

To Agency Administrators, All Agencies in Southwest Area and
All Fire Management Zones and Officers in Southwest Area and
National Fire Directors, BIFC

Lessons Learned from A Management Review of the Dome Entrapment Event

At the suggestion of the national office safety officers, Aldrich and Broyles, the Southwest Fire Management Board convened a management review team consisting of Bill Russell, Cliff Chetwin, Bob Lee and Nate Shourds to review the management of the Dome Entrapment Event. The review took place on June 3-4, 1996.

The following actions are the result of this review:

1. The SWFMB will review the Southwest Area Incident/Entrapment/Shelter Deployment Handbook to reflect increased emphasis on management review and appropriate protocol for Critical Incident Stress Debriefing in addition to the review of the process associated with the shelter deployments.
2. The Northern New Mexico Type II Team (Blackwell's Team) is directed to review their operating procedures to insure that lookouts are posted at all times as directed by the SWFMB in support of the "Don't Bet Your Life" pin and associated personal affirmation card.
3. The Northern New Mexico Type II Team (Blackwell's Team) and all other Type I and II Incident Management teams are reminded that extreme fire behavior continues to be the norm, and that past experience and preconceptions about fire behavior will not suffice for this season. Safeguards and preventative measures which would normally seem overly cautious must be taken routinely while our fire danger remains extreme.
4. The Northern New Mexico Type II Team (Blackwell's Team) is directed to review their operating procedures and take necessary steps to insure that strict compliance of tracking resources on and between divisions is accomplished.
5. Any investigation team in the future is encouraged to: 1) Take whatever time is necessary to complete an investigation, and 2) Take the time to sit down face to face with the IMT. This is a learning experience to prevent possible repetition of the same mistake the next day.
6. All IMT's are reminded that treatment of injured persons comes first before any investigation team needs.
7. All IMT's should review their standard operating procedures to insure that they have a standard protocol for handling emergency incidents. The protocol for Blackwell's team is attached for informational purposes.
8. All IMT's and firegoing personnel are reminded that during transitions on a wildfire, it is the responsibility of the outgoing IC to insure that all personnel are made aware of the transition schedule, and any personnel that will be retained as part of the new IMT. This must be accompanied by a positive communication between the chosen personnel and the incoming IMT to insure that

the transition truly occurs.

9. The Aviation Safety Sub-committee of the SWFMB is directed to review the information from this incident related to communications between the Air Attack ship and the ground forces. During the remainder of this fire season, the members of this sub-committee should discuss this issue with teams, among themselves, and are encouraged to be innovative and creative in new ways to communicate. At the end of the season, the sub-committee should develop a white paper for the Board to consider new policies related to Air Attack Communications. This white paper should be completed by December 1, 1996.

10. SWFMB will review the fire shelter refresher training requirements of all SWA agencies for consistency and adequacy to SWA needs.

The Southwest Fire Management Board sincerely hopes that distribution of this management review of this incident will increase the safety and effectiveness of future operations in the Southwest.

CLIFF CHETWIN
CHAIRPERSON
SOUTHWEST FIRE MANAGEMENT BOARD

encl Fire Shelter Deployment Investigation Report, Dome Incident
Management Review of the Dome Shelter Deployment
Northern New Mexico Interagency Incident Management Team: Protocol
for Critical Incidents.

MANAGEMENT REVIEW
OF THE
DOME ENTRAPMENT EVENT

DOME INCIDENT

SANTA FE NATIONAL FOREST
Southwestern Region, U.S. Forest Service

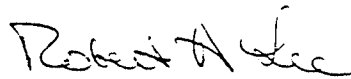
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SOUTHWEST FIRE MANAGEMENT BOARD

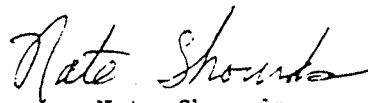


Bill Russell
U.S. Forest Service

Cliff Chetwin
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Bob Lee
Bureau of Land Management
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June 3-4, 1996

SOUTHWEST FIRE MANAGEMENT BOARD
MANAGEMENT REVIEW
OF THE
DOME ENTRAPMENT EVENT
SANTA FE NATIONAL FOREST

Following the release of the Shelter Deployment Investigation Report of the events surrounding the handcrew and engine crew entrapments on the Dome Incident, questions have surfaced as to the management provided by the Northern New Mexico Type II Incident Management Team (Garry Blackwell IC). Paul Broyles (NPS National Safety Officer) and Dave Aldrich (USFS National Safety Officer) visited the Southwest Area on May 15 and 16. During this visit the Dome entrapment sites were visited and the investigation report was reviewed. These two national leaders suggested to the SWFMB that a second level review of the incident be conducted. This was suggested as a possible standard approach.

The Southwest Fire Management Board, as the second level coordination/oversight group, discussed this suggestion in a conference call on Friday, May 31. At this time there was consensus to have Bill Russell, Bob Lee, Cliff Chetwin and Nate Shourds conduct this review on Monday and Tuesday, June 3 and 4. Objectives identified by the SWFMB for this review were: 1) Expand beyond the process review of the entrapment investigation report to look at the management decisions that led up to the entrapment and throughout incident; 2) Evaluate implementation of this second level management review as a standard process in future entrapment investigations, and; 3) Evaluate the current Southwest Area Incident/Entrapment/Shelter Deployment Handbook for adequacy and effectiveness.

On Monday, June 3, the four board members met at the Santa Fe office of the National Park Service from 0800 to 1700. The entire day was spent with the command and general staff of Blackwell's team, plus several individuals involved in the Division C entrapments on April 26. Those present were:

Bill Russell, USFS, SWFMB	Ken Bunt, USFS, Ops Chief
Cliff Chetwin, NPS, SWFMB	Crockett Dumas, USFS, Ops Chief
Bob Lee, BLM, SWFMB	Marcus Trujillo, USFS, Ops Chief
Nate Shourds, BIA, Acting SWFMB	Rich McCrea, BIA, FBAN
Garry Blackwell, NMS, IC	Darrell Abeyta, USFS, Safety Officer
Gilbert Romero, NMS, Finance	Bob Cordts, USFS, Plans Chief
Ken Bishop, NMS, Air Attack	Tom Mott, USFS, FIO
Dean McCalister, USFS, Log Chief	Larry Chinana, USFS, CREP Jemez SWFF
Tony Tanuz, USFS, Eng Op Eng 5	

On Tuesday, June 4, the team (without Chetwin) met in the Regional Office to continue deliberations. David Garcia, NPS Eng Op, Eng 91 came at the request of the team to present the actions of the engine crews during the day of April 26.

The following is a chronology of events with corresponding team actions and decisions from initial reporting on scene to the investigation process.

