

Wildland Training (STEN) for Structural Firefighters G-330



Student Workbook
OCTOBER 2008



CERTIFICATION STATEMENT

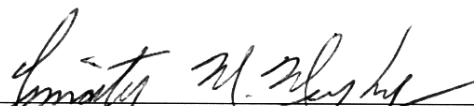
on behalf of the

NATIONAL WILDFIRE COORDINATING GROUP

The following training material attains the standards prescribed for courses developed under the interagency curriculum established and coordinated by the National Wildfire Coordinating Group. The instruction is certified for interagency use and is known as:

Wildland Training (STEN) For Structural Firefighters, G-330
Certified at Level III

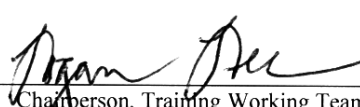
This product is part of an established NWCG curriculum. This course does not meet the requirements of the NWCG COURSE DEVELOPMENT AND FORMAT STANDARDS – Sixth Edition, 2003 but it has been through a professional evaluation process.



Member NWCG and Training Working Team Liaison

Date

10/15/08



Chairperson, Training Working Team

Date

10/15/08

Wildland Training (STEN) for Structural Firefighters, G-330

Student Workbook October 2008

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PREFACE

Wildland Training (STEN) for Structural Firefighters, G-330, is identified training in the National Wildfire Coordinating Group (NWCG) wildland and prescribed fire curriculum. This course was developed from the *Skills Crosswalk* in cooperation with the United States Fire Administration (USFA) and other parties, and funded by the USFA.

All work was completed with the coordination and assistance of personnel from the following organizations:

United States Fire Administration

International Association of Fire Chiefs

National Fire Protection Association

State Fire Training Directors

NWCG Training Working Team

National Association of State Foresters

The NWCG appreciates the efforts of these personnel and all who have contributed to the development of this training product.

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Wildland Training (STEN) for Structural Firefighters, G-330

Unit 0 – Introduction

OBJECTIVES:

During this unit the instructor will:

1. Introduce the instructors and students.
2. Explain the position of the Task Force/Strike Team Leader.
3. Introduce the course and course materials.
4. Present the course objectives.
5. Explain the evaluation process.
6. Describe the wildland training for structural firefighter's gap courses.

I. INTRODUCTIONS

II. ADMINISTRATIVE CONCERNS

III. TASK FORCE/STRIKE TEAM LEADER POSITION INTRODUCTION

A. Explanation of Task Force/Strike Team Leader Position (TFLD/STL)

In the Incident Command System, the Strike Team Leader is the overhead position responsible for a “specified combination of the same kind and type of resources” (crews, engines, dozers, or tractor plows).

The Task Force Leader is responsible for “any combination of single resources assembled for a tactical need.”

Although this course emphasizes wildland firefighting, this position functions within the Incident Command System for all incidents (floods, earthquakes, or any other incidents).

B. Training Requirements for the NWCG Position

Refer to the current PMS 310-1:

- Fire Operations in the Wildland Urban Interface, S-215
- Crew Boss (Single Resource), S-230
- Task Force/Strike Team Leader, S-330
- Intermediate Wildland Fire Behavior, S-290 (STL), and Introduction to Fire Behavior Calculations, S-390 (TFLD).

Additional training that supports development of knowledge and skills are Intermediate ICS, I-300, and Fireline Leadership, L-380.

C. Position Requirements

IV. COURSE OVERVIEW

The purpose of this course is to train experienced lieutenants, captains, or chief officers who meet NFPA 1021 for Fire Officer 1 (or equivalency) in making the tactical decisions required to safely manage personnel on a wildland fire.

This course is composed of units from NWCG training that address “gaps” in skills that were identified in the Skills Crosswalk.

A. Course Objectives

- Demonstrate the ability to apply the risk management process found in the Incident Response Pocket Guide to various incidents.
- Demonstrate the ability to apply appropriate tactics in various incident situations with various resources organized into strike teams or task forces.
- Describe elements of structure protection from wildland fire exposure.

B. Course Agenda

- Unit 1 – Tactical Engagement
- Unit 2 – Structure Triage
- Unit 3 – Support Resources: Hand crews, Aircraft, and Heavy Equipment
- Unit 4 – Firing Operations

C. Instructional Methods

- Facilitation/short lecture with PowerPoint slides
- Discussions
- Exercises/scenarios
- Review questions

D. Measuring Student Performance

- There is a final exam for this course.
- Students must achieve 70 percent or higher to obtain certificates for successfully completing the course.
- Students are expected to complete the NWCG position task book for Strike Team/Task Force Leaders, PMS 311-14.

E. Course Evaluation Forms

V. REFERENCE MATERIALS

A. Incident Response Pocket Guide (IRPG)

The IRPG contains information and checklists which are standard operating procedures to be followed in this course.

B. Fireline Handbook (FHB)

The FHB contains information and procedures that supports overall incident management to be followed in this course.

VI. WHERE DOES THIS COURSE FIT IN THE WILDLAND TRAINING FOR STRUCTURAL FIREFIGHTERS GAP CURRICULUM?

A. Wildfire Training (ENGB) for Structural Firefighters, G-130

This course is designed to provide basic wildland firefighting skills to structural firefighters who meet NFPA 1001 for Firefighter Type 1 or equivalency.

The successful completion of the final exam for this course allows the structural firefighter to apply to the appropriate AHJ for NWCG certification as Firefighter Type 2.

B. Wildfire Training (FFT1) for Structural Firefighters, G-131

This course is designed to provide advanced wildland firefighting skills to structural firefighters who meet NFPA 1001 for Firefighter Type 2 or equivalency.

Completion of the Task Book for NWCG Firefighter 1 allows the structural firefighter to apply to the appropriate AHJ for that credential.

