North East Area Training-N.E.A.T.
D[illegible] of Natural Resources
E[illegible]ment & Training Center
[illegible] West Somo Avenue
Tomahawk, WI 54487

ATT. # 6

SHIP ISLAND FIRE

Fire Shelter Entrapment Report

A Crew Boss was killed on the Ship Island fire which originated in an inaccessible area in the central part of Idaho. The fire was caused by lightning.

As the fire progressed, a Class I overhead team was assigned. Overall fire strategy was to conduct flanking tactics and crowd the fire to higher elevations. The severe topography and fuel conditions prohibited any other strategy.

In the afternoon, a Crew Boss, a 10-person crew and a Line Scout had been conducting a holding action on the fire as it crept down the north facing slope of Tumble Creek. The objective was to hold the fire on the north slope until burning out operations could be conducted on the next ridge to the north. The holding action was being done with the use of pumps, hose, and water application equipment. Several rockslides had been identified as designated safe areas. A helispot had been cleared on a rocky ridge near the bottom of the upper reaches of the canyon.

At about 1400 hours, the Crew Boss and Line Scout, from their vantage point at the helispot, noticed a spot fire across the creek from the 10-person crew. This spot fire was up-canyon from another organized crew which had just arrived in the canyon. The Crew Boss advised both crews to move to the designated safe areas - rockslides. The Crew Boss and Line Scout gathered the scattered personal gear that had been dumped at the helispot into a pile 17 feet in diameter in the center of the helispot. About 15 to 20 minutes after the discovery of the spot fire, the fire traveled approximately 300 yards and overran the helispot. As the fire approached them, they finished piling the gear and then took refuge in their fire shelters on the up-slope side of the helispot and above the stack of personal gear. Both felt quite sure that the helispot was as safe as the designated safe areas and that the shelters would provide them adequate protection.

As the fire moved quickly around the helispot, it ignited the personal gear. This caused an intense source of heat 12 feet from the Crew Boss, and about 17 feet from the Line Scout. The Line Scout quickly perceived this and moved his shelter three different times in the course of 1-1/2 to 2 hours as he attempted to get away from the burning pile of gear. The Line Scout was able to move his shelter because he was wearing gloves and could handle the very hot shelter edge. The Crew Boss changed his location once, he moved about the length of his body, leaving his hard hat and radios behind. It is believed this occurred near the time of his death.

SHIP ISLAND

The Line Scout found it very difficult to control his shelter in the erratic and strong winds that surrounded him. He also found it very difficult to keep his bearings as he attempted to peek out from under the shelter and find another safe spot. The gear pile was completely consumed. A saw box and pump box also caught fire and burned completely. The following preliminary conclusions can be drawn:

1. Undue reliance was placed on the shelter as protection from the advancing fire.

2. The shelter is designed to reflect heat only. These shelters undoubtedly withstood temperatures above what they were designed for and were in contact with actual flame.

3. Gloves must be required to be in the possession of all fire suppression personnel who carry the fire shelter. It is impossible to hold the edges of the shelter without good leather gloves. We assume the absence of gloves prevented the Crew Boss from moving his shelter as the Line Scout was able to do.

. Fireline personnel must be instructed to keep personal gear dispersed if it is dropped close or adjacent to fire area.

. Fire shelters do work in cases of extreme fire emergency and it is responsible for the survival of the Line Scout.

. The Crew Boss and Line Scout conducted themselves in a very professional and competent manner. Both employees had experienced many fires before. The Line Scout is a Fire Behavior Officer and the Crew Boss had experienced over 300 fires.

. Careful attention to the predicted fire behavior and careful review of the strategy and tactics to be employed was made by the Overhead Team, the Forest Supervisor, and the investigating team. Given the conditions, the holding tactic in the canyon was acceptable, considering the small crew force and the location of designated safe areas.

FROM:
JIM GRANT
NORTHERN TRAINING
MISSOULA, MT.

North East Area Training N.E.A.T.
Dept. of Natural Resources
Equipment & Training Center
518 West Somo Avenue
Tomahawk, WI 54487

U.S. GOVERNMENT PRINTING OFFICE: 1979—[illegible]

U.S. DEPARTMENT OF AGRICULTURE

SPEED-MEMO

PART NUMBER	DATE
1	12-10-79

TO: Art Jukala
MEDC

FROM: Everett Mathiney
R-0- R-4

SUBJECT: 6730 Safety Management
Ship Island Fire

MESSAGE (WRITE CONCISE MESSAGE. SIGN AND FORWARD PARTS 1 AND 2 TO ADDRESSEE. RETAIN PART 3)

Art Attached is a copy of report on the Pattie fatality for your review. Report is still For Official Use Only

See you on the 15th of January.

Have a nice X-mas

SIGNATURE: Everett

REPLY (USE THIS SPACE FOR REPLY. SIGN AND DATE. RETURN PART 2 TO SENDER. RETAIN PART 1)

SIGNATURE	DATE

FORM AD-311(REV. 5-68)

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

R-4

MEDC - Jukala

REPLY TO: 6730 Safety Management Information System

DEC 4 1979

SUBJECT: Fires Safety Management Recommendations

TO: Deputy Regional Foresters and Director, A&FM

The Regional Safety Management Team reviewed the investigation report for the fatality on the Ship Island Fire. Some of the findings, while not directly related to the fatality, indicate a need for action to prevent future incidents. Therefore, the RSM Team appointed a team to develop recommended management actions by January 15, 1980. The members of the team are as follows:

RO-A&FM - Everett Waterbury, Chairman
RO-A&FM - Richard Montague
RO-PM - Kel Bennett
Boise N.F. - Gordon Stevens
Salmon N.F. - Jim Lancaster
MEDC - Art Jukala

The chairman will make all arrangements to convene the team to review the accident investigation report. David Jay, Chief Investigator, will be available as a consultant for the team. Upon completion of the review, a written report of recommendations will be submitted to Claude Elton, Chairman, Regional Safety Management Team.

Claude R. Elton

CLAUDE R. ELTON
Deputy Regional Forester
Administration

cc:
Team Members
Boise N.F.
Salmon N.F.
A - Elton

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

TARGHEE NATIONAL FOREST
St. Anthony, ID 83445

REPLY TO: 6730 Safety Management Information System

November 2, 1979

SUBJECT: Pattee Fatality Report, Ship Island Fire, Salmon National Forest

TO: Regional Forester

FOR OFFICIAL USE ONLY

Enclosed is the final report on the Pattee fatality of 7/26/79, on the Ship Island Fire. The nine findings are the result of an intensive investigation and recorded interviews by the investigation team. In addition, we received excellent assistance from John Dell, fuels management specialist, Aviation and Fire Management, Region 6; and Ernest Amundsen, Development and Testing, Missoula Equipment Development Center.

There are several additional points for your review:

1. The accident brief stated that "Pattee and Camp conducted themselves in a very professional, competent manner". We have removed this statement from the final report. Pattee and Camp may have thought they were acting in a professional and competent manner but, in reality, they violated some very basic rules and that is not professional. The fact they both had considerable fire experience is certainly no justification for their actions. That did not change the fact that they deviated from the designated safety plan and failed to recognize the fuel value of clothing, gear and flammable equipment.

2. Insufficient attention was given to predicted fire behavior by the overhead, i.e.: The Lolo crew and the safety officer's mid-day hike on July 26 into Tumble Creek.

   Specifically I am concerned with the quality and responsible leadership of crew leaders on the ground. They have certain responsibilities about fire behavior and fail-safe approach routes which cannot be ignored.

3. The fire organization and lines of accountability were unclear on July 26, i.e.:

   - No written organization - July 26.
   - Line Scout Camp and Crew Boss Pattee were reporting directly to Fire Boss Elms.
   - No line boss on the fire.

Throughout the interviews, it was apparent that differing views existed about the fire organization and who was accountable for specific actions. When written instructions are not available, key overhead must emphasize organization, strategy, tactics, and who is accountable for each action.

4. The overhead organization (fire boss, fire behavior officer, and plans chief) was inadequate to handle the Ship Island fire campaign beginning on July 24, 1979. Forest Supervisor Hauff added a Class I overhead team to aid with the evaluation of fire strategy.