MANAGEMENT CHRONOLOGY
DOME INCIDENT AND SHELTER DEPLOYMENT
SANTA FE NATIONAL FOREST

EVENT	INCIDENT MANAGEMENT TEAM ACTIONS
<p>4/25 2200-2400 EFSA and Delegation of Authority were presented to IMT with recognition that resources will be slow to arrive, and IHC's will not be available.</p> <p>Haines Index for ABQ was 4.</p>	<p>IMT recognized that the selected alternative in EFSA was not viable and agreed with Line Officer to operate for Day Shift 4/26 with penciled adjustments before doing an official update of EFSA that could reflect current and projected fire behavior, team accomplishments and resource availability</p>
<p>4/26</p> <p>0001-0400 Extended attack tactics were to hold west end of fire and to burn out along FSR 142 to establish and secure the south flank.</p> <p>Fire burned across the junction of FSR 289 and 142, and spotted south of FSR 142 in vicinity of Drop Point 3. Total burned area as reported on ICS 209 was 300 acres. Fire was approximately 400-450 acres by shift change (transition to Type II IMT) at 0600.</p> <p>Haines Index forecast for ABQ was 3</p>	<p>IMT transition with IA team begins. Ops Section Chief Dumas was on the line all night to gather intelligence and provide input for the 4/26 shift plan.</p> <p>Extended attack crews worked to contain the slopover at junction of 142 and 298 and did not complete the planned burning along FS 142 to secure the southern flank. During the night, Engine 91 was caught on east side of slopover and had to wait for fire to subside before coming back on to FSR 289.</p>
<p>0600-1300 Fire was burning with only moderate intensity. Slopover at the junction of 142/289 had been mostly contained by 0600. Winds were light. Along FSR 142 there was a 1/2 mile section of unburned line between the east edge of the slopover at the 142/289 junction and the slopover at DP 3. The unburned gap was along a south facing slope with fire just beginning to back downslope with flame lengths of less than one foot. This is not considered to be a current threat to this section.</p>	<p>IMT objectives for day were to establish a strong anchor point along FSR 289 and hold the line established during the night. Instructions for the day shift included keeping one foot in the black at all times. Type II IMT took full control of the incident at 0600. The slopover SE of DP 3 was lined and a dozer line north was begun. Crews from Div B scouted a possible handline east from 289 into the head of Capulin Canyon. Air Attack, Ops, Safety, Div B and FRAN watch the unburned island throughout the day.</p>

EVENT	INCIDENT MANAGEMENT TEAM ACTIONS
<p>1300-1400 Fire intensity and behavior was still observed to be moderate on all portions of the fire. Acreage had grown to approximately 550-600 acres. Winds were still light from West to Southwest.</p>	<p>Radio technician attempts to program the radios for everyone on the line. Radios for the Black Mesa Crew will not allow field programming to take place. CREP from Santa Domingo Crew is assigned to serve as radio contact with Black Mesa Crew.</p> <p>FBAN was located on Dome Lookout to observe fire behavior and record weather conditions. Ops Chief Marc Trujillo and Div C Ken Schein decided to keep crews on roads 142 and 289.</p> <p>This decision was based on the lack of safety zones and escape routes for crews away from the roads. On the roads, nearby burned areas were designated as safety zones.</p>
<p>1400-1500 Fire intensity and behavior did not changed appreciably</p> <p>Air Attack notifies Div C Schein that fire behavior in the interior of the burn is picking up. Spot fires then begin to appear, but do not increase appreciably until wind shift occurs.</p>	<p>FBAN traveled from Dome Lookout back along FSR 142 to Div A, observing the fire as he passed through Div C Winds are observed to be very light.</p> <p>Ops Dumas & Trujillo & Dep. Ops Bunt fly recon in preparation for night operational period.</p> <p>IC Blackwell was above in a separate helicopter observing fire behavior and crew activity.</p>
<p>1500-1600 Winds began to increase slightly (4-5 mph at RAWS station), gradually shifting from SW to NW. Increase in winds is sufficient to begin to intensify observed fire behavior within the fire interior as well as to produce spotting across FSR 142 consistent with shift in wind direction. Aerial observation of the 1/2 mile gap of unburned fuel along FSR 142 showed a moderate backing fire with less than 1 foot flame lengths working down the hill toward FSR 142. From 1530 to 1600</p>	<p>Div C Ken Schein requests an engine from Div A Duane Archuleta to assist crews with spot fire control. Black Mesa Crew radios still cannot be programmed to match incident, frequencies by the radio technician. During this time, in addition to the CREP Larry Bird (DIVS qualified), the archeologist, Bill Wyatt, that had been working with the dozer is also assigned by Div C to help with communications for Black Mesa Crew.</p> <p>One engine that came to Div C from</p>

EVENT	INCIDENT MANAGEMENT TEAM ACTIONS
<p>spotting intensity and occurrence increased along Division C. Resistance to control for spots was rapidly increasing.</p>	<p>Div A was observed by Div C Schein but there was no positive handoff of the engines between the divisions.</p> <p>Div C Schein was not able to maintain radio contact with Air Attack even though aircraft was in the area</p> <p>Close to 1600, Div C, Schein, drove back along FSR 142 to determine the extent of road that was compromised by too many spot fires burning out of control. He contacted all the hand crews on Div C and instructed them to proceed to the safety zones. Egress to the west from DP 3 along 142 was considered but rejected based on Div C's personal observations of burning conditions and since this would take crews away from the black (safety areas).</p>
<p>1600-1700 Intense fire activity built in the interior of the burn. A crown fire developed inside the line which made runs at the line, throwing brands over the line, and the fire started a run to the east in Capulin Canyon. Spot fires south of FR 142 burned together and moved rapidly to the south and east toward Dome Lookout.</p>	<p>Santo Domingo Crew moved into the burned area at the slopover near DP 3. Shelters were removed from cases, but did not open, as there was no direct threat to crew.</p> <p>Div C Schein is located with Black Mesa Crew in a nearby black area. Some of the new crewmembers are nervous, so the crew boss has the crew scrape deployment sites and then pull their shelters. This is mostly to give everyone something productive to do. Shelters are removed from protective cases by crewmembers as a precautionary move.</p> <p>Jemez CREP Larry Chinana told Schein that the crew was moving into a grassy, open area for their safety zone rather than come up near DP 3. This new safety zone had been identified as a better zone by the lookout. This location was closer to the crew than the safety zone near Schein's location by DP 3. The crew eventually deployed their</p>

EVENT	INCIDENT MANAGEMENT TEAM ACTIONS
<p>1700-1800 Extreme fire intensity continues, but with only approximate 80 chains per hour rate of spread to the east down Capulin Canyon and along the north side of Sanchez Cyn.</p>	<p>shelters primarily as a heat shield. There was no direct flame impact on the crew in this safety zone, or on the other handcrews in their safety zones.</p> <p>Engines 5 and 91 proceeded east along FSR 142 toward Dome Lookout. Approximately every 1/4 mile the engines stopped to observe the progress of the fire in the canyons on either side of FSR 142.</p> <p>Engines 5 and 91 stopped approximate- 1/4 to 1/2 mile from Dome Lookout, feeling that they would not be able to reach the lookout for a safety area. They chose to make their stand in a relatively open area. The two heads of the fire came together near this location, making a total of three runs at the crews. Engine 5 was ignited during the 3rd run and destroyed. One crewmember lost his gloves and received burns to his arms and hands during the 50 minute long deployment. The NPS Engine 91 maintained contact with Division A and the local NPS FMO during the incident-rather than with Division C. The Division A Supervisor, Duane Archuleta, had been the Initial Attack IC, and Engine 91 had been the first unit on the fire.</p> <p>Ops Dumas and Trujillo & Dp.Ops. Bunt were flying the southern flank. Dumas and Trujillo make a decision that they need to get on the ground to direct operations at the site, while Bunt remained airborne.</p> <p>As the Engine crewmembers emerge from shelters at 1750, Dumas arrived and moved Engine 91 away from the burning Engine 5. The crews are evacuated in Engine 91</p>

EVENT	INCIDENT MANAGEMENT TEAM ACTIONS
<p>1800-2400 Regional Office is in contact with Acting Forest Supervisor and the decision to transition to a Type I IMT is made based on a discussion with Deputy RF about the political sensitivity of the incident location near Los Alamos National Lab</p> <p>Blackwell's IMT are notified of the decision to change to Type I team and begin transition operations.</p>	<p>and Dumas' vehicle.</p> <p>IC Blackwell calls entire Command and General Staff plus principals involved in the entrapment together to review the team protocol for management of critical incidents. Team Safety Officer Darrel Abeyta is assigned as IC of the incident, Dep. IC Ron Masewiestewa is assigned as as DIC for the incident, Comp and Claims Chris Sedillo is assigned as the final team member. A Critical Incident Stress Debriefing team is ordered with a request to be in place in twelve hours.</p> <p>Individuals involved in the entrapment are held in camp in anticipation of an investigation team arriving. The burn victim is held in camp following first aid and bedded down in an ambulance.</p>

CONCLUSIONS:

A. ENTRAPMENT

The entrapment was caused when a crown fire developed in the interior of the burn, reburning through the crowns and throwing burning material over the southern flank (FSR 142) when the wind shifted from SW to NW and increased speed around 1500.