C. Wildfire Training (ENGB) for Structural Firefighters, G-231

This course is designed to provide wildland firefighting skills to structural firefighter drivers, operators, engineers or company officers who meet NFPA 1021 for Fire Officer 1 or equivalency.

Completion of the Task Book for NWCG Single Resource Boss (Engine) allows the structural firefighter to apply to the appropriate AHJ for that credential.

D. Wildfire Training (STEN) for Structural Firefighters, G-330

This course is designed to provide wildland firefighting skills to experienced lieutenants, captains, or chief officers who meet NFPA 1021 for Fire Officer 1 or equivalency.

Completion of the position task book for NWCG Strike Team Leader allows the structural firefighter to apply to the appropriate AHJ for that credential.

Each gap course builds upon the previous course. Successful completion of each course qualifies the learner to take the next course.

VII. REVIEW PRE-COURSE QUIZ

Wildland Training (STEN) for Structural Firefighters, G-330

Unit 1 – Tactical Engagement

OBJECTIVES:

Upon completion of this unit, students will be able to:

1. Demonstrate the ability to receive and provide an operational briefing.
2. Demonstrate the ability to manage assigned resources utilizing the Incident Response Pocket Guide Risk Management Process in the exercises.
3. List the factors required to establish and maintain communications with adjoining forces, your supervisor, and assigned resources.
4. Demonstrate the use of field reference guides during tactical decision making exercises.
5. Demonstrate the ability to modify the tactical plan.
6. Demonstrate the ability to lead an after action review (AAR).
7. List the responsibilities to complete at the end of engagement.

I. BRIEFINGS

Although the secondary elements of the Briefing Checklist may not apply to each briefing, the following primary elements should be addressed:

A. Core Briefing Elements

1. Situation

Discuss information specific to the incident.

- On a wildland fire – fuel, weather, and topography.
- On a tanker truck rollover – spilling toxic chemicals into a stream.

2. Mission/Execution

Emphasize commander's intent, the specific tactical assignment, contingency plan, etc.

3. Communication

What types of communications are available and appropriate (tactical, command, air to ground frequencies).

4. Service/Support

What kind and type resources and leaders are you working next to?

What resources are available for order?

What aviation resources are assigned or available?

What logistical support is required to accomplish commander's intent with resources assigned?

5. Risk Management

Identify the tools and guides available to help with mitigation of the following topics.

- Wildland Urban Interface (WUI)
- Downhill line construction
- Air operations
- General safety
- Line construction standards
- Risk refusal
- Firing
- Mixed resources

B. Operational Briefings

There are three types of initial operational briefings in which the TFLD/STL will participate.

1. Operational period briefing

- Obtain IAPs.
- Ensure single resource bosses are present so that information missed by one person will be picked up by another.
- Incident objectives and strategies identified.
- Section chiefs provide information for the operational period.
- Updates and corrections to IAP information are provided.

MARRE UPDATE #1: Refer to the narration on pages 1.13 – 1.14 of your Student Workbook.

2. Division breakout briefing

- Roll call
- Travel routes
- Drop points
- Communication
- Tactical assignments
- Special instructions
- Safety
- Identify adjoining resources
- Contingency plans

What additional information should be given or asked for at the division breakout briefing?

MARRE UPDATE #2: Refer to the IAP on pages 1.15 – 1.28 in your Student Workbook. Locate the following on the exercise map:

- Drop point 16/Figueroa Mountain
- Catway Road
- Road 8N03
- Davey Brown Campground
- Willow Spring Canyon
- Manzana Creek Drainage

The instructor will act as Division D supervisor and deliver a briefing (be sure to take notes).

EXERCISE: In groups, discuss what information you are missing for a tactical engagement briefing.

MARRE UPDATE #3: Update your IAP map with fire spread location with each video or map update slide. What additional SA do you have? Based on SA, what concerns do you have?

MARRE UPDATE #4: What additional direction and SA do you have?

3. Tactical engagement briefing
 - a. Methods to improve communication:
 - Utilize the chain of command.
 - Meet with adjoining resources.
 - Check accuracy of communication plan.
 - Follow the communication plan in the IAP.
 - b. Identify potential problems:
 - Radio limitations (line of sight for direct radio frequencies).
 - Too much chatter on assigned frequency.
 - Barriers (language, fatigue, experience).

EXERCISE: Deliver an engagement briefing. Ensure the following topics are addressed using the IRPG format:

- **Situation**
How has your actual assignment changed from the assignment given in the incident action plan?
- **Mission/Execution**
Describe how you will deploy your task force to complete the assignment.
- **Communications**
Are communications adequate? (Face to face and radio.) The TAC frequency for Division E in the IAP is different from that in the COM plan received on the previous day. How will this affect operations on your division? Whom should you contact to confirm the change?
- **Service/Support**
Coordinate with adjacent resources. Adequate supplies to conduct burnout.
- **Risk Management**
Describe your escape routes and safety zones. Who is functioning as a lookout and what information do you give to the lookout(s)? Identify trigger points.

MARRE UPDATE #5: How does this new information affect the TFLD/STL decision making process?

EXERCISE: Discuss what additional SA you have acquired. Review the RMP, identify new risks and the consequences of the new risks, and answer the following questions:

- How would you describe the fire environment at this time?
- What are your thoughts about your new assignment?
- Describe how you will deploy your task force to complete your new assignment.

MARRE UPDATE #6: Response to spot fire 1.

EXERCISE:

- What is your reaction to the new spot fire and request for assistance from the engine captain?

- What do you tell the Division D supervisor?

MARRE UPDATE #7: Response to spot fire 2 and escape routes/safety zones.

EXERCISE:

- Was the afternoon wind shift predicted?

- How would you describe the fire environment at this time?

- Describe how you prepared for this change in fire behavior.