   Supervisor Hauff and Evaluation Team Fire Boss Dittmer understood their roles very well. Dittmer provided counsel and strategy evaluation to Hauff. Hauff then used this to further evaluate and suggest options to Fire Boss Elms. Fire Boss Elms did not fully understand nor perceive the relationship the same as Hauff and Dittmer. He was concerned various times as to whether he possessed full control and decision-making authority about the tactics on the fire.

   This situation was complicated by the severe, almost impossible, terrain and access problems. This was not overcome with a good communication system. The result was little contact during the week of July 22 between Dittmer and Hauff with Elms. More contact occurred between Fire Behavior Officer Rinehart and Fire Behavior Officer Lee of the evaluation team.

5. The burning out and holding objectives in the Tumble Creek Canyon were not clearly understood and agreed to by all fire overhead, the Class I evaluation team, and Supervisor Hauff. The isolation of the two teams and the difficult communications contributed to a misunderstanding as to the strategy in Tumble Creek.

   Supervisor Hauff stated that his primary strategy was to hold the fire in Tumble Creek. Fire Boss Elms stated his was to delay the fire until the burnout was complete on the ridge. In addition, Division Boss Belnap, Fire Behavior Officer Rinehart, and Line Scout Camp, Crew Boss Pattee, Smokejumper Foreman Yensen all may have had differing conclusions about how the holding action and the burning out would occur.

   We would conclude that if the Tumble Creek holding action was to hold the fire and not allow it to proceed up the south facing slope, maybe more preparation for a water line, increased attention to safe areas, better agreement and understanding by the crew about the risks involved, should have occurred.

Other Comments by Feb. 8
R-4

CONFIDENTIAL

6730 Safety Management Information System

JAN 23 1980

Fire Management Safety Recommendations

Deputy Regional Forester, Administration

Enclosed are the recommended action items for the Pattee fatality on the Ship Island Fire, July 26, 1979, as compiled by the assigned team. All team members were in attendance at the meeting held January 15, 1980.

No attempt was made to change or alter the recommendations of the investigative team or the Regional Safety Team's review or addendum; but rather to deal with action items as they were identified in the investigation report and the Chief Investigator's November 2, 1979, letter. The action items will follow as closely as possible the findings format as described in the final report.

The recommended action items are as follows:

Human Factors	Who	Date
1. Place strong emphasis in all fire training that the Ten Standard Fire Fighting Orders are not to be deviated from or broken. Instill the attitude that you do not have the prerogative to deviate from the orders.	Montague	5/1/80
2. Incorporate in all fire related training that the fire situations that shout "watch out" are understood and followed.	Montague	5/1/80
Mechanical Factors		
1. Revise and update training film and fire training plans on fire shelter use, incorporating and placing emphasis on:	NFDC	7/1/80
a. Shelter does not burn readily.		
b. Shelter is the "last resort" use only if all other routes are not available.		

6. The reliance on helicopter supply of hot meals delayed the Lolo crew's departure to Tumble Creek from helispot H-2 until 1000 hours on July 26. The Lolo crew's assistance in Tumble Creek two hours earlier may have provided a completely different outcome.

   Once again, this points to the difficulties we experience and tolerate in getting our crews early on the line.

7. The Salmon National Forest aggressively tried to implement the current suppression policy on the Ship Island Fire. Their escape fire analysis reflects an attempt to balance values, resource loss, risk, with costs. However, in so doing, the support forces and the overhead team were hampered by inadequate intelligence, inadequate safety information, inadequate record keeping, inadequate communications, and inadequate logistical support. We could conclude that all participants knew of the limited suppression effort. It may follow, then that specific suppression action in an area such as Tumble Creek or Parrot Creek did not have specific hour and production objectives.

   The line forces themselves may have done less than what we would have accomplished under the old policy by knowing that if we lose it here or are not successful there, we will be able to pick the fire up elsewhere with little retribution.

We must reflect on the fact that this fatality was not unusual or different from many of the others we have experienced. Some of the common denominators of fire behavior on other fires where tragedy has occurred were present here. These are outlined in Carl C. Wilson's pamphlet published December 1978 entitled "Some Common Denominators of Fire Behavior on Tragedy and Near-Miss Forest Fires". Somehow, we must bridge that chasm to fatality-free fire campaigns.

DAVID M. JAY
Forest Supervisor

Enclosures (6)

	Who	Date
Mechanical Factors (con't)		
c. Use of gloves is mandatory.		
d. Where to place yourself and shelter in relation to heat transfer convection and available fuels.		
e. Recognize that personal gear and equipment is flammable and a source of heat.		
f. Value of property is insignificant in relation to human injury.		
g. Remain in shelter, do not run, panic, or move from one location to another.		
h. How to breath properly within shelter when it becomes hot and uncomfortable.		
2. Include in the hands-on use training of shelter, whenever possible, the "hot fire" experience. Can be accomplished by using large, controlled open fires or other heat sources that would duplicate a running, uncontrolled wildfire.	MEDC	7/1/80
3. Modify the current shelters by:	MEDC	10/1/80
a. Changing or revamping hold-down straps to where they are sufficient to keep shelter from blowing up or away during periods of high winds created by the fire.		
b. Opening of shelter from case can be accomplished with ease and while the hands are gloved.		
c. Install a heat-resistant see-through window, so user can see what is going on outside the shelter without raising the sides.		
4. Establish proper shelter inspection intervals, including how many times it can be opened and closed and still be useable.	MEDC	10/1/80
5. Develop a reporting procedure by using a incident summary sheet for each time a fire shelter is used on a fire. Include in this procedure all "close calls" while engaged in fire suppression. This form would match the system presently being utilized in reporting aircraft incidents.	[illegible]	7/1/80

Management Factors	Who	Date
1. Define "modified suppression action fires" to where the Forest Supervisor and Fire Boss down to the fireman can understand and know how to apply the proper action.	Montague	5/1/80
2. Lines of authority need to be understood and followed on all fires, using the direction "each fire will have only one fire boss." Support and reinforce manual direction.	Montague	6/1/80
3. Develop a checklist for managers for fire situations that shout "watch out." Should be similar to present fire situations that shout "watch out" for fireman.	RO Team	7/1/80
4. Emphasize the following points during the training of all overhead and fire teams:	Montague/ Forest Supervisors	6/1/80
a. Follow standard fire organization as outlined in the manual.		
b. Organize to give proper control and direction to both personnel and equipment. Make sure that overhead decisions on strategy are known and understood by all.	Montague/ Forest Supervisors	6/1/80
c. Whenever possible, make instructions in writing. Needs to be legible and understood.		
5. Upgrade Region "Mob Plan" to include a fire team complement for a long fire team, short fire team, and a FMA fire team.	Waterbury	6/1/80
6. Enforce the length of shift rule as explained in FSH 5131.11. All firefighters and overhead should understand this policy and follow it.	Montague	5/1/80
7. Incorporate heat stress symptoms and precautions in all basic firefighting training. Distribute publication developed by [illegible] dealing with heat stress to all units.	Waterbury	6/1/80
8. Research has suggested that excessive buildup of CO in firefighters can effect both mental capacity and energy level. Determine if this is detrimental and, if so, what needs to be done to eleviate the problem.	WO	8/1/80

Management Factors (con't)	Who	Date
9. Determine what constitutes a proper rest or sleeping area and what duration of sleep is necessary for firemen so they can think and work safely. Incorporate these standards into guidelines for managers and into the Fireline Notebook.	MEDC	10/1/80
10. Logistical problems in the feeding of crews continues to be a problem, which, in turn, delays crews arriving on lines or reporting to work. Alternatives should be established, such as, insuring that rations are available in case food cannot be flown in and that the proper number of people are assigned to camps to match cooking facilities. Need to study proposal of 24 hours on and 24 hours off shift. This would solve numerous problems, not only with feeding, but also with proper rest, exceeding 12 hour shift limit, etc.	WO	11/1/80

Everett L. Waterbury

EVERETT L. WATERBURY
Chairman
Management Action Team

cc:
E. Waterbury, AMFM
Kel Bennett, PNI
Gordon Stevens, Boise N.F.
Jim Lancaster, Salmon N.F.
Art Jukala, MEDC

INFORMATION FOR OWCP:

Mr. Camp Was released from the Steele Memorial Hospital, Friday, July 27, 1979. He returned to his regular duty station, Council, Idaho. Monday, July 30, he became ill and is presently hospitalized in the Community Hospital in Council, Idaho. Evidently, he had a pain in his chest and was coughing a great deal. Tests are being run at this time.