B. MANAGEMENT ACTIONS

1. The EFSA that the forest had developed with a selected alternative of holding the fire to 2,000 acres was recognized by the IMT and Line Management as not attainable during the team briefing.
2. The Blackwell Incident Management Team transitioned into control of the Dome Incident during the midnight to 0600 period of April 26. The transition was complete well before the entrapment incident.
3. To the best of the team's knowledge, all line personnel, including crews, were provided copies of the day shift plan by Ops or DIVS in the early part of the day shift.

4. Blackwell's IMT operates with three Ops Chiefs. The afternoon of the shelter deployment, all three Ops Chiefs were on the line or in the air the entire time. All three Ops Chiefs were on or over the line of Division C.
5. Direction of the IMT was to "post lookouts at all times". Lookouts were posted to a limited extent. The flat terrain and heavy smoke did not permit anyone on the line to be in a position to view the fire and still be in communication with their crews. Communication with aerial observers was used as a key "lookout" input by personnel along the divisions. It may have been possible that a lookout placed on the ridge to the west of FR 289 would have been able to view the main fire and provided a warning about the increasing fire activity in the drainage north of FR 142.
6. Engines assigned to Div A and C had been part of the initial attack forces on April 25, and on April 26 were still operating in the initial attack mode. The Initial Attack IC became the Division A supervisor, but he still served as the engine's primary contact, even when they were assigned to another division. The engines did not establish and maintain contact with the Division C supervisor when they were assigned to that division. The Division supervisors did not make a positive handoff with the engines when they crossed into the adjacent division. The uncoordinated nature of the engines' assignments and their actions during the late afternoon allowed them to fall through the cracks when the fire took off.
7. Management of the personnel involved in the shelter deployment did not meet the needs of the injured persons. The burned victims were not transported to a hospital in a timely manner for treatment beyond first aid administered by camp medical unit.
- 8. Comparison of the Dome Fire Shelter Deployment Investigation Report and information gathered during this management review indicate that the current Southwest Area and NWCG guidelines for entrapment and deployment investigations need review. Sufficient emphasis must be given to the incident management actions and decisions preceding the event.

C. TACTICAL ACTIONS

1. The potential for extreme fire behavior was recognized and addressed by the IMT. The tactics for 4/26 and direction to operate with one foot in the black were appropriate for the fire behavior that was experienced and forecast for that day.
2. The incident objectives for April 26 were to anchor and hold existing line to the extent possible with existing and expected forces. There were three handcrews and two engines on Division C. Lack of resources was not a factor in the entrapment incident.
3. There was a narrow strip, less than 1/2 mile long, of unburned fuel along FSR 142 in Division C. Fire in this part was burning slowly and moderately down a slope toward the road. This section was not a factor in the fire jumping FSR

142, although it could have provided another safety area if it had been burned out early in the day shift.

4. The handcrews along FSR 142 worked with one foot in the black throughout the day, with the exception of the engine crews. Burned over areas were designated as safety zones. When the fire blew up, there was an orderly retreat to the nearby safety zones. The shelters were pulled to shield people from the heat and smoke while the crown fires passed by the safety zones.

5. Retreat by the Division C crews to the west along FR 142 was prevented by the long distance from DP 3 (1/2 mile) to the 12 hour old black associated with the slopover that covered the junction of FSR's 289 and 142. This area would have been subject to threat of crown fire when the fire jumped the road and would have put the crews at risk had they chosen to attempt to retreat toward DP 2 rather than enter safety zones near their work locations.

6. The team was well aware of the potential for extreme fire behavior, but the forecasts and predictions issued called for moderate fire behavior. The tactics were developed accordingly, and when the fire blew up, the predesignated safety zones were used successfully by the handcrews. The engines did not retreat to the black, and were forced to deploy shelters on an open stretch of FR 142.

D. FIRE BEHAVIOR AND WEATHER FACTORS

1. The New Mexico fire behavior forecast put out by the National Weather Service on April 26 predicted a lower Haines Index than for April 25. Winds were expected to be 15 to 20 mph at the 20 foot level. Moderate fire behavior was forecast, with an announced potential for extreme fire behavior based on the condition of the fuels.

2. On 4/26, the fire behavior experienced prior to 1500, when wind shifted and increased, was consistent with the forecasted weather and associated fire behavior prediction. With a Haines Index of 4, the fire burned 300 acres on 4/25 from 1500 to 2400. The Haines Index for 4/26 was 3. Prior to 1530 on the 26th, approximately 250-300 additional acres had burned.

3. The increase in wind speed associated with the shift in direction, from SW to NW, contributed to the buildup of crown fire within the burn area. The orientation of the drainage in which the fire was located contributed to the effect of the wind. The drainage runs from northwest to southeast.

RECOMMENDATIONS:

1. SWFMB review and update the Southwest Area Incident/Entrapment/Shelter Deployment Handbook to reflect:

*Increased emphasis on management review in addition to the process review on incidents.

*To assure that protocols and timeframes regarding the use of Critical

Incident Stress Debriefing services are clearly defined.

*Revise the time frames and products for the investigations so that a brief, concise review of the incident is available in a timely manner to the field, but an in-depth review of all the management and individual actions can be developed by the investigation team.

2. The Northern New Mexico team should take steps to insure the posting of lookouts on the line, and when the fire can not be seen by the people on the line, post a lookout to track the progress of the fire.
3. The Northern New Mexico team (and all Incident Management Teams assigned to fires in the Southwest) should be fully prepared for extreme fire behavior. The fire behavior during the early part of the 1996 season in the Southwest has been more severe than has ever been observed before, so preconceptions and assumptions based on previous experience should not be depended upon. Safeguards and preventative measures which would normally seem overly cautious must be taken routinely while the fire danger remains extreme.
4. The Northern New Mexico team should take steps to insure strict compliance of tracking resources on divisions and as resources are reassigned to another division.
5. SWFMB encourage shelter deployment investigation teams and IMT's to utilize a group meeting to discuss management actions and decision processes for the entire shift time involved in an incident. This can be as little as a couple of hours while the command and general staff are together, i.e. preceding or following strategy sessions, or in cases where the IMT is transitioning off an incident, before the IMT leaves for home.
6. SWFMB remind all IMT's in SWA that ANY serious injury (which includes any burn of 2nd degree or worse) requires that the injured person be transported immediately upon stabilization to the nearest medical facility for treatment. After treatment, the individuals can be returned to a point where investigation teams can interview in a positive atmosphere.
7. SWFMB provide direction to all IMT's in SWA to establish a team protocol that will result in a specific team member accepting assignment as Deputy Incident Commander in charge of the incident within the incident. Responsibility will be to manage all aspects of caring for victims, protecting sites and evidence, liaison to investigation teams, and liaison to the host agency and SWFMB. SWFMB can share the written protocol of Blackwell's team as a sample.
8. SWFMB remind all personnel in Southwest Area that during a transition from one level of suppression to the next, the outgoing Incident Commander must communicate to all personnel the upcoming transition time and any members of the outgoing team that will be retained as a part of the new Incident Management Team. There must be clear communication to establish the new chain of command for/to all transitional personnel.

9. SWFMB assign the question of communication problems from ground to air attack to the SWFMB Sub-Committee on Aviation Safety to research, try innovative approaches, etc. during the remainder of the 1996 fire season, and then develop a white paper for the Board for consideration of new area policy this fall.

10. SWFMB will review the fire shelter refresher training requirements of the various SWA agencies for consistency and adequacy to SWA needs. If these are determined to be inadequate, a policy statement will be prepared for implementation no later than the 1997 fire season.