II. DEMONSTRATE THE ABILITY TO LEAD AN AFTER ACTION REVIEW (AAR)

The After Action Review is a debriefing format designed to get people to talk. An AAR focuses on the successes and failures of the individual and the team.

A. What was planned?

Review the primary objectives and expected action plan.

B. What actually happened?

Review the day's actions:

- Identify and discuss effective and non-effective performance.
- Identify barriers that were encountered and how they were handled.
- Discuss all actions that were not standard operating procedure, or those that presented safety problems.
- Identify lessons learned and best practices to apply in future situations.

AAR as soon as possible after the action has occurred to capture the emotion of the actions.

C. Why did it happen?

Discuss the reasons for ineffective or unsafe performance.
Concentrate on WHAT, not WHO, is right.

D. What can we do next time?

Determine lessons learned and how to apply them in the future.

EXERCISE: Demonstrate an AAR on the Marre scenario using the AAR format in the IRPG.

III. DEBRIEFING

A. Resources to Communicate with:

- Assigned resources
- Supervisor
- Incoming/replacement resources
- Adjacent resources

B. Items to Cover in Debriefing Session:

- Effectiveness of strategies and tactics
- Accomplished goals/incident objectives
- Lessons to learn
- Safety concerns

C. Mobilize to Camp

Facilitate safe and appropriate mobilization back to camp.

- Make sure assigned resources are in good mental/physical condition to travel safely.
- Ensure equipment/vehicles are in condition to travel back to camp (fuel, damage issues?).
- Reevaluate travel guidelines (headlights on, travel together, communications).
- Abide by safety rules and regulations (seat belts, appropriate speed, etc.).

MARRE UPDATE #8: Night resources arrive; it is 1930 hours. Your task force has been relieved. Your options are:

- Return to camp with your task force.
- Stay and brief the incoming resources.

What do you do and why?

Whom do you communicate with?

What other considerations do you have?

D. Documentation

Documentation in the Unit Log is essential to track events through the operational period.

It provides narrative information on what actually occurred that day for all incident resources. It is reviewed by the Planning Section for details on incident status.

The ICS 214 is included in the final fire package, providing documentation for possible litigation or investigation needs, and provides material for developing training products.

Include only facts, not opinions. Document:

- Significant events
- Safety concerns
- Human resource issues
- Include names, places, times, actions
- Lessons learned (tactical trigger points, Watchouts, weather factors affecting fire behavior)

MARRE UPDATE OPERATIONAL BRIEFING

Time is 0600. You have just finished attending the operational briefing for the Marre Fire and you are assigned to Division D. Attending the briefing with you were two crew bosses and a dozer boss assigned to your task force.

During the division introduction, the Division Supervisor assigned to your Division, F. Bueller, did not respond after his name was called several times. An unassigned Division Supervisor will be assigned after the Operational Briefing.

The Operation Section Chief stated that the night resources had good success constructing line in Branch I.

The day shift assignment for Branch I is to complete line construction tying in to division breaks. The Operations Section Chief encouraged divisions to switch to direct tactics when possible.

Safety Officer is pleased with the efforts by the line resources and wants to continue the outstanding safety record.

During the briefing, the day resources were told that several crews had exceeded the 16 hour duty day and justifications are required. Supervisors must ensure that no shifts exceed 16 hours.

The Incident Meteorologist predicted afternoon temperatures to reach highs of 88-95 degrees on lower slopes and 75-85 degrees on higher peaks and ridges.

Relative humidity may drop to 16-25 percent at lower elevations and 22-28 percent at higher elevations.

Morning winds are expected to be northeast to east at 6-14 mph and shift to southeast in the afternoon. Slope winds will follow normal diurnal patterns.

The Fire Behavior Analyst said that the fire behavior will be similar to the previous day.

The fuel moisture will continue to drop and unburned fuels will have the potential for rapid fire spread.

The inversion is predicted to lift at 1200 hours. Areas above 2500 feet will be less influenced by the inversion and have the potential to be active during the entire shift.

East winds are predicted on Branch I, which may contribute to rapid fire spread. The potential for spotting is higher than on previous days.

MARRE INCIDENT



9/30/XX
Day Operational Period

INCIDENT OBJECTIVES	1. Incident Name MARRE	2. Date 09/30/XX	3. Time 2100
4. Operational Period 09/30/XX Day Operational Period 0600 to 1800			
5. General Control Objectives for the Incident (include alternatives) <ol style="list-style-type: none"> 1. Provide for firefighter and public safety by implementing the Risk Management Process and ICS 215A. 2. Protect structures by implementing the Structure Protection Plan. 3. Protect the riparian zones in Lion Canyon, Cachuma, Sisquoc, Manzana and Davy Brown creeks. 4. Protect timber, especially plantations on the north perimeter. 5. Maintain visual quality to the extent possible along scenic highway 154. 6. Provide regular updates to the media and public on fire activities. 			
6. Weather Forecast for Period See attached weather forecast.			
7. General Safety Message Drive with headlights on at all times. Carry and drink plenty of fluids, especially water! Avoid any unnecessary felling. Watch out for rattlers, bees and poison oak. Apply and update risk management practices throughout the shift.			
8. Attachments (mark if attached)			
<input checked="" type="checkbox"/> Organization List - ICS 203	<input checked="" type="checkbox"/> Medical Plan - ICS 206	<input checked="" type="checkbox"/> Fire Behavior Forecast	
<input checked="" type="checkbox"/> Div. Assignment Lists - ICS 204	<input checked="" type="checkbox"/> Incident Map	<input checked="" type="checkbox"/> Fire Weather Forecast	
<input checked="" type="checkbox"/> Communications Plan - ICS 205	<input checked="" type="checkbox"/> Traffic Plan	<input checked="" type="checkbox"/> Air Operations Summary	
9. Prepared by (Planning Section Chief) Dennis Cooper	10. Approved by (Incident Commander) Bob Geribaldi		