Joan Burningham 7/30/79

JOAN BURNINGHAM
Personnel Clerk
Salmon National Forest, Salmon, ID

FIRE SHELTER PICTURES

K.P.

Head at Left,

Tag at head end
Hole front center cut out
cut at head end
Straps cut
Alum. very brittle at foot end - most likely
Pieces fell off or torn after K.P. removed

HEAD AT RIGHT

Foil at foot end all three - most likely
delamination had occurred but Aluminum
brittle so tears could be due to all the
handling. Shelter arrived roughly folded
so was not handled carefully.

PIN HOLES: Head end of J.C.'s shelter - holes
hot air - radiant heat could come through.

Later - Lolo IR Said K.P. shelter all
intact when they found and removed K.P. He
was outside shelter and they say it looked
like he had crawled out, breathed hot air, then died

Plenty time get to Lolo rockslide

Camp moved, Pattee didn't move - Elms

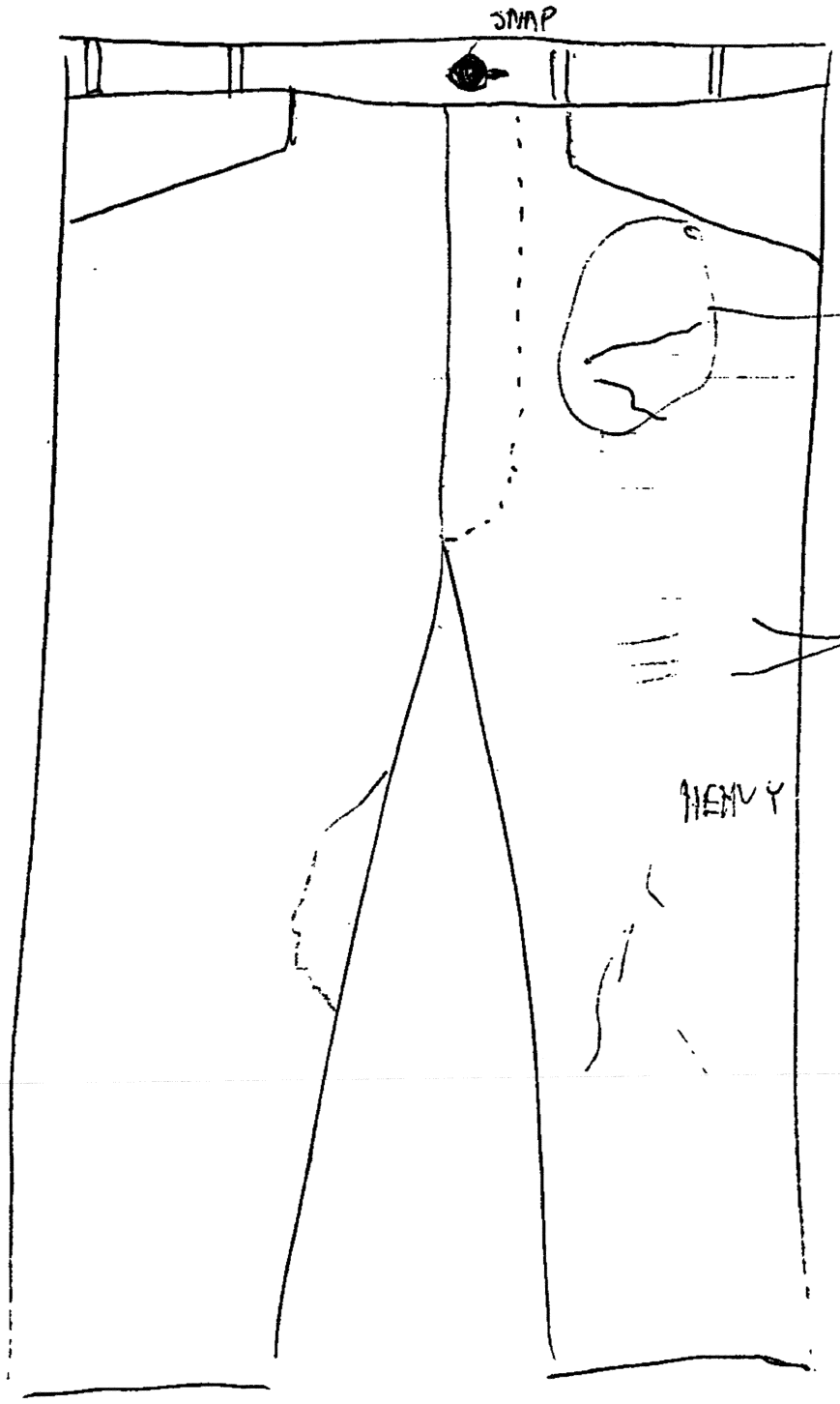
Elms has good account of fire action - observed sequence

polyimide film as window - integral

KYLE PATTEE
NOMEX 450
STAGED OFF

TROUSERS, MENS ... [illegible]
POLYAMIDE TYPE FF/FRP-2
GS-085-3276[illegible]
JUNE 1974 KENT UNIFORMS
SIZE 32

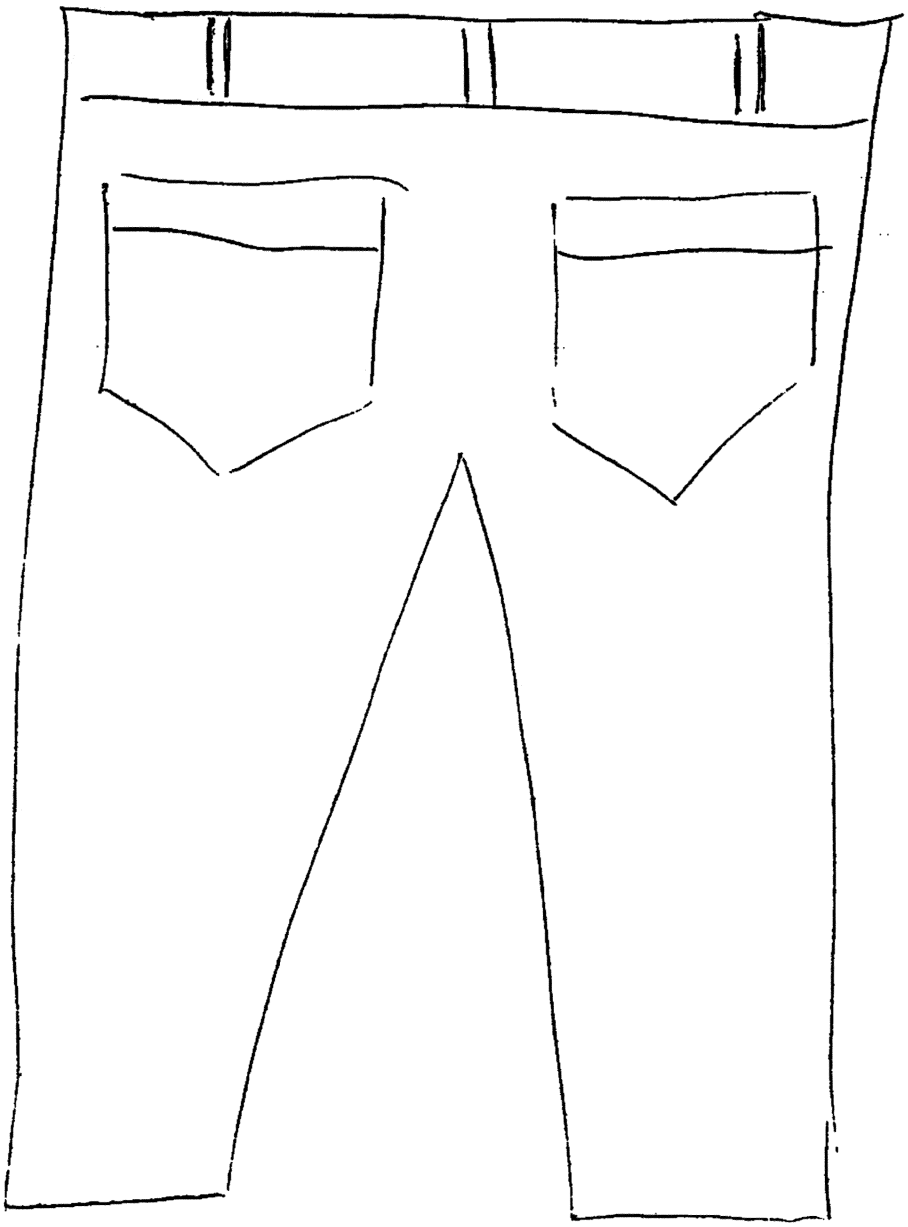
8-1-19



TIGHT ??