NORTHERN NEW MEXICO INTERAGENCY INCIDENT MANAGEMENT TEAM:

PROTOCOL FOR CRITICAL INCIDENTS

A critical incident is any significant event outside the standard operating procedures. For example: death, shelter deployment, rape, aircraft accident, or any traumatic injury.

As Incident Commander, my job is to manage the situation for the safety and well-being of the individuals.

Steps to take in the event of a critical incident:

1. Remove those involved from the scene. If it is fire-related, have a responsible representative move the crew to the nearest town where they can get cleaned up, relax, eat. Do prevent excessive behaviors such as drinking.
2. Contact Zone Dispatcher and request a Critical Incident Stress Debrief (CISD) Team. Inform the crew of this action.
3. The CISD Team should be called within 12 hours and arrive within 24 to 48 hours after the incident.
4. Assess who else may need debriefing (i.e. first responders, others attached to the critical incident).
5. When a critical incident occurs, there is often an impact on the Incident Command Staff. You and your staff are encouraged to meet with the CISD Team.
6. Keep crew and others informed of the status of the injured. If there is no information, tell them that.
7. The CISD Team should precede the Investigative Team.
8. The CISD Team should be consulted prior to releasing the crew involved in the critical incident.

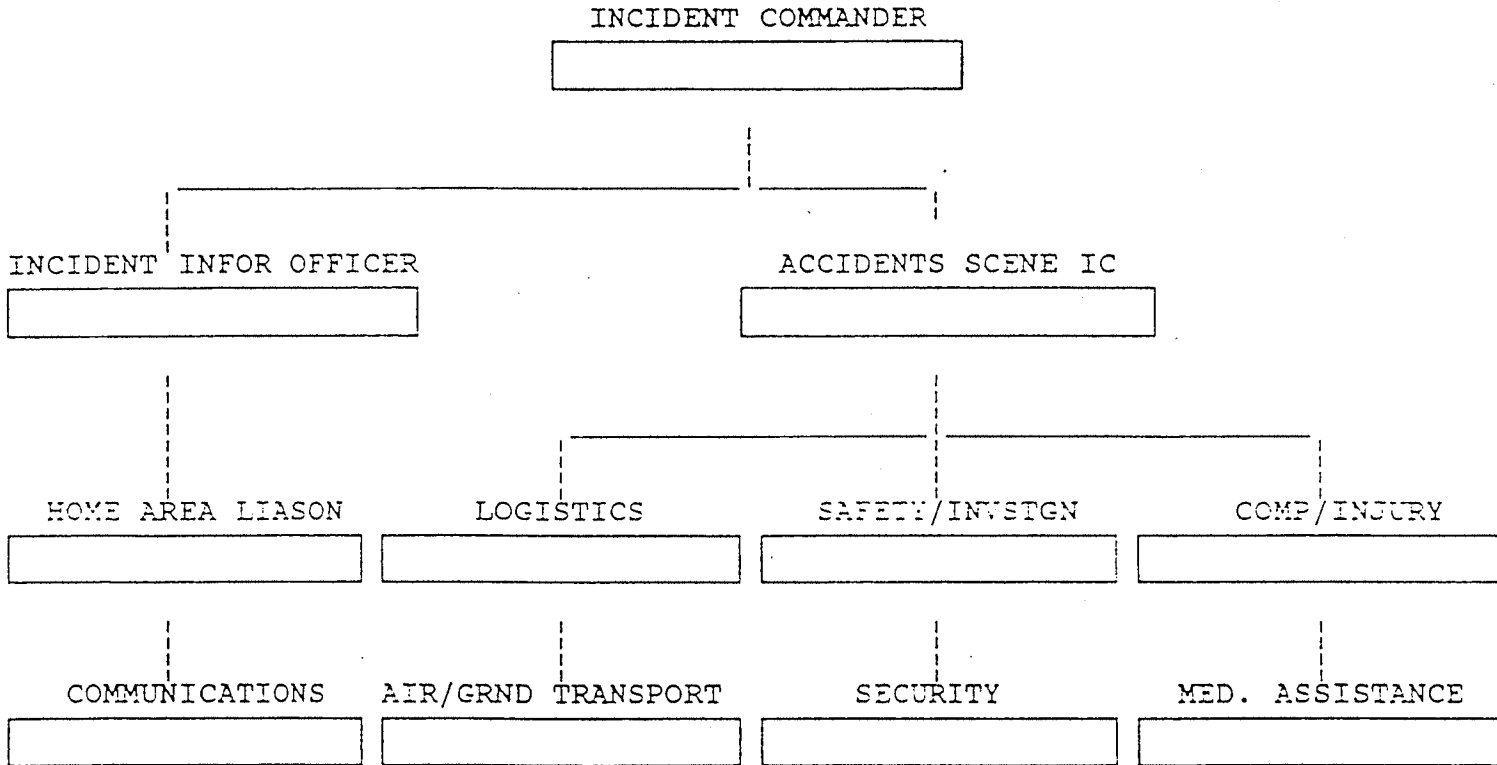
DON'T ENCOURAGE DRINKING ACTIVITIES AMONG THE AFFECTED CREW MEMBERS.

DO KEEP THE CREW INTACT.

INCIDENT: _____

SERIOUS ACCIDENT ORGANIZATION

Accident I. D.: _____ Date: _____



AIRCRAFT OR SERIOUS INJURY ACCIDENT CHECKLIST

Incident commander must approve all release of information outside of the incident organization.

Date and Time

Completed:

1. _____ Provide for victims, obtain suitable transportation to hospital.
2. _____ If death(s) results: DO NOT MOVE DECEASED.
3. _____ Secure site, protect evidence, relay information on need for coroner to supervisor, safety officer, or incident commander.
4. _____ Do not release information to anyone except to supervisor, safety officer, or overhead team members.

DO NOT TRANSMIT NAMES OR INFORMATION ON RADIO

Agency Line Officer in charge of the fire is the only authorized source of information on names, etc. of victims.

5. _____ Identify witnesses. Insure availability of witnesses to the safety officer for statements as soon as possible. Witnesses should not discuss include until formal statements have been taken.
6. _____ Immediately notify the incident safety officer who will coordinate the preliminary investigation, take statements and confirm the following notifications:
 - A. _____ Incident Commander or deputy incident commander:
 - (1) _____ Coordinates with Agency Line Officer.
 - (2) _____ Coordinate information flow with designated agency representative when supervisor is unavailable.
 - B. _____ Operations section chief:
 - (1) _____ Handles line coordination problems in line organization.
 - (2) _____ Air Operations Director:
 - (a) _____ Arrange air transportation as needed.
 - (b) _____ Coordinate air mission, resolve conflicts.
 - (c) _____ Confirm hospital notifications if victims are transported by air.

- (d)_____Notifies air investigation unit as needed.
- (e)_____Notifies region, zone or state air safety officer.
- (f)_____Notifies FAA as necessary.
- (g)_____Notifies contracting officer of the aircraft.

C._____Finance Section Chief:

- (1)_____Compensation/Claims Unit Leader.

D._____Planning Section Chief:

- (1)_____Resource Unit Leader.

E._____Logistics Section Chief:

- (1)_____Medical Unit Leader.

F._____Liaison Officer:

- (1)_____Agency Representative.

G._____Information Officer:

- (1)_____As requested, arrange for photo documentation.
- (2)_____Handles all media releases following agency Line Officer approval via incident commander.

WHEN TO CALL A DEBRIEFING

Kendall Johnson, Ph. D., Critical Incident Stress Advisor
NFPA Wildland Fire Management Section

I frequently talk to supervisors and Incident Commanders who are uncertain as to whether they should have called a debriefing. At conference presentations I am also asked by managers to address the issue of just when to call a debriefing. While there are no hard and fast answers to this question, here is how I look at it.