DIVISION ASSIGNMENT LIST		1. Branch I	2. Division/Group C				
3. Incident Name MARRE		4. Operational Period DAY Date: 09/30/XX Time: 0600-1800					
5. Operations Personnel							
Operations Chief	S. Vail	Division/Group Supervisor	F. Baugher				
Branch Director	M. Harkness	Air Attack Supervisor No.	R. Johnson				
6. Resources Assigned this Period							
Strike Team/Task Force/Resource Designator	Leader	Number Persons	Trans. Needed	Drop Off PT./Time	Pick Up PT./Time		
Smoking Eagles	Patterson	21	N	DP-17/0700	DP-17/1700		
Scorpions #1	A. Setzer	18	N	DP-17/0700	DP-17/1700		
Scorpions #2	M. Lopez	20	N	DP-17/0700	DP-17/1700		
BDF Eng 42	Taylor	6	N	DP-17/0700	DP-17/1700		
BDG Eng 56	Smith	5	N	DP-17/0700	DP-17/1700		
ANF Eng 52	J. Payne	5	N	DP-17/0700	DP-17/1700		
ANF Eng 16	Bingham	5	N	DP-17/0700	DP-17/1700		
ANG Eng 15	Giao	5	N	DP-17/0700	DP-17/1700		
ST OC-31	M. Johnson	20	N	DP-17/0700	DP-17/1700		
WT Avila #6			N	DP-17/0700	DP-17/1700		
DIVS (T)	E. Chico	1		DP-17/0700	DP-17/1700		
STLE	A. Johnson	1		DP-17/0700	DP-17/1700		
STLE (T)	Lacey	1		DP-17/0700	DP-17/1700		
7. Control Operations Mop up and patrol 300 feet inside fireline. Utilize backpack pumps. SOFR Johnny Law							
8. Special Instructions Pick up backpack pumps. Protect heritage resources, follow wilderness policies, protect T&E species. Be advised of sensitive archeological sites and protect cabins.							
9. Division/Group Communication Summary							
Function	Frequency	System	Channel	Function	Frequency	System	Channel
Command	170.975	King NFC	5	Logistics	414.650	NFC	4
Tactical Div/Group	168.200	King	2	Air to Ground	170.000	King	13
Prepared by (Resource Unit Leader) B. Lee		Approved by (Planning Section Chief) W. Riker		Date 09/30/XX		Time 0412	

DIVISION ASSIGNMENT LIST		1. Branch I	2. Division/Group D				
3. Incident Name MARRE		4. Operational Period DAY Date: 09/30/XX Time: 0600-1800					
5. Operations Personnel							
Operations Chief	S.Vail	Division/Group Supervisor	F. Buheller				
Branch Director	M. Harkness	Air Attack Supervisor No.	R. Johnson				
6. Resources Assigned this Period							
Strike Team/Task Force/Resource Designator	Leader	Number Persons	Trans. Needed	Drop Off PT./Time	Pick Up PT./Time		
Dalton IHC	Carado	18	N	DP-16/0700	DP-16/1700		
Vista Grade IHC	McCre	20	N	DP-16/0700	DP-16/1700		
Black Eagle #4	P. Roche	20	N	DP-16/0700	DP-16/1700		
Black Eagles #2	D. Garcia	21	N	DP-16/0700	DP-16/1700		
Scorpions #4	G. Attwood	19	N	DP-16/0700	DP-16/1700		
Scorpions #5	Carothers	19	N	DP-16/0700	DP-16/1700		
ENG ST 3660C	Sablan	16	N	DP-16/0700	DP-16/1700		
San Carlos # 113	S. Satter	18	N	DP-16/0700	DP-16/1700		
San Carlos #114	B. Baylish	18	N	DP-16/0700	DP-16/1700		
ST 1566C	Estrada	16	N	DP-16/0700	DP-16/1700		
WT 3	E. Sanaval	1	N	DP-16/0700	DP-16/1700		
Dozer Ames	Ames	1		DP-16/0700	DP-16/1700		
Dozer Bow Valley		2		DP-16/0700	DP-16/1700		
SOF2	L. Templin	1	Unk	DP-16/0700	DP-16/1700		
TFLD	M. Student	1	Unk	DP-16/0700	DP-16/1700		
7. Control Operations DOZB D. Hagen, SOF2(T) T. Frances, Fallers: J.Boyer; A. Taylor; J. Cornell; L. Austin; E. Rivas Complete line construction, hold and improve line. Fall all hazard trees. NEED FALLING BOSS FROM TYPE 1 CREW.							
8. Special Instructions Protect heritage resources, follow wilderness policies, protect T&E species. Be advised of sensitive archeological sites and protect cabins.							
9. Division/Group Communication Summary							
Function	Frequency	System	Channel	Function	Frequency	System	Channel
Command	170.975	King NFC	5 5	Logistics	414.650	King NFC	4
Tactical Div/Group	168.200	King NFC	2 2	Air to Ground	170.00	King NFC	13
Prepared by (Resource Unit Leader) B. Lee		Approved by (Planning Section Chief) W. Riker		Date 09/30/XX		Time 0330	

