninformed and inexperienced managers cannot make up for unknowingly communicating wrong information or attitudes.

10. Establish "Can Do with Safety First" as the motto of the fire management organizations of the Southwest Areas.

11. National attention needs to be focused on changing attitudes of incident management teams in relation to use of personnel and provision of rest. Only when national management recognizes and directs that crews and individuals must be provided more than the minimum rest as seasons extend will this ever take place. This change can only be affected by specific policies agreed to by all agencies under the NWCG authority. Without such specificity of policies, incident management teams will continue to use resources as if their incident is the only show in town, and has been, and will be the only one all season!

12. As fire seasons become longer, and personnel are continuously on assignment with only minimal rest, management must increase emphasis, by written, verbal, and physical presence that increased attention needs to be placed on observing the 10 Standard Fire Orders and the Eighteen Situations that Shout Watch Out! Management must Walk the Talk!

13. Continue to preach the message that equipment must be discarded as soon as a decision is made that shelter deployments are about to take place. Seconds count when getting to a deployment site and entering a shelter. Anything that slows a person down is less than worthless from that moment in time on.

APPENDIX A

Synopsis of each of the four shelter deployments
analysed in this report.

Mackenzie Shelter Deployment Synopsis
Reserve Shelter Deployment Synopsis
Coffee Pot Shelter Deployment Synopsis
South Canyon Shelter Deployment Synopsis