Some agencies have mandated debriefings following certain types of incidents (e.g., fire shelter deployment), while others rely upon supervisor's observations of signs of acute stress response. Managers and commanders do not want to call unnecessary debriefings, nor do they want to ignore legitimate need.

I see the decision as consisting of four factors:

Factor 1: Type of Incident

I first look at the severity of the incident. Did the incident involve loss of life? If the death was another employee, particularly someone on the crew, then a debriefing probably should be called. Did the incident involve personal responsibility on an employee's part? Were there overwhelming sights and sounds involved? Were the employees exhausted prior to the incident? The more the employees were involved with the incident, the more likely the debriefing should be called. Some agencies regard events such as fire shelter deployments as immediate grounds to call a debriefing.

Factor 2: Reaction of Employee(s)

I look for the various signs of acute stress reaction as discussed above. In general, the more the crew is acting "differently" than they usually act, in the estimation of the supervisor, the more likely a debriefing is needed. I usually try to get several people to comment on this, however, as some supervisors either are not aware of critical incident stress reactions, or are reluctant to admit it. The same can be said for the employees themselves, as they typically try to minimize their own pain.

Factor 3: Background

Events that may not affect one group may be very difficult to another, depending upon various background factors. I ask about the cohesiveness of the group of crew, and about any issues they are dealing with which would influence their experience of the event. I ask about their fatigue level, and what they have been doing recently. (Most importantly, I try to find out whether they have gone through any similar incidents in the past. Generally, the more background factors there are which could leave the group or its members vulnerable to the effects of the critical incident, the more likely they are to need a debriefing.

Factor 4: Supervisor or Employee Request

Finally, if members of the group have requested a debriefing, I do not question it. If supervisors have requested the debriefing, I try to find out more about what they are seeing that they are concerned about. If the supervisor wants it but the crew doesn't, then I need to know whether their resistance comes from minimizing their hurt or from distrust and struggle with the supervisor.

The Decision

As in any multi-factored situation, the final decision is a judgement call. If any of above factors clearly indicate, that the need for a debriefing is likely, then it should be held. If several of the factors seem strong, it probably should be held. If you are not sure, find someone who knows more than you do and discuss it with them, including the contractor you plan to use. If it's still a toss up, bring the contractor on the scene, and turn the assessment over to him or her.

Who to Call?

It's hard to find good help? Assessing proposed debriefing services is difficult, particularly if you're not sure what you're looking for.

This is probably the hardest issue of all, because of the unique set of skills a good debriefer must have. I see them to be:

Clinical Training

Because the debriefer must assess and refer participants in case of severe disturbance, good clinical training is important. The debriefer will also be called upon to make recommendations regarding fitness for duty.

*Agency (or related) Experience

While all organizations have their own culture, history and issues, wildland agencies tend to be politically and culturally intensive. The debriefer must understand the issues and speak the language.

*Structured Mode/Flexible Plan

Agency personnel are familiar with and expect structure. As each situation is unique, the debriefer not using Mitchell's structure should be able to explain why not.

Wildland Emergency Experience

Crisis conditions tend to be unusual, and for the debriefer to make sound judgements as to what is or is not normal, under the given conditions, he or she must be familiar with emergency conditions. Further, because of the prolonged and often extreme conditions encountered in the

wildlands, that experience should include wildland emergency.

Nationally, employee assistance programs are leaping on the debriefing bandwagon. In their haste, they often claim to provide debriefing services when in fact they do not. Their people are sometimes poorly prepared and the services equally poorly conceived. Often they have good clinicians whose experience is limited to the emergency room. Such people have difficulty finding their way around a fire camp, understanding ICS, relating to wildland issues and language, and assessing just what is and isn't normal appearance and behavior under wildland emergency conditions. Let's face it, some of you folks aren't all that pretty after three or four days on the line! The above criteria should help managers in evaluating proposed services and personnel.



United States
Department of
Agriculture

Forest
Service

Santa Fe
National Forest

P.O. Box 1689
Santa Fe, NM 87504
505 988-6940


Reply To: 5130

Date: May 9, 1996

Subject: Dome Fire, Investigation of Fire Shelter Deployment on
April 26, 1996

To: District Rangers

Enclosed is a copy of the Fire Shelter Deployment Investigation Report for the deployments which occurred on the Dome Fire on April 26, 1996. I know you are interested in both the findings and the recommendations. My hope is that this will help insure we don't have a repeat.


ALAN S. DEFLER
Forest Supervisor

Enclosure

cc:
Gary Blackwell, State Forestry
Roy Weaver, Bandelier
R. Rodriguez
P. Neff
J. Romero
R.O. - Fire
R.O. - Safety
Regional Forester
Deputy Regional Forester, Resources

Caring for the Land and Serving People





File Code: 5130
Route To: 6730/5130

Date: May 2, 1996

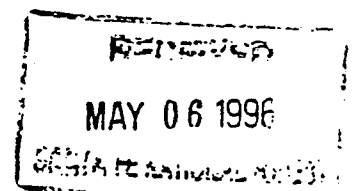
Subject: Dome Fire, Investigation of Fire Shelter Deployment on
April 26, 1996

To: Forest Supervisor, Santa Fe National Forest

Enclosed is my Fire Shelter Deployment Investigation Report for the deployments which occurred on the Dome Fire on April 26, 1996. We determined that 48 firefighters deployed their fire shelters; one of the firefighters, Tony Tanuz, suffered second-degree burns on the back of both of his hands. Another Firefighter, Ron Herrera, reported he also suffered burns during his deployment. None of the other 46 firefighters reported any injuries. Engine 5, a model 20 engine from the Jemez Ranger District, was destroyed by the fire.

The investigation team has five recommendations for improving firefighter safety:

1. Selection of strategy and tactics must be based on projected and observed fire behavior. The extreme fire behavior on this fire shows the need to be conservative in predicting the probability of success for any strategy. The investigation team thinks that extra consideration should be given to assigning a probability of success for a strategy so that probability adequately allows for extreme fire behavior which may be common on fires in the Southwest this year. Assigning too high of a probability of success to a strategy in the Escaped Fire Situation Analysis may encourage the managers of the fire to continue the use of tactics longer than they would if they thought there was a lower expectation of probability of the success of the strategy. With extreme fire behavior, the need to quickly adapt tactics may be critical for the safety of firefighters.
2. The transition from initial attack to extended is a particularly vulnerable time for accidents on fires. Another reminder of the importance to safety of appropriately staffing to provide adequate oversight to the fireline may be appropriate for incident management teams.
3. On large fires it is essential that there be observers who have the ability to monitor overall fire behavior. During the daylight hours we recommend another person should be on each air attack flight. This person's only duties would be to observe fire behavior and discuss the behavior with the firefighters. This observer should be equipped with a radio that will allow him to scan and communicate on all tactical, command, and air-to-ground frequencies in use on the fire.





4. Impending hazards must be clearly communicated on the radio. It is better to clearly broadcast an impending hazard over the radio and accept the increased concern this will cause on the fireline than to risk the importance of the hazard not being clearly communicated to everyone who needs to know about the hazard.

5. Reemphasize to firefighters the importance of scraping a fire shelter deployment site down to bare mineral soil to reduce the risk of the shelter coming in direct contact with flame. Direct flame contact from even light fuels can reduce the protection a shelter is designed to provide.

Personal observations I must make about this investigation are that I was impressed with how well the firefighters who deployed their fire shelters followed their training in shelter deployment, and I was impressed by how Gary Blackwell and his Northern New Mexico Type II Incident Management Team managed this fire. Nothing I observed during this investigation would cause me to even hesitate one second in requesting this team to manage a fire.

I thank you and each of the members of the investigation team for their work and dedication to firefighter safety.