DIVISION ASSIGNMENT LIST		1. Branch I	2. Division/Group E				
3. Incident Name MARRE		4. Operational Period DAY Date: 09/30/XX Time: 0600-1800					
5. Operations Personnel							
Operations Chief	S. Vall	Division/Group Supervisor	J. Leach				
Branch Director	M. Harkness	Air Attack Supervisor No.	R. Johnson				
6. Resources Assigned this Period							
Strike Team/Task Force/Resource Designator	Leader	Number Persons	Trans. Needed	Drop Off PT./Time	Pick Up PT./Time		
Zig Zag IHC	W. Anderson	20					
Horseshoe IHC	Barratt	17					
Helena IHC	Edwards	20					
Lolo IHC	S. Karkanen	20					
Fresno #1	Nolan	18					
Red Hawks	Forester	20					
OC-24	Bloom	20	N				
FSR #33	Gondor	20	N				
SOF2	Linelauger	1					
DIVS (T)	J. Clem	1					
Fire Behavior Spec.	J. Perkins	1					
7. Control Operations Continue line construction toward Division D. Shift length will not exceed 16 hours without IC approval today. Follow wilderness policies.							
8. Special Instructions Protect heritage resources, follow wilderness policies, protect T&E species. Be advised of sensitive archeological sites and protect cabins.							
9. Division/Group Communication Summary							
Function	Frequency	System	Channel	Function	Frequency	System	Channel
Command	170.975	King NIFC	5	Logistics	414.650	King NIFC	4
Tactical Div/Group	168.200	King NIFC	2	Air to Ground	170.000	King NIFC	13
Prepared by (Resource Unit Leader) B. Lee	Approved by (Planning Section Chief) W. Riker			Date 9/30/XX	Time 0330		

FIRE WEATHER FORECAST

FORECAST NO: 11

NAME OF FIRE: Marre

FOR: 0600-1800 Day

UNIT: Fresno Weather

SHIFT DATE: Sept. 30, 20XX

TIME AND DATE: Sept 29, 20XX

SIGNED: Larry Greis

FORECAST ISSUED: 2230 PDT

FIRE BEHAVIOR ANALYST

WEATHER SUMMARY: High pressure now off the Pacific Northwest coast extends southeast along the California coast. This will cause the current warming and drying trend to continue through the afternoon before ending on Sunday. Winds aloft are becoming predominately northeast to east and will shift to more southeast tonight. Any gusty offshore winds will be diminishing with a return to more normal speeds. The outlook calls for the west coast high to slowly shift east and allow a weak area of lower pressure to near the coastline late Sunday or Monday. This will cause a shift in winds to more southwesterly, deepen the marine layer enough to possibly spread into interior valleys, and spread cooler and moister air into inland valleys.

WEATHER FORECAST

WEATHER: CLEAR SKIES. SMOKE LIFTING OUT OF CANYONS BY MID MORNING.

TEMPERATURES: AFTERNOON HIGHS 88-95 ON LOWER SLOPES AND 75-85 HIGHER PEAKS AND RIDGES.

HUMIDITY: MINIMUM RH 16-25 PERCENT ON LOWER AND MID SLOPES. MINIMUM OVER HIGH TERRAIN 22-28 PERCENT.

RIDGETOP WINDS: NORTHEAST TO EAST IN THE MORNING 6-14 MPH WITH LOCALLY STRONGER GUSTS SHIFTING TO MORE SOUTHEASTERLY IN THE AFTERNOON 6-12 MPH.

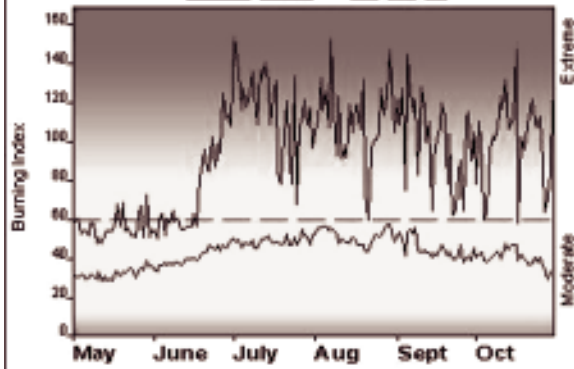
SLOPE WINDS: LIGHT AND VARIABLE EARLY MORNING. UPSLOPE 3-7 MPH BY 1000 INCREASING TO 5-12 MPH DURING THE AFTERNOON.

OUTLOOK FOR NEXT SHIFT (1800-0600) SATURDAY NIGHT CLEAR SKIES. INVERSION FORMING AROUND 2300 FEET. CONTINUED WARM ON MID AND UPPER SLOPES THROUGH THE NIGHT WITH OVERNIGHT LOWS

66-74. LOWER ELEVATION LOWS 62-68. MAXIMUM HUMIDITIES MID AND UPPER SLOPES 22-30 PERCENT AND HIGHER IN VALLEY BOTTOMS AT 40-55 PERCENT. RIDGE WINDS MOSTLY SOUTHEASTERLY 5-10 MPH. DOWNSLOPE WINDS 1-4 MPH INCREASING TO 2-7 MPH BY MIDNIGHT EXCEPT LIGHT AND VARIABLE IN DRAINAGE BOTTOMS BELOW THE INVERSION LAYER.

FIRE DANGER -- Los Padres NF, SantaBarbara RD

Maximum, Average, and 90th Percentile



Fire Danger Area:

- Los Padres Nat. Forest
- Santa Barbara RD
- NFDRS Area 586

Fire Danger Interpretation:



- EXTREME** -- Use extreme caution
- (Caution)** -- Watch for change
- Moderate** -- Lower Potential, but always be aware

Maximum -- Highest Burning Index by day for 1972 - 2001

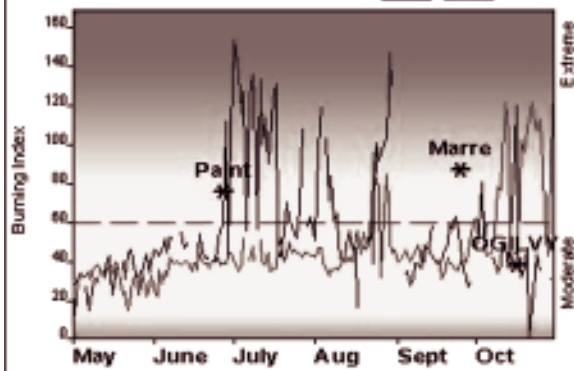
Average -- shows peak fire season

90th Percentile -- Only 10% of the days from 1972 - 2001 had an Burning Index above 59