= HEAT SET
— DYE COLOR
~ CREASES
= HOLES, BURN

PAIEE



KYLE PATTEE

SHIRT, MAW'S

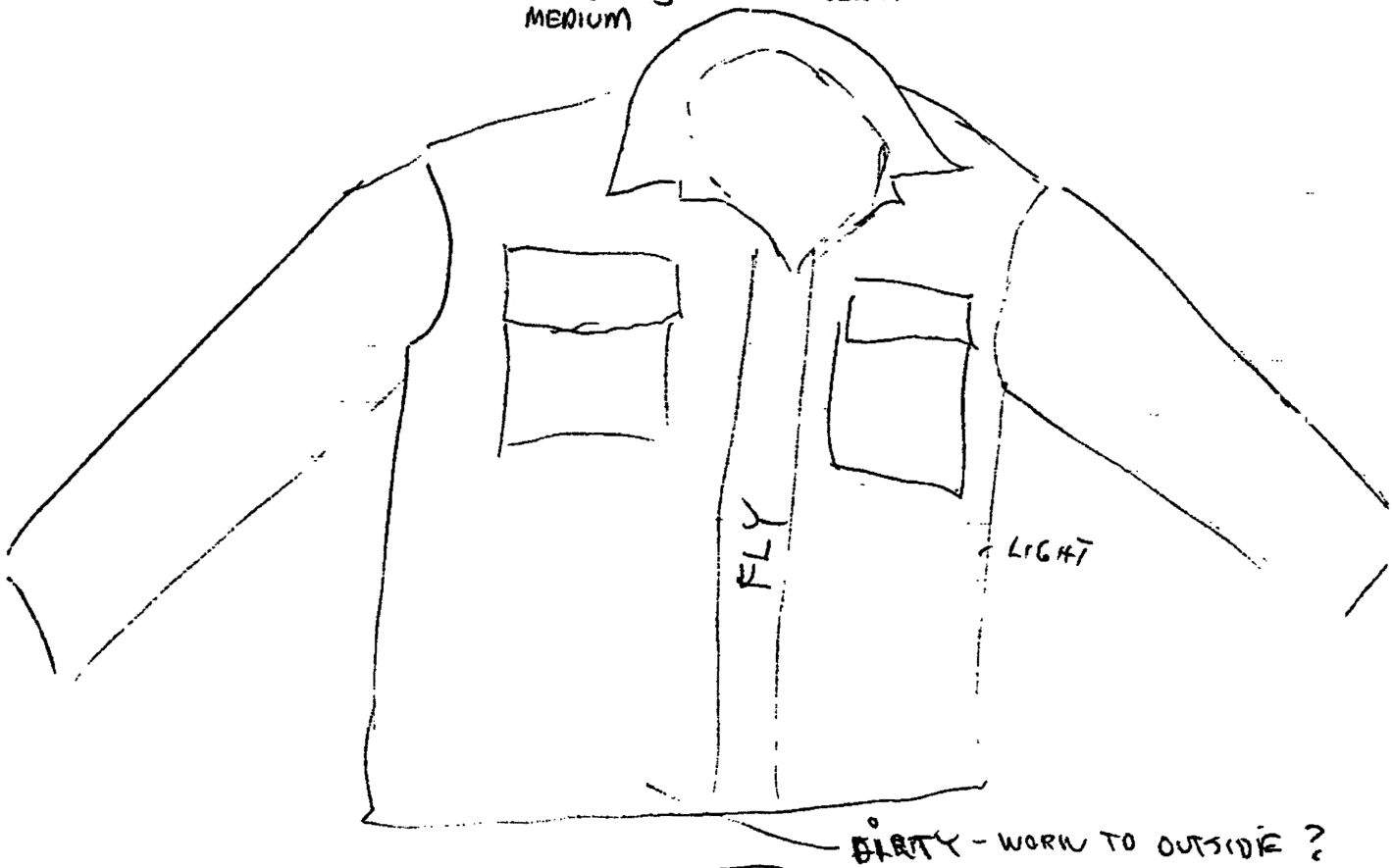
8-1-19

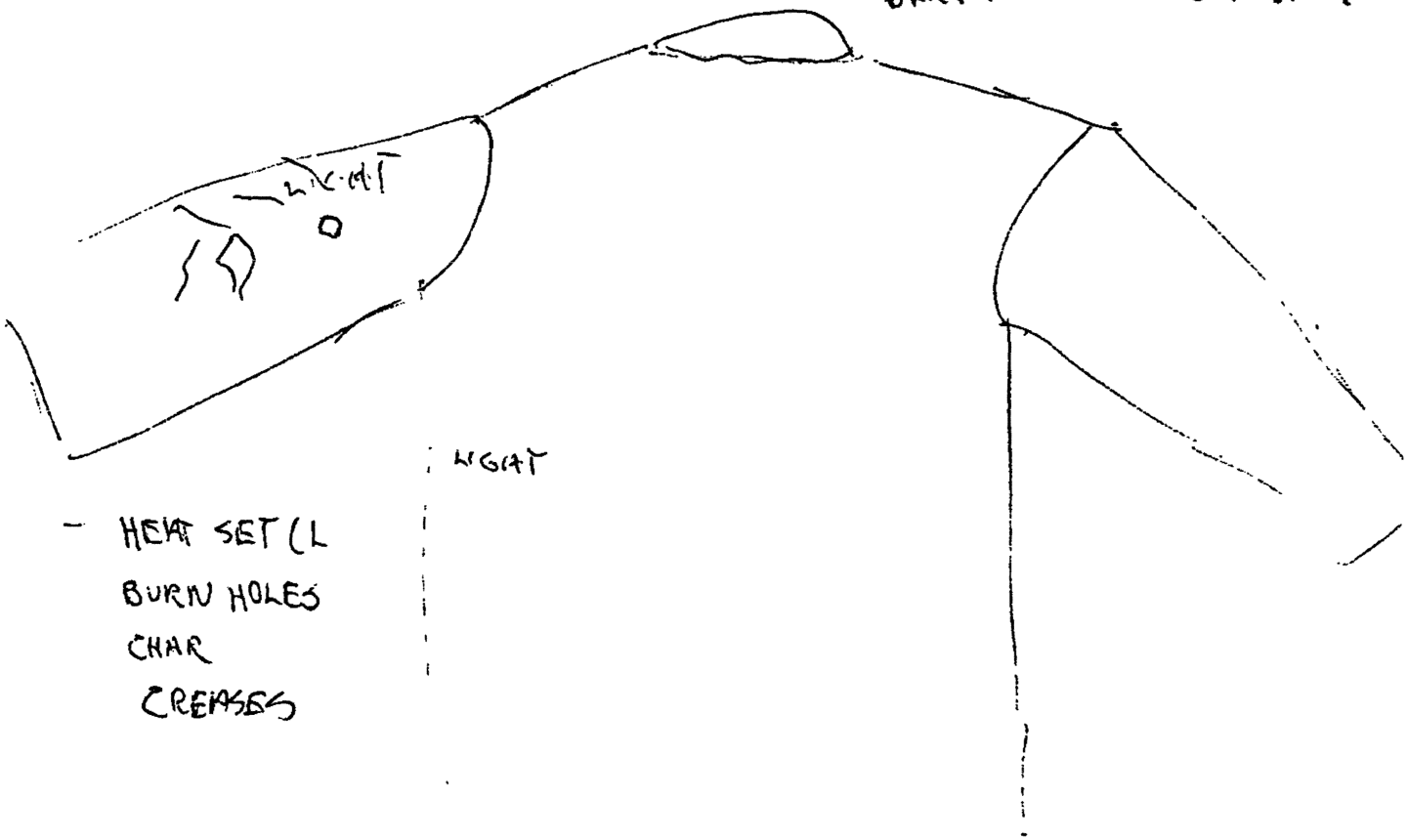
FIRE RESISTANT (POLYAMIDE)