JOHN D. FEHR
Team Leader

Enclosure

cc:
Team Members (w/enclosure)



Caring for the Land and Serving People



FIRE SHELTER DEPLOYMENT INVESTIGATION REPORT

DOME FIRE

Santa Fe National Forest
April 26, 1996



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Team Leader
Cibola National Forest

Team members:

Jim Northup
Chief Ranger, Big Bend National Park
IC, NPS Type 1 All Risk Incident Management Team

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Coconino National Forest
Law Enforcement Officer
FBA and Division Supervisor

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Division Supervisor, IARR

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BIA, Albuquerque Area Office
IARR, Support Dispatcher, Strike Team Leader

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Magdalena Ranger District, Cibola National Forest

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EXECUTIVE SUMMARY

DOME FIRE SHELTER DEPLOYMENT INCIDENT APRIL 30, 1996

This investigation was focused on the events associated with deployment of fire shelters on the Dome Fire. This report should not be considered a review of the management of the Dome Fire. The intent of this investigation was to determine the events involved with the deployment and to recommend actions that may improve safety for wildland firefighters. The Northern New Mexico Type II Incident Management Team was fully cooperative with the investigation.

The Dome Fire started on the afternoon of April 25, 1996, the result of an abandoned campfire on the Santa Fe National Forest. The fire was initially attacked at approximately 1600 hours on the 25th. The fire quickly escaped initial attack and a Type II Incident Management Team was ordered. The team took over management of the fire at 0600 hours on the 26th.

On the afternoon of April 26, 48 firefighters deployed their fire shelters. Tony Tanuz suffered second degree burns across the back of both hands. Ron Herrera suffered less serious burns. One Forest Service Type 6 engine, Engine 5, was totally destroyed. This is one of the largest fire shelter deployment incidents in history. This incident was also significant in that the deployment took place in three separate locations, over a nearly 2 1/2 mile distance, in approximately a 1-hour period. Jemez #1 Crew and Black Mesa Crew deployed their shelters at approximately 1600 hours. Engines 5 and 91, deployed at approximately 1700 hours.

Like all accidents, this incident was the result of numerous factors, rather than one large event. A number of the 10 Standard Firefighting Orders and 18 Watch Out Situations were compromised. However, there are several particularly noteworthy factors which contributed significantly to this event. They include:

1. Overly optimistic suppression objectives, given current fuel conditions and available resources.
2. The accident occurred during the first operational period after transition from an initial attack organization to a large extended attack operation. This has been observed repeatedly as a period in time when there is often a failure to recognize changing conditions and of compromised communications.
3. Failure to use lookouts aggressively to monitor the fire's progress and advise personnel in advance of the fire's movement.
4. Significant failure to maintain effective communications between adjoining forces and critical aerial observers.
5. Failure to effectively adjust tactical operations in light of projected and observed fire behavior.

Once trapped, supervisors and firefighters performed effectively to deploy shelters and save themselves. Personal protective equipment performed as intended.

The Investigative Team's recommendations include:

1. Selection of strategy and tactics must be based on projected and observed fire behavior, not normal conditions for an area. Tactical operations must also be based on currently assigned resources.
2. During transition from initial to extended attack, incoming incident management teams must recognize that this is a period particularly vulnerable to factors which can lead to accidents, and staff appropriately to provide adequate oversight to field operations.

3. On large fires it is critical that observers who have the ability to monitor *overall* fire behavior and communicate with ground forces be in position. On the Dome Fire this could have been performed well by an additional observer in the air attack aircraft with proper radio communications with ground forces.

4. Impending hazards must be clearly communicated. The reluctance to aggressively address compromised safety practices or broadcast bad news on the radio contributed to weakened communications and a clear understanding of the serious nature of the situation.

5. Firefighters need to be reminded to scrape the ground to bare mineral soil before deployment.

DETAILS OF REVIEW

I. Fire Behavior

The fire behavior experienced during this incident was a critical factor contributing to this fire shelter deployment. The fuels present were identified by the fire team fire behavior analyst as NFFL models 10 at the higher elevations and fuel model 9 further down slope with some small stands of pinyon-juniper on south-facing slopes. The fuel loading for both models appeared to be high. The weather experienced was extremely dry for April. The wind experienced during the deployment was higher than the spot forecast acquired at 2230 on April 25, 1996, and used to produce the fire behavior forecast for the day shift on April 26, 1996. The team identified clearly in its shift plan for April 26, the potential for blow up conditions. The lack of fuel moisture was recognized by the fire team and was the driving factor for the extreme fire behavior experienced. The topography in the deployment area is very steep and broken causing some of the erratic features of the fire behavior experience. During the night of April 25, the fire burned mainly ground fuel leaving a heavy dry canopy and large islands of unburned fuels within the planned control lines. Reburning of the remaining canopy was observed. The road into the deployment area (FSR 142) was jumped by a crown fire originating in an unburned island adjacent to that road. Forest System Road 142 was both control line and an escape route for the crews involved in this deployment incident.

The possibility of extreme fire behavior was predicted and communicated. The observed fire behavior was the worst possible scenario predicted.

II. Environmental Factors

The factors present when the fire shelter deployment occurred included heavy smoke that impeded visibility denying lookouts on the ground and in the air and an accurate view of the fire. The steep slopes limited escape routes for all the crews involved in the incident, denying access to safety zones that did not require fire shelter deployment.

III. Incident Management

Most of the personnel involved in the deployment incident had been involved in the initial attack operation. The initial strategy involved an aggressive attack, aimed at keeping the fire out of the canyons and limiting its size. Writing on a marker board in the District Ranger's Office suggests that the initial suppression objective was to "Control 90% of high intensity wildfire at 75 acres or less." This objective was quickly lost. A Type II Incident Management Team was ordered, which began to arrive late on April 25, 1996. They officially took over the fire at 0600 on April 26. Incident Action Plans for the Day Operational Period of April 26 were delivered to the field late on the morning of April 26. The fact that the deployment incident took place during the first operational period for the Typell Team, when transition was essentially occurring, may have been a contributing factor to some confusion on tactics and communication. As is common in the early stages of the operation of an Incident Management Team, the Operations Section Chief was heavily involved in planning and strategy meeting, and did not devote significant time to supervising on-going operations.

An Escaped Fire Situation Analysis was prepared at 2030 on April 25, 1996. Given observed and potential fire behavior for the known fuel conditions, the EFSA assigned an unrealistically optimistic probability of success to the chosen strategy, a continued control strategy. The cover page of the EFSA acknowledged observed spotting distances of from 1/2 to 3/4 mile. It does not appear that the chosen strategy was consistent with this level of fire behavior. An overly optimistic view of the probability of success, given greater than normal fire potential, may have been a contributing factor to assigning resources to Road 142, despite a forecast for shifting winds. Under normal fuel conditions for the area, the strategy and tactics would have been appropriate.

While the Lookout, Communication, Escape Routes, Safety Zones (LCES) process appears to have been applied to the development of the Incident Action Plan for April 26, in fact, LCES was not practiced in the field. Crews did not "Keep one foot in the black" as directed in the Action Plan, nor was the need for lookouts adequately met in actual field operations. The LCES worksheet, used in the planning session for the first operational period called for lookouts to be "posted at all times" and for "commo with air support and adjoining Divisions and crews." These important safety practices were compromised in the field, and contributed to the inability to track the fire's movement and lag time in notifying personnel in advance of the fire.

The fire community continues to need to address the organizational culture of fire. One Division Group Supervisor, having identified that one of the crews under his supervision lacked any radio communications, stated that he thought about pulling the crew off the line until he could get them a working radio, but did not want to be viewed by the Incident Management Team as "a Whiner." This crew was burned over, and received their only warning about the approaching fire from a passing engine foreman. A "Passion for Safety" will only be achieved when positive safety behaviors are supported and encouraged with the culture of fire suppression. The Division Group Supervisors decision to leave this crew on the line without communications was inconsistent with the stated #1 Incident Objective of providing for safety first.