Local Thresholds - Watch out:

- Combinations of any of these factors can greatly increase fire behavior:
- 20' Wind Speed over 15 mph, RH less than 35%,
- Temperature over 88
- Live fuel moisture below 60%,
- Burning Index over 42

Years to Remember: 1985 1999



Fuel Model: B - California Chaparral

Remember what Fire Danger tells you:

- ✓ Burning Index gives day-to-day fluctuations calculated from 2 pm temperature, humidity, wind, daily temperature 8 hr range, and precip duration.
- ✓ Wind is part of BI calculation.
- ✓ Watch local conditions and variations across the landscape -- Fuel, Weather, Topography.
- ✓ Listen to weather forecasts -- especially WIND.

Past Experience:

The Santa Barbara RD has had one of the most costly urban interface fires:

- Painted Cave - 1990 - 4,267 acres
841 structures were lost, most within 2 hours of the initial report. Sundowner winds were reported to be 40-70 mph. One civilian fatality.

Other large fires include:

- Marre - 1990 - 40,201 acres
- Ogilvy - 1998 - 4,000 acres

- HEADS UP for Sundowner Winds: Strong downslope winds can reach well over 30+ mph, very low relative humidity, and temps can rise above 100 deg F at the coast.
- HEADS UP for freshkilled brush and snowkilled brush. April 2002

Developed by NAGFDR-National Advisory Group for Fire Danger Rating

FIRE BEHAVIOR FORECAST

FORECAST NO: 12

FOR: 0600-1800 DAY SHIFT

NAME OF FIRE: MARRE
20XX

SHIFT DATE: SEPT 30,

TIME AND DATE: SEPT. 29, 20XX
FORECAST ISSUED: 2130

SIGNED: Richard Carmichael
FIRE BEHAVIOR ANALYST

WEATHER SUMMARY: See attached fire weather forecast.

FIRE BEHAVIOR

GENERAL: FIRE ACTIVITY WILL BE MUCH THE SAME AS DAY SHIFT YESTERDAY. FUEL MOISTURES CONTINUE DRYING AND ANY UNBURNED FUELS HAVE THE POTENTIAL TO SPREAD RAPIDLY. EXPECT INVERSION TO CLEAR AROUND NOON, HOWEVER, FIRE WILL BE ACTIVE ABOVE 2500 FEET THROUGHOUT THIS SHIFT. EASTERLY WINDS ARE DIMINISHING AND SHOULD NOT HAVE THE IMPACT ON THE DIVISIONS AS YESTERDAY, WITH THE EXCEPTION OF DIVISION D. THIS PORTION OF THE FIRE, ESPECIALLY AT THE HIGHER ELEVATIONS, WILL HAVE THE WIND PUSHING ANY FIRE TOWARDS THE LINE.

SPECIFIC: BRANCH I DIVISION D – EASTERLY WINDS HAVE THE POTENTIAL TO CAUSE ANY UNBURNED FUELS TO SPREAD RAPIDLY TOWARDS THE LINE AND SPOTTING COULD OCCUR FROM ANY FLAREUPS.

BRANCH II DIVISION V – THIS DIVISION EXPERIENCED A SIGNIFICANT UPHILL RUN YESTERDAY AS SLOPE AND SOLAR RADIATION CAME INTO ALIGNMENT. CONDITIONS EXIST TODAY FOR A SIMILAR OCCURRENCE AS A LARGE AREA ADJACENT TO FIRE IS SOUTHERLY EXPOSURE. IF FIRE BACKS TO THE BOTTOM OF ONE OF THESE SLOPES EXPECT ANOTHER INTENSE UPHILL RUN.

AIR OPERATIONS: EXPECT GUSTY WIND CONDITIONS OVER THE FIRE THIS MORNING. IMPACTS ON HELICOPTER OPERATIONS SHOULD BE LESS TODAY THAN YESTERDAY, AS THE WIND SPEED SHOULD NOT BE AS HIGH.

SAFETY: MAINTAIN SITUATION AWARENESS AT ALL TIMES, DON'T LET UP BECAUSE THE LAST FEW SHIFTS HAVE BEEN RELATIVELY INACTIVE. YESTERDAY'S FLAREUP IN DIVISION V WAS TRIGGERED BY A DUST DEVIL PICKING UP AND FANNING TO LIFE DYING EMBERS. ALONG WITH SPOTTING AND ROLLING MATERIAL, THESE DEVILS HAVE THE POTENTIAL TO SPREAD FIREBRANDS INTO UNBURNED FUELS AS HAPPENED ON DIVISION V YESTERDAY.





Wildland Training (STEN) for Structural Firefighters, G-330

Unit 2 - Structure Triage

OBJECTIVES:

Upon completion of this unit, students will be able to:

1. List the three structure triage categories.
2. List five factors upon which to base structure triage decisions and give three examples of each.
3. List four conditions that may indicate a structure cannot be saved.

I. STRUCTURE TRIAGE

A. Introduction

Structure Triage—the sorting and prioritizing of structures requiring protection from wildland fire.

Triage may be required of anyone at any time on the incident—from the incident commander doing reconnaissance to the engine crew moving into position.

The first consideration of structural triage must always be firefighter safety.

The goal of triage is to do the most good with what you have, and to not waste limited resources or time. It requires you to quickly categorize threatened structures.

B. Structure Triage Categories

- Needs little or no attention for now
- Needs protection, but savable
- Cannot be saved

There are no fixed answers based on the structure itself; no one can look at a house and the fuels alone and choose the category that will always apply.