65-085-31331 (OQ)

15½ x 33 GLENBERRY

MEDIUM



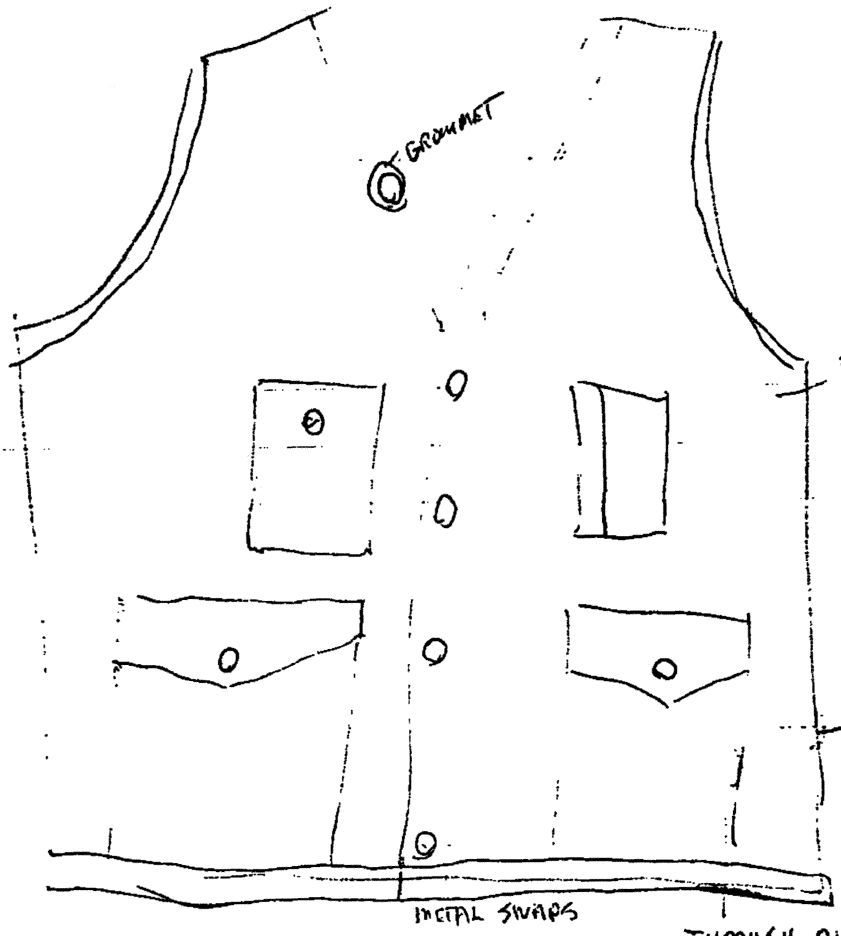


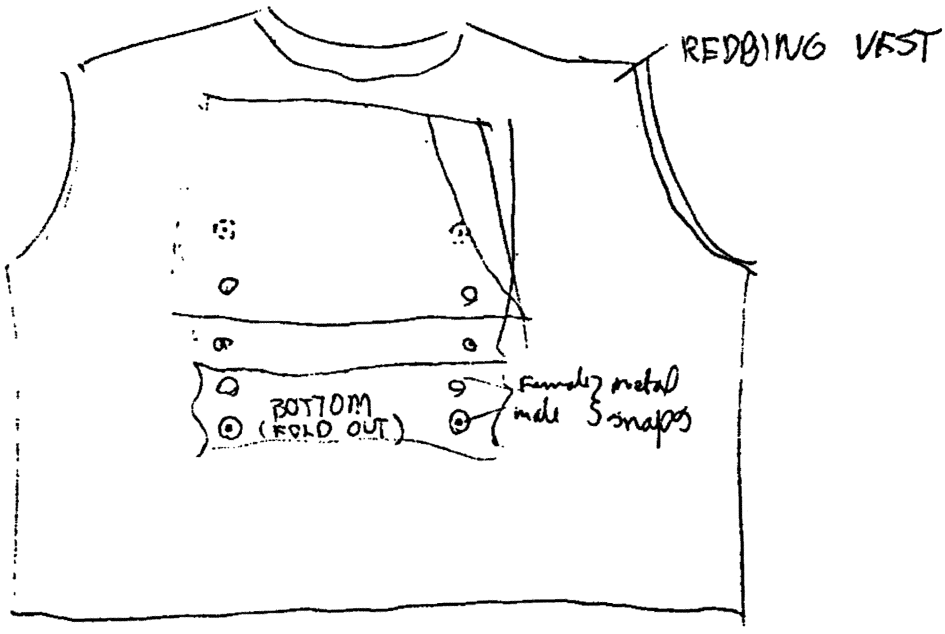
- HEAT SET (L
- BURN HOLES
- CHAR
- CREASES