There were significant operational problems with several of the Call When Needed (CWN) helicopters which arrived at the incident. There were problems with several radio systems, one helicopter arrived without a bucket or fuel truck, another without a module. The inability to use air resources effectively in the early stages of the fire contributed to confusion and the inability to properly size up the fire or monitor its progress.

The Type II Incident Management Team expressed frustration over how much longer than expected it took to receive basic suppression resources and additional overhead personnel. Tactical plans were made which could not be successfully implemented due to lack of resources.

In reviewing the management of the deployment incident, the Type II Team should carefully review accepted protocols for handling critical incidents. At least two agency personnel, both injured during the burnover, and one crew, complained bitterly about the lack of proper treatment and follow-up regarding both their physical and emotional welfare.

IV. Control Mechanisms

Span of Control: Influenced.

In general, guidelines for span of control were followed, however, use of of Strike Team Leaders would have facilitated better oversight of assigned resources. In addition, the lack of operable radios required one individual to oversee the operations of two hand crews.

Communications: Significantly influenced.

Communications or the lack thereof played a large role in the incident. Many of these communication concerns are discussed as part of subsequent sections of this report. Two principle concerns focus on the identification of frequencies and the plan (04/26/96) revealed that no air-to-ground frequency had been identified. A condition which might have exacerbated air-to-ground communications difficulties.

Unclear and nondescript communications represents a second concern. Interviews with hand crews and the division supervisor indicated that a request for air support was made while the crew was preparing to deploy. Although a request for air support was made, the request failed to convey the immediacy of the need. The communications lack of intent effect is apparent in the finding that crew requests for air support were superseded by the demands of a spot fire.

Ongoing Evaluations: Significantly contributed.

Crew interviews revealed that fire conditions were rapidly changing. While these observations are imperative to safe firefighting, it is apparent that tactics were not reevaluated in light of the changing fire behavior. This lack of reevaluation might best be characterized by the observation that crews experienced increased spotting that soon exhausted their capabilities. The entrapment occurred soon after this time.

10 Standard Fire Orders: Significantly Contributed.

Standard Order	Followed	Compromised	Did not Follow
1. Fight fire aggressively but provide for safety first.		X	
2. Initiate all actions based on current and expected fire behavior.		X	
3. Recognize current weather conditions and obtain forecasts.	X		
4. Ensure instructions are given and understood.			X
5. Obtain current information on fire status.		X	
6. Remain in communication with crew members, your supervisor, and adjoining forces.		X	
7. Determine safety zones and escape routes.	X		
8. Establish and maintain lookouts at all times.			X
9. Retain control at all times.	X		
10. Stay alert, keep calm, think clearly, act decisively.	X		

1. Fight fire aggressively but provide for safety first.

An aggressive containment strategy was adopted during the initial attack portion of the fire. The escaped fire analysis revealed that early plans called for the containment of the fire within an area defined by road 389 to west, 142 to the south, and 288 to the north. The ship plan directed firefighter to have "one foot in the black."

Actions taken by the firefighters were consistent with an aggressive suppression effort. A slop over located just south of the intersection of road 289 and 142 was quickly contained by constructing handline running

diagonally between the two roads. Moreover, additional spots across road 142 were staffed in an effort to maintain this road as the southern boundary.

Unfortunately, these aggressive efforts were accompanied by compromises to safety. Although these compromises are discussed in greater detail later, three specific compromises are particularly germane to this standard order. All of these compromises center around actions performed (or not performed) at the intersection of roads 289 and 142.

On Friday morning a plan was made to burn-out an island of unburned fuel near the intersection. A lack of resources and the extreme fire behavior, however, prompted the abandonment of this plan. Such inaction did not directly compromise safety until crews moved east of the island along road 142, a dead end road. During a period of increased fire activity, the island burned effectively blocking the road and preventing the egress of firefighters to the west.

A second salient compromise occurred during this period of increased activity. Engine 5 was working with handcrews located along road 142 and when they had used all of their water, proceeded west on the road back to the intersection to take on water. Upon returning to the area, the island was burning and fire was crossing the road. The engine paused in the road and waited for the flame front to pass and then proceeded east into what quickly became an entrapment area.

Finally, a crew charged with containing the slop-over, Jemez Crew #1, found themselves in a position with a safety zone (i.e., a location where fire shelters are not needed to survive the passage of the fire). Statements revealed that crews were aware of the risks inherent with their position and acted to identify a deployment zone. The report does not indicate that the crew attempted to find a more conservative safety zone where shelters would not be needed.

2. Initiate all actions based on current and expected fire behavior.

It is the consensus of the investigation team that firefighters behaved appropriately in response to the current fire behavior. Concern, however, was expressed with respect to their ability to act based upon expected fire conditions. Because the main fire was not visible and few (if any) lookouts were posted, firefighters were unable to anticipate the fire's actions. This inability to anticipate would have greatly reduced the number of viable escape options; a factor that might be reflected in the high number of shelter deployments.

3. Recognize current weather conditions and obtain forecasts.

Evidence collected during the investigation revealed that firefighters demonstrated behavior consistent with maintaining an awareness of current weather conditions. Although spot weather information was reported by fireline crews, it is unclear if forecast information was returned back to the crews. One crew statement indicated that weather information might have been obtained via the local NOAA broadcast.

4. Ensure instructions are given and understood.

This Standard Order and Order 6 played similar roles in this incident. While the majority of firefighters reported frequent communications with the division supervisor, interviews with firefighters revealed that the two engine crews, E-91 and E-5, were unaware of any specific instructions upon arriving in Division C. These engine crews, originally working on Division A, were instructed to proceed to Division C and aid hand crews in the area. Upon entering Division C. However, one and probably both engines failed to contact the division supervisor. Statements indicated that one engine could hear the communications on the division, but no indication was given that contact was made.

It appears that this lack of communication persisted for the entire duration those engines were in the division. Interviews with one crew revealed that aside from the initial instructions to proceed to Division C, neither

engine crew received specific instructions. Moreover, the crews did not seek instructions and no reported effort was made by the division supervisor to contact these crews to proceed east on road 142 toward Dome Lookout was made with the input of the Division C supervisor.

Additional concerns about instructions, particularly those found in the shift plan, were expressed by another crew. The crew statement indicates that they had not received a shift plan or map prior to the shift. Their statement further indicates that they did not receive a map even when it was requested.

5. Obtain current information on fire status.

The investigation revealed that ground firefighters made several attempts to obtain information concerning the status of the fire. Unfortunately, these attempts were generally unproductive. While the division supervisor conveyed information to hand crews, current information concerning the fire's status was unavailable. Heavy smoke, dense vegetation, and the terrain effectively occluded the view of the fire from both ground and air. At the time of this report, it is unclear if anyone knew or could see the main fire.

6. Remain in communication with crew members, your supervisor, and adjoining forces.

As noted earlier, there was no apparent interactive communications between the engine crews and the Division C. supervisor. Further communication problems occurred when the radios for the Black Mesa Crew could not be programmed to the appropriate frequency. In response to the lack of radios Leonard Bird, crew representative from the Santa Domingo, was assigned to the crew.

Additional communication difficulties were reported by individuals working air-attack. The reports indicated that the configuration of the communications system with the aircraft prevented efficient scanning of channels. Ken Bishop, the air attack group supervisor, stated, "if someone on a division calls, air attack can't hear it."

An interview with Duane Archuleta, Division A group supervisor, indicated that Engine 91 was in contact with him in advance of and during the shelter deployments of the engine crews. No indication was given that the supervisor on Division C, Ken Schein, was aware that the engine crews had deployed.

7. Determine safety zones and escape routes.

All of the crews considered their escape routes and safety zones.

8. Establish and maintain lookouts at all times.

One crew indicated that the crew boss served as a lookout. What this individual was watching, however, was unspecified. Aside from this reference, no other indications were given that lookouts were used.