II. THE DECISION PROCESS

This section outlines and illustrates a consistent and logical process for reaching a decision based on all the relevant factors.

A. Greatest Potential Threat

Look at the greatest potential threat, based on the assumption that the fire behavior will be the worst possible under the prevailing conditions.

While you may not base your actions on such a possible threat, at least have an alternative plan should the worst develop.

Consider:

1. Fuels (in your estimation of their driest condition), firebrands, worst weather that might occur, and terrain.
2. Greatest vulnerability of the structure.

B. Probable Threat

Look at the probable threat, based on the fire behavior that is most likely to occur under the conditions. It is this situation that should guide your decision on the action to take.

Consider:

1. The actual fire intensity and firebrand problem you expect.
2. Those aspects of the structure that remain vulnerable under the expected fire behavior even with some clearing and protective action being taken.

- C. When will the fire arrive and how long will the threat to the interface last?

This will determine your preparation and commitment time. When other resources arrive will determine their usefulness. Consider:

1. Rate of spread and intensity.
2. Orientation dynamics of the fire as it moves into the structures.
3. Arrival times of other resources.

- D. What can be done with the resources that are available?

This has to be your best judgment of what you can accomplish in the face of the expected threat. You must reach your decision on where to put your effort. One approach is to imagine the effect of putting all required resources on the most threatened structure.

Based on that outcome, look at the effect of shifting resources to other, less threatened structures. In the final analysis you want to save the most structures.

If the most threatened structure cannot be saved, forget it. Then access the next most severely threatened structure. If it cannot be saved either, then move to the next most threatened, etc.

If a threatened structure can be saved, you must still decide if that is the best thing to do. Even though you save one, the effort might cause you to lose others that could have been saved.

Ask what will happen if resources are applied to less threatened structures instead. If you can then save only a different structure, but no more than one, go for the tough ones.

If, on the other hand, you can then save two or more structures, drop the more threatened ones. Continue the “what if” process until you feel you are at a point where you can save the most structures with the help you have.

III. FIVE FACTORS THAT AFFECT YOUR TRIAGE DECISION:

- Structure itself
- Surrounding fuels (defensible space)
- Fire behavior
- Available resources
- Firefighter safety

A. Structure

Are the structure and exposure susceptible?

Construction features and condition:

1. Roof
 - a. Combustible (wood shakes, tar paper, etc.)
 - b. Not combustible (tile, metal or fiberglass, etc.)
 - c. Pitch (debris on roof or in gutter)
2. Siding
 - a. Combustible (wood)
 - b. Not combustible (metal, brick, etc.)
3. Heat traps
 - a. Open gable
 - b. Vents without screens or non-fire resistant screens
 - c. Overhanging decks
4. Windows
5. Size and shape of building
6. Position on slope

B. Fuels

The surrounding fuels, including fuels that could produce spot fires.

1. Surrounding fuels
2. Size and arrangement
3. Age
3. Proximity
5. Loading
6. Types of fuel
 - a. Resistant or flammable
 - b. Landscape/ornamental
 - c. Grass, brush, timber, exotic (palmetto, etc.)
7. Wood piles
8. Landscaping (railroad ties, wood fences)
9. Defensible space, access
10. Yard accumulation
11. Flame or heat duration
12. Explosive (LPG tanks, diesel or gas storage tanks)
13. Other hazardous materials, vehicles, etc.

- C. Fire Behavior (how the fuels will burn)
 - 1. Rate of spread and direction
 - 2. Topographic influence
 - 3. Weather influence
 - 4. Flame length
 - 5. Spotting/firebrands
 - 6. Timing
 - 7. Natural or other barriers

- D. Resources (what is available and when)
 - 1. On site resources (water, hand tools, ladders, equipment)
 - 2. Kind and type of equipment available
 - 3. Number
 - 4. Where they are (location)
 - 5. When available (response time)
 - 6. Capabilities and limitations
 - a. Mobility
 - b. Water/foam/retardant

E. Firefighter Safety

1. Ingress/egress routes
 - a. Adjacent fuels
 - b. One way-two way
 - c. Canopy
 - d. Slope and steepness of road
 - e. Loops
2. Power lines
3. Smoke/visibility
4. Hazardous materials
5. LPG and fuel storage tanks
6. Many others (remote wooden bridges, fire crossing road, etc.)

IV. CONSIDER ALL THE FACTORS

Triage is a logical process, not an answer or simple formula. It requires you to make basic predictions of fire behavior. It requires you to estimate the capabilities and availability of resources. You must base your decisions on probabilities; play the odds.

Several triage checklists have been developed for use by homeowners and firefighters. These checklists can be used for educating the homeowner in the procedure of making his/her home fire survivable.

The same form can be used in emergency situations to analyze defensible space and help the firefighter determine actions that may be necessary to save the structure.

Currently, there are trends in fire-wise communities to develop placarding type systems designating houses that are fire safe.

See website at <http://www.firewise.com>.

GROUP EXERCISE: Read the situation below, then discuss the triage decision you would make for each case.

Situation: Two houses are adjacent, 50 feet apart. House #1 has wooden walls, a wood-shake roof, and is surrounded on three sides by brush. House #2 has better clearance, grass around the house, and a composition shingle roof.

Case 1: The fire is burning only the leaf litter, moving progressively past the two houses. You have a full 500- gallon tank of water and are the only engine available. What would you do?

Case 2: The fire is burning the brush, hitting broadside and threatening both houses at the same time. You have 250 gallons of water left and are the only engine available. House #1 will receive direct flame impingement; house #2 will receive only firebrands. What would you do?