KYLE PATEL

VEST : REDDING ?
~ CALIFORNIA ~

8-1-14



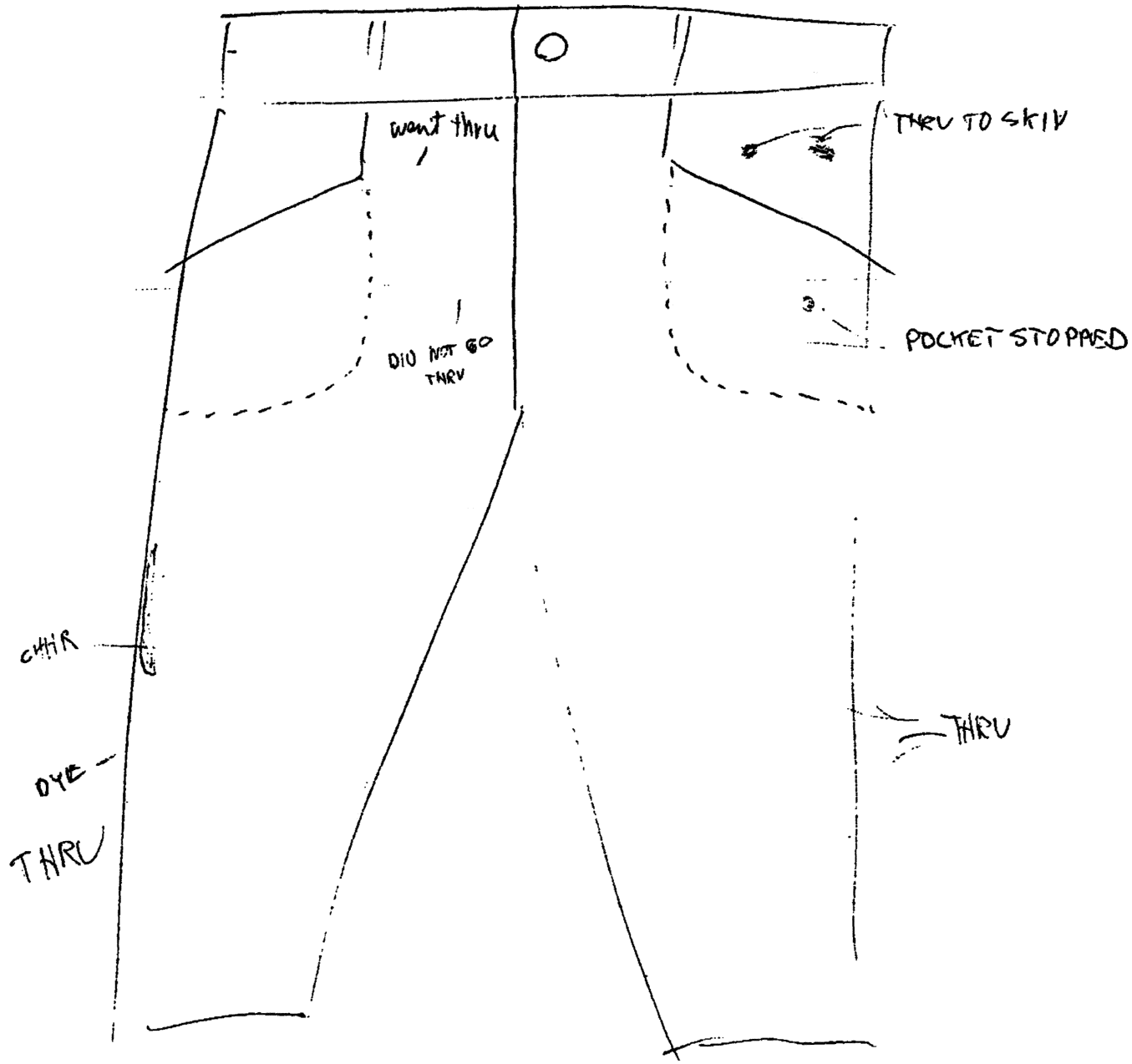


JIM CRAMER

8-1-74

TROUSERS, MEN'S FIRE-RESISTANT
POLYAMIDE TYPE FF/FRPs
GS-08S- 31944
GLENN BERRY 1975 SIZE 34

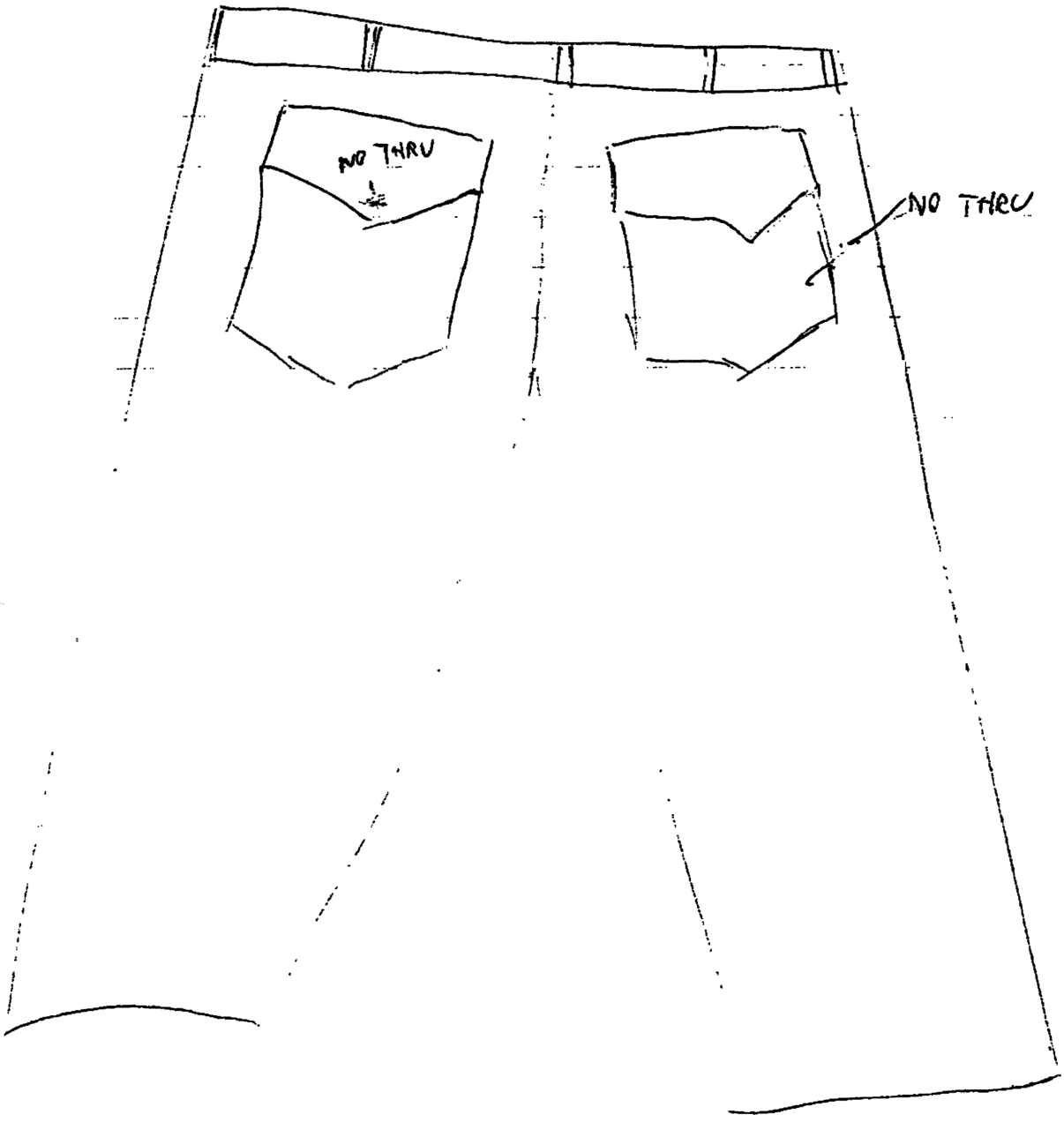
NOMEX 450



NO HEAT SET

JIM-CAMP

8-1-19



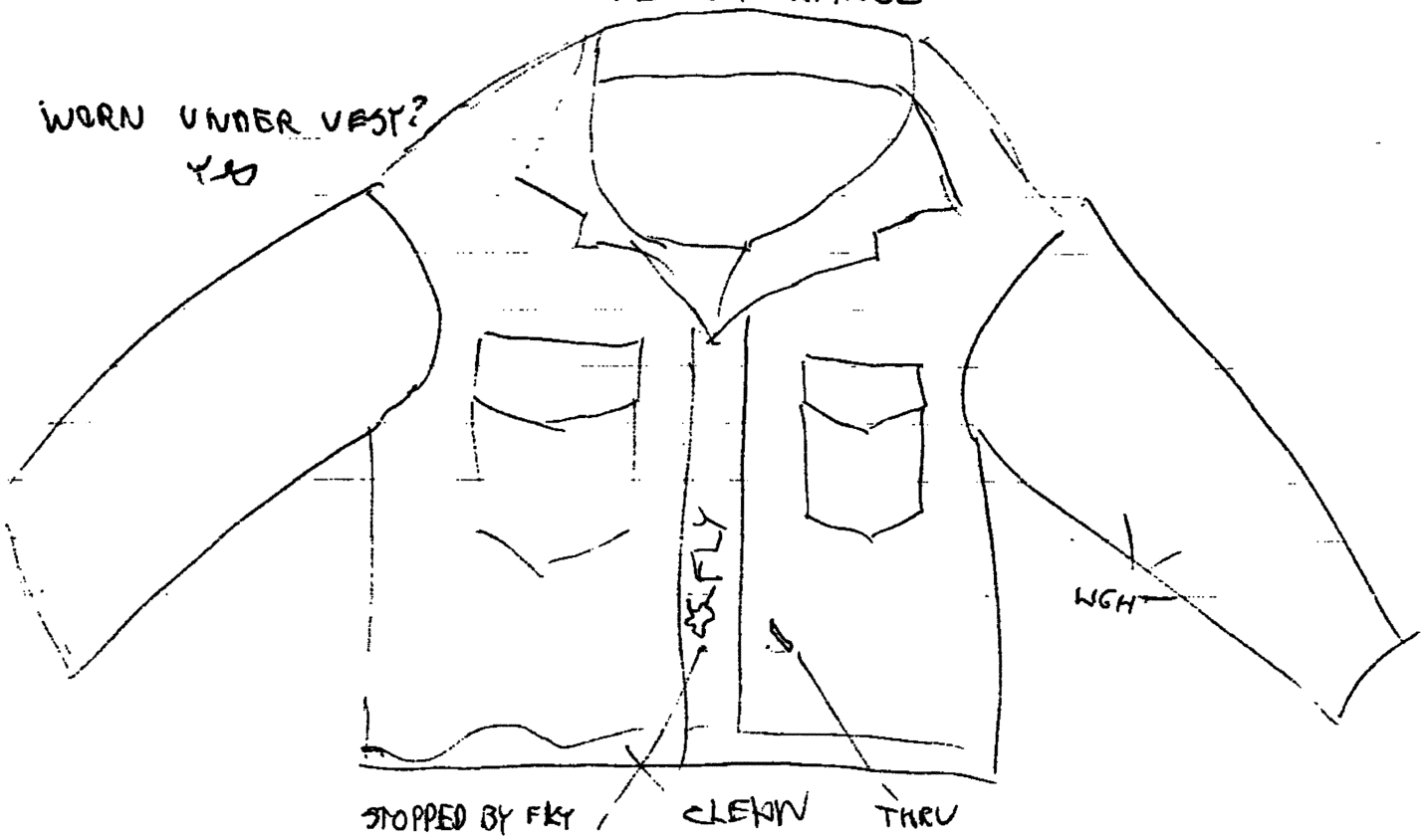
JIM CAMP

SHIRT, MAN'S

8-1-70

FIRE RETARDANT (COTTON)
65-085-2934H
T.S. LANHFORD & SONS INC
16½ x 34 LARGE

WORN UNDER VEST?
YES



BACK SHIRT OK

0-F-14
0840

NOTES VIA ERNIE
SNIP ISLAND
THURS AUG 2

(1) Crew member in rockslide ask to try to save gear 24-25 packs

(2) set up shelters
(3) Piled gear 16' x 3 ft high
(4) Fire reach them - talk to Bob, Tarzee, Elmo started to get very hot
(5) camp caught glimpse and knew gear was on fire
(6) camp moved to position (2); Peter moves
(7) Peter says Sam on fire, camp says to move, and camp says he can't, can't beat out fire, starts to scream then silent (est 45 min)

Jim Camp, 43

(8) Saw box ignites, moves to (3)
(9) Pump box ignites, moves to (4) til 2hours
(10) Lolo crew boss comes to him, verifies that Patee is dead.
(11) Torque crew comes over.

When Camp moved first, may be Pattee had moved so he's not in front of

TEAM: Measure 12 ft to Patee and 20 to Camp
29 so distances in question

Kyle Pattie lives FMO & Instructor 6 mph wind
Ashton, ID crew boss trainer, somewhat fuels expert

RECOMMEND
1. Better training film - show turbulance
2. Strap hold down analyses
3. Sod cloth" strip around bottom
4. Lolo crew - had to control men once in shelter - Two men close to burning log wouldn't move
5. Does bolder job than people may realize sure protects so well
6. Got sparks & cinders under shelter
7. Lolo? crew says fire past.
8 Camp closer to natural fuels and his shelter looks good. Pattee close to pile and destroyed hence dominant heat on his shelter was from gas

1

8-2-14
1230

JACKSON

LOLO I R : speculate patter stood up to move then breathed in air

Also didn't think deployed shelters until fire got there.

BY FRIDAY

Temperatures —

FOREMAN MIKE CYRUS

Lolo Crew ~~Exotic~~ - crew ?

1. Control
2. Claustrophobia
3. Heat effects ?
4. Problems.

3337 Robertson

Lolo Dispatch
Dale Thompson
342

MIKE Cyrus ~~Sr.~~.

½ sq yd = 8" x 18" strip

= $.80 (material = .65, labor = 0.15)

≈ 302 more

ROUGH DRAFT
EWAmundsen/kb - 8/3/79

Lee:

As a result of my review of the use of the fire shelter by Kyle Pattee and Jim Camp on the Ship Island Fire, I am proposing two actions. If you approve I would like these proposals submitted to Dave Jay and to Aviation and Fire Management for consideration.

The shelter was used by the two men in conditions far more extreme than those for which it was designed. The time of exposure, type of heat source, and I believe the heat to which both men were subjected were far from the conditions expected when the shelter was designed. Yet, given these conditions, I believe Camp would not have survived without the shelter.

Even though the conditions under which the shelters were used by Pattee and Camp were not typical, I believe we have an invaluable source of information in Camp. I would like to include Camp in both proposals which are:

1. Training - There seemed to be a need for more emphatic training in the use of the shelter. Whatever the medium used I would like to cover:

   A. Ability to communicate and the effectiveness of communication while under the shelter.

   B. How to get into the shelter.

   C. Psycological areas like claustrophobia, the feeling of being alone under impending disaster, etc.

D. Handling of the shelter under strong and variable winds.

E. Areas and conditions suitable for use of the shelter.

F. Reaction to extreme localized heating or burning.

G. Breathing.

H. Emphasize limitations of shelter and the concept that normal precautions should be followed first and the shelter used as a last ditch effort.

2. Review of Concept and Design

A. Hold down features.

B. Use of auxiliary equipment like gloves.

C. Incorporation of heat sensors.

D. Material update and methods of QC (glue)

E. Pull tab problems.

Ernie

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Equipment Development Center
Fort Missoula, Missoula, Montana 59801

REPLY TO: 5100 Fire Management

AUG 7 1979

SUBJECT: Investigation of Fire Shelter on Ship Island Fire

TO: Dave Jay, Supervsior
Targhee National Forest
420 N. Bridge St.
St. Anthony, Idaho 83445

Enclosed are Amundsen's opinions and recommendations as a result of his investigation of the use of the fire shelter by Jim Camp and Kyle Pattee on the Ship Island Fire.

LEE I. NORTHCUTT
Director

Enclosure

cc: BIFC (Anderson)

EWAmundsen/kb:8/6/79

5/DR

August 3, 1979

Lee Northcutt:

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   D. Handling of the shelter under strong and variable winds.

   E. Areas and conditions suitable for use of the shelter.

   F. Reaction to extreme localized heating or burning.

   G. Breathing.

   H. Occupant's vision.

   I. Emphasize limitations of shelter and the concept that normal precautions should be followed first and the shelter used as a last ditch effort.

2. Review of Concept and Design

   A. Hold down features.

   B. Use of auxiliary equipment like gloves.

   C. Incorporation of heat sensors.

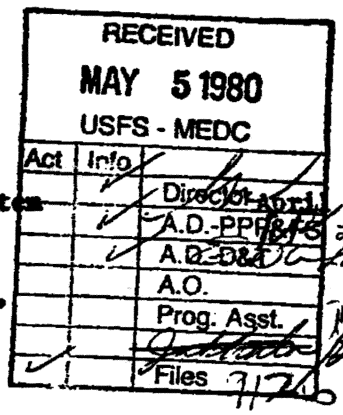
   D. Material update and methods of QC (glue).

   E. Pull tab problems.

   F. Shelf life and use life inspection procedures.

Ernie Amundsen

NO



6730 Safety Management Information System April 30, 1980

Fire Management Safety Recommendations,
Ship Island Fire 7/26/79

Deputy Chief, NFS

As requested in Personnel Management's March 17 letter, we have reviewed the Washington Office action items recommended by Region 4 as a result of the Ship Island Fire investigation. Our comments on each recommendation follow.

MECHANICAL FACTORS

1. ("Revise and update training film and fire training plans on shelter use...") We concur with the recommendation to provide instructional emphasis on the listed points a. through h.

   The NWCG Basic Firefighter course (S-130), which is mandatory for all firefighters, is under revision. The shelter training in it will be strengthened, and the recommended material included. Target date for issuance of the revised course material is 2/1/81.