9. Retain control at all times.

All personnel involved in the incident demonstrated control over their actions.

10. Stay alert, keep calm, think clearly, act decisively.

Interviews suggest that crews displayed all of these behaviors during the period prior to the entrapment and deployment.

18 Watchout Situations: Significantly contributed.

The Watchout matrix is provided below. Narrative for those compromised or not followed are provided below. Apparent discrepancies in the manner in which the matrix was completed stem from the fact that some items are not mutually exclusive. Clarifications are provided in the narratives. Finally, it is important to note that at least two of the Watch-Out did not apply to this incident. These Watch-Outs are so indicated in the matrix.

Watch-Out Situation	Followed	Compromised	Did not Follow
1. Fire not scouted or sized up.	X		
2. In country not seen in daylight.	X		
3. Safety zones and escape routes not identified.	X		
4. Unfamiliar with weather and local factors.	X		
5. Uniformed on strategy, tactics, and hazards.	X		
6. Instructions and assignments not clear.			X
7. No communication link with crew members or supervisors.		X	
8. Constructing line without safe anchor point.	X		
9. Building line downhill with fire below.	X		
10. Attempting frontal assault on fire.	X NA		
11. Unburned fuel between you and the fire.		X	
12. Cannot see the main fire, not in contact with someone who can.			X
13. On a hillside where rolling material can ignite fuel below.	X NA		
14. Weather becoming hotter and dryer.	X		
15. Wind increases and/or changes direction.	X		
16. Getting frequent spot fires across line.		X	
17. Terrain and fuels make escape to safety zone.		X	

Watch-Out Situation	Followed	Compromised	Did not Follow
18. Taking a nap near fireline.	X		

6. Instructions and assignments not clear.

See narrative Standard Order 4.

7. No communication link with crew members or supervisor.

See narrative Standard Order 6.

11. Unburned fuel between you and the fire.

See narrative for Standard Order 5.

12. Cannot see main fire, not in contact with someone who can.

See narrative for Standard Order 8.

16. Getting frequent spot fires across line.

This Watch-Out was particularly salient for the two engine crews. The original escape plan identified road 142 east as the escape route and the Dome Lookout as the safety zone. Unfortunately, the road to the lookout and the proximity of saddles along the escape route impeded and ultimately prohibited at least one of the crews from reaching their designated safety zone.

V. Involved Personnel Profiles

The personnel, with the exception of the dozer operator and Air Attack person, involved are employed and trained by the Bureau of Indian Affairs, National Park Service and the USDA Forest Service (FS) government agencies. The hand crews were Native American Southwest Fire Fighting crews sponsored by the Bureau of Indian Affairs, Northern Pueblos Agency, and USDA Forest Service, Santa Fe National Forest. Engine crews were National Park Service, Bandelier National Monument, and USDA Forest Service, Santa Fe National Forest employees. The Archeologist was an employee for the FS. The dozer operator works for PNM Construction and was hired as a contractor for the fire. Air Attack was retired from the U.S. Forest Service and was hired as an AD employee.

Training and Qualifications

Training and qualifications met minimum standards for each person (position) interviewed, with the exception of one individual. Proper training of the shelter deployment techniques and methods was evident in the actions of the crews. Through our interviews, no indication was projected that a person lacked adequate training or qualifications except one engine person.

Operational Period Length and Fatigue

Involved personnel were initial attack forces assigned to the Dome Fire on Thursday, April 25, 1996. Several of the assigned personnel were working their regular duty hours on April 25, 1996, prior to their fire

assignment. AD and contractor employees were hired upon receiving their fire assignments. Most of the interviewees proceeded to work the night of April 25 and into the next morning on Friday, April 26, 1996. Day shift duties were assigned to the initial attack forces for April 26, 1996. On Friday, up to the time period of the deployment(s), the crews and personnel involved were in transition from initial attack to the Type II team.

An estimation of the operational period for the initial attack forces was between 24-35 hours. Initial attack forces were assigned day shift assignment and objectives on Friday, April 26, 1996. Fatigue of the assigned resources was a concern by some of the Division Supervisors. Fatigue and inadequate available resources were main factors in accomplishing a planned burnout task in Division A.

Attitudes

Initial attack of the fire was the main focus of each involved crew doing initial attack. The initial attack attitude of April 26 was to keep the fire out of the canyons. There was no time taken to step back and determine if initial attack was working. The attitude prior to deployment was one of concern and readiness.

Post-shelter deployment attitudes were mixed reactions. Communication of the deployment back to essential people was slow, possibly hindered by the transition to extended attack. Sharing of deployment information to medical personnel and stress relief was slow or non-existent. Communication determining crew location, crew accountability, and crew safety was inconsistent throughout the day shift. This is especially significant prior to enduring the fire blowup time period.

We recommend that in the future there be a process to make sure all victims are provided the required post-trauma counseling.

Leadership

Initial attack forces were transitioning into an extended attack mode, while the Type 2 team was assuming management of the fire. Each Division Supervisor assigned duties to their crews but actual work assignments depended on the existing fire behavior and initial attack activity on a specific location of the fire. A command decision was determined to utilize on-going initial attack forces and available fresh resources for the day shift. Although leadership should have recognized that what they were doing might not be working, when it came time to deploy shelters, their leadership skills enabled their crew members to remain calm and deploy their shelters correctly.

Individual firefighter leadership within the engine and handcrews was adequate and was a positive factor in the deployment not inducing major injuries and/or fatalities. However, higher level leadership factors may have played a negative role in recognizing a lack of communication between the engine crews and the assignments between Divisions A and C. Leadership roles and responsibilities related to compromising the "10 Standard Fire Orders" and "18 Situations that Shout Watch Out" during changing fire conditions leading to deployment may be questionable.

Experience Levels

Experience levels were consistent with the level of each supervisory position. Previous fire experience assisted those individuals lacking any fire experience (Rookies) prior to and during their shelter deployment. Location of the deployment sites were based on the fire experience levels of the supervisory personnel.

VI. Equipment

This portion of the report will emphasize the personal protective equipment that was used by the firefighters.

Availability.

None of the firefighters interviewed during this investigation reported that they did not have the personal protective equipment they needed and were required to have. Tony Tanuz with Engine 5 and Jerome Martinez with Engine 91 reported they lost their gloves during their deployments.

Performance/Failure.

All of the personal protective equipment used by the firefighters appeared to function as it was designed to do. The investigation team did examine the six fire shelters deployed by the firefighters on Engines 5 and 91. Four of the shelters had some areas of discoloration due to heat exposure, and Tony Tanuz' shelter had a 2-foot long tear in the mental fabric on one side. The four shelters with discoloration will be forwarded to the Missoula Technology and Development Center for examination to confirm if the shelters did function within the design standards established for them,.

Clothing and Equipment.

No problems with the personal protective equipment were detected.

Used for Intended Purpose.

At least three of the shelters deployed by the firefighters on Engines 5 and 91 had indications of some direct flame contact. There was grass present in the area where the three firefighters from Engine 5 and Jerome Martinez deployed their shelters. The shelters may have been damaged by the flames from the grass burning. Tony Tanuz reported that grass ignited within his shelter while he was deployed. He stood up to pull the grass out of the ground and threw it away from him. Standing up was a very high risk action during the deployment. The road where the firefighters from Engines 5 and 91 deployed was an appropriate choice for a deployment site. The very low fuel moistures at the site made it clear that it was important to scrape even the sparse grass from the deployment site. The deployment sites for the Black Mesa and Jemez #1 crews had several areas where the crew members had cleared their deployment sites down to mineral soil. Clearing the deployment site to mineral soil is essential with the low fuel moistures that are currently being experienced by the Southwestern Region.

The firefighters from Engine 5 reported that they had sprayed water on their clothes before they entered their fire shelters. This is not a recommended safety practice. The result could be higher humidities inside the shelter and breathing may become more difficult.