   Preparation of a new training film may be appropriate after completion of any design modifications by MEDC. In the interim, at least, the present film, with additional supplementary instructional emphasis, is adequate to meet training needs. This will be evaluated by A&FM by 12/31/80.

2. ("Include in the hands-on training...'hot fire' experience.") We do not agree that this is a practical-- or necessary-- normal training component. Duplication of conditions under which a shelter should be used would be impossible or imprudent in most cases; providing an experience under lesser fire conditions would be questionable or even counter productive.

3. ("Modify the current shelters by: a. Changing...holddown straps...") We agree with the need for this. Target date for recommendations from MEDC is 9/30/80.
   ("...b. Opening of shelter from case...while hands are gloved.) MEDC indicates further study of the need for this vs the problems it would create in design and packaging need study. Target date for joint A&FM and MEDC recommendations is 9/30/80.

("...c. Research the possibility of a see through device..." We do not agree that this would be a desirable or necessary feature, even if there were no technical barriers to its addition to the shelter.

MANAGEMENT FACTORS

3. (Investigate potential detrimental effects of CO buildup in firefighters) A&FM will explore previous studies by MEDC with Personnel Management and develop recommended course of action by 8/1/80.

4. (Determine rest needs of firemen) MEDC has completed preliminary literature review, and is preparing a project proposal which will be considered in their proposed 1981 ED&T program review.

EARL W. KEEGAN,

GARY E. CARGILL
Director of Aviation
and Fire Management

DChase:wde

cc: MEDC
WO, Eng.
PM
BIFC, Norm Anderson

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Equipment Development Center
Fort Missoula, Missoula, Montana 59801

REPLY TO: 5100 Fire Management

AUG 7 1979

SUBJECT: Investigation of Fire Shelter on Ship Island Fire

TO: Dave Jay, Supervsior
Targhee National Forest
420 N. Bridge St.
St. Anthony, Idaho 83445

Enclosed are Amundsen's opinions and recommendations as a result of his investigation of the use of the fire shelter by Jim Camp and Kyle Pattee on the Ship Island Fire.

LEE I. NORTHCUTT
Director

Enclosure

cc: BIFC (Anderson)

EWAmundsen/kb:8/6/79

5/OK

August 3, 1979

Lee Northcutt:

As a result of my review of the use of the fire shelter by Kyle Pattee and Jim Camp on the Ship Island Fire, I am proposing two actions. If you approve I would like these proposals submitted to Dave Jay and to Aviation and Fire Management for consideration.

The shelter was used by the two men in conditions far more extreme than those for which it was designed. The time of exposure, type of heat source, and I believe the heat to which both men were subjected were far from the conditions expected when the shelter was designed. Yet, given these conditions, I believe Camp would not have survived without the shelter.

Even though the conditions under which the shelters were used by Pattee and Camp were not typical, I believe we have an invaluable source of information in Camp. I would like to include Camp in both proposals which are:

1. Training - There seemed to be a need for more emphatic training in the use of the shelter. Whatever the medium used I would like to cover:

   A. Ability to communicate and the effectiveness of communication while under the shelter.

   B. How to get into the shelter.

   C. Psycological areas like claustrophobia, the feeling of being alone under impending disaster, etc.

   D. Handling of the shelter under strong and variable winds.

   E. Areas and conditions suitable for use of the shelter.

   F. Reaction to extreme localized heating or burning.

   G. Breathing.

   H. Occupant's vision.

   I. Emphasize limitations of shelter and the concept that normal precautions should be followed first and the shelter used as a last ditch effort.

2. Review of Concept and Design

   A. Hold down features.

   B. Use of auxiliary equipment like gloves.

   C. Incorporation of heat sensors.

   D. Material update and methods of QC (glue).

   E. Pull tab problems.

   F. Shelf life and use life inspection procedures.

Ernie Amundsen

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
K-1

REPLY TO: 6730 Safety and Health Information System August 30, 1979

SUBJECT: Ship Island Fire Fatality

TO: Forest Supervisors; Staff Directors; S&PF, N&MR Specialists; Director, MEDC; and Civil Rights Director

The enclosed accident brief describes the fatality which occurred on the Ship Island Fire, Region 4, on July 26, 1979. A complete report is being prepared by the WO and will be distributed when received.

Robert E Quade

ROBERT E. QUADE
Assistant Director
Personnel Management

Enclosure

cc: Ranger Districts
AFD

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SEP 5 1979
USFS - MEDC

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Jim Lancaster

ACCIDENT BRIEF

July 31, 1979
Kyle Pattee Fatality

On Thursday, July 26, 1979, Kyle L. Pattee, fire management officer on the Ashton Ranger District, Targhee National Forest, was killed on the Ship Island Fire, Salmon National Forest.

The Ship Island Fire originated in the Middle Fork Canyon of the Salmon River in an area not accessible to initial attack. As the fire progressed, a Class I overhead team was assigned. Overall fire strategy was to conduct flanking tactics and crowd the fire to higher elevations. The severe topography and fuel conditions prohibited any other strategy.

On the afternoon of July 26, Kyle Pattee, crew leader; 10 men of the Targhee organized crew; and Jim Camp, line scout, had been conducting a holding action on the fire as it crept down the north facing slope of Tumble Creek. The objective was to hold the fire on the north slope until burning out operations could be conducted on the next ridge to the north. The holding action was being done with the use of pumps, hose, and water application equipment. Several rockslides had been identified as designated safe areas. A helispot had been cleared on a rock promontory near the bottom of the upper reaches of the canyon.

At about 1400 hours Pattee and Camp, from their vantage point at the helispot, noticed a spot fire across the creek from the Targhee Crew. This spot fire was up-canyon from the Lolo National Forest organized crew which had just arrived in the canyon. Pattee advised both crews to move to the designated safe areas - rockslides. Pattee and Camp gathered the scattered personal gear that had been dumped at the helispot into a pile 17 feet in diameter in the center of the rock helispot. About 15 to 20 minutes after the discovery of the spot fire, the fire traveled approximately 300 yards and overran the helispot. As the fire approached them, Pattee and Camp finished piling the gear and then took refuge in their fire shelters on the up-slope side of the helispot and above the stack of personal gear. Both felt quite sure that the helispot was as safe as the designated safe areas and that the shelters would provide them adequate protection.

As the fire moved quickly around the rock helispot, it ignited the personal gear. This caused an intense source of heat 12 feet from Pattee, and about 17 feet from Camp. Camp quickly perceived this and moved his shelter 3 different times in the course of 1½ to 2 hours as he attempted to get away from the burning pile of gear. Camp was able to move his shelter because he was wearing gloves and could handle the very hot shelter edge. Pattee changed his location once, he moved about the length of his body, leaving his hard hat and radios behind. We believe this occurred near the time of his death.

Camp found it very difficult to control his shelter in the erratic and strong winds that surrounded him. He also found it very difficult to keep his bearings as he attempted to peek out from under the shelter and find another safe spot. The gear pile was completely consumed. A saw box and pump box also caught fire and burned completely. The following preliminary conclusions can be drawn:

1. Undue reliance was placed on the shelter as protection from the advancing fire.

2. The shelter is designed to reflect heat only. These shelters undoubtedly withstood temperatures above what they were designed for and were in contact with actual flame.

3. Gloves must be required to be in the possession of all fire suppression personnel who carry the fire shelter. It is impossible to hold the edges of the shelter without good leather gloves. We assume the absence of gloves prevented Pattee from moving his shelter as Camp was able to do

4. Fire line personnel must be instructed to keep personal gear dispersed if it is dropped close or adjacent to fire area.

5. Fire shelters do work in cases of extreme fire emergency and it is responsible for the survival of Jim Camp.

6. Pattee and Camp conducted themselves in a very professional and competent manner. Both employees had experienced many fires before. Camp is a fire behavior officer and Pattee had experienced over 300 fires.

7. Careful attention to the predicted fire behavior and careful review of the strategy and tactics to be employed was made by the Overhead Team, the Forest Supervisor, and the investigating team. Given the conditions, the holding tactic in the canyon was acceptable, considering the small crew force and the location of designated safe areas.

DAVID M. JAY
Chief Investigator