Case 3: As in Case 2, the fire is burning the brush and threatening both houses at the same time. This time you have a full tank of water, 500 gallons. You can protect house #1 as the fire hits it and in the process will significantly diminish the intensity at the head of the fire. A second engine will be there within 5 minutes. What would you do?

DECISION MAKING EXERCISE: Read the scenario and write your solutions on a flip chart.

Scenario:

You are sent into an area with four houses. Burning conditions are so severe that you can expect the standing live fuels to burn readily. You have a full tank of water (500 gallons), but no other resources will be available until after the fire is well past.

The most threatened house (#1) is located in heavy fuels. It would require all your water to save, and the other houses would be involved by the time you could be free again.

The second worst house (#2) is located in moderately heavy fuels; it would require half your water and commitment of 10 to 20 minutes to save it.

The last two houses (#3 and #4) are threatened only by firebrands on the roof.

What would you do?

VI. WHEN STRUCTURES CANNOT BE SAVED

No simple rule will tell you when to try, or what time to abandon, a structure defense effort. Listed below are some factors or conditions worth noting. If any of these apply then the attempt to save that structure deserves careful consideration before continuing.

- The fire is making significant runs (not just isolated flare-ups) in the standing live fuels; for example, the brush or tree crowns and the structure is within 1 or 2 flame lengths of those fuels.
- Spot fires are igniting around the structure or on the roof and beginning to grow faster than you can put them out.
- Your water supply and stream flow will not allow you to continue firefighting until the threat subsides.
- You cannot safely remain at the structure and your escape route could become unusable (blocked by fire, falling or rolling obstacles, etc.).
- The roof is more than 1/4 involved, in windy conditions, and other structures are threatened or involved.
- Interior rooms are involved and windows broken, in windy conditions, and other structures are threatened or involved.

VII. SUMMARY

If things change, or if you are losing the battle, rethink your plan, but do not continually question or regret your decisions.

Time wasted in indecisions is very costly. This is not a situation that allows lengthy deliberations.

The situation does not allow more than a best judgment and a good effort.

Make decisive judgments and make them without undue delay. Then go to work.



Clackamas County Fire District

Home & Property Pre-Treatment

Address/Description _____	
Date _____	Time _____
Task Force/Strike Team _____	Engine _____
Officer/Firefighters _____	

Utilities:

Pets:

Pre-Treatment Efforts:

Notes:

Signature/Title/Agency



Clackamas County Fire District

Structure Triage Checklist

Address or Description _____			
DRIVEWAY	Too narrow or steep to back in -or- Branches overhang driveway -or- Down-dead fact line drive.	YES	NO
ROOF	Already involved in fire.		

IF YES checked for either above, STUP! Write off!

Triage Officer _____ Engine No. _____

DRIVEWAY	Dead-end & longer than 200 feet	YES	NO
ROOF	Combustible (asphalt shingles or wood)		
ROOF	Wood shakes		
TREES	Overhang roof		
TREES/BRUSH	Not thinned in area within 30' of structure		
VEHICLES	Parked outside within 30' of structure		
SLOPE	More than 20% anywhere within 30' of structure		
SLOPE	More than 40% anywhere within 30' of structure		
DECK/TILT	Not enclosed underneath (to grotted)		
POWER LINE	Overhead within 30' of structure		

of YES

Number of YES checked _____

0 - 2	DOESN'T NEED DEFENDING
3 - 5	DEFEND AGGRESSIVELY
6 - 7	DEFEND CAUTIOUSLY
8 - 10	WRITE OFF!

Write off cases listed against you over 30 mph.

NOTES:

STRUCTURAL TRIAGE ASSESSMENT

Incident Name

TOPOGRAPHY (SLOPE %)	0 to 20% = 1	
	20 to 40% = 3	
	> 40% = 5	
FUEL TYPE (Include yard accumulation)	Light = 1	
	Moderate = 3	
	Heavy = 5	
FUEL CLEARANCE	> 100' = 1	
	30 to 100' = 3	
	< 30' = 5	
ARIEL FUEL (Crown Closures)	< 30% = 1	
	30 to 70% = 3	
	> 70% = 5	
ROOF	Non -combustible = 1	
	Non w/ combust debris = 3	
	Combustible = 5	
SIDING	Non -combustible = 1	
	Non w/ combust deck = 3	
	Combustible = 5	
OTHER STRUCTURES	Discretion = 0, 1, 3, 5, 10	
ACCESS	2 ways in/out road = 1	
	1 good road in = 3	
	1 poor road in = 5	
	Road width > 20' = 1 Road width < 20' = 5	
UTILITIES	Underground = 1	
	Above ground = 5	
	Water on site = 1	
	No water on site = 5	
FIRE PROTECTION	Defensible = 1	
	Needs work to defend = 3, 5, 10	
FUEL STORAGE (Propane, gas, diesel)	Discretion = 0, 1, 3, 5, 10	

Total Score

MATRIX RATING

20-30 = Easy; 35-50 = OK with work;
>50 = Hard

Jurisdiction

Structure Location
GPS _____
Legal Description
Prepared by _____
Date _____ Time _____

Owners Name _____
Address _____
Phone _____
Occupied yes/no _____ Locked yes/no _____
Pets/livestock _____

Photo

Site Map

Wildland Training (STEN) for Structural Firefighters, G-330

Unit 3 – Structure Protection Tactics: Hand Crews, Aircraft, and Heavy Equipment

OBJECTIVES:

Upon completion of this unit, students will be able to:

1. List four ways hand crews can be used in structure defense.
2. List three safety considerations when aircraft are used in structure defense.
3. Describe hazards commonly encountered by heavy equipment operations.

I. HAND CREWS

Hand crews can be an effective suppression resource in an interface fire situation.

- Construct handline: direct control, protect structures and burn out.
- Site and structure preparation: remove fuels, trim shrubs and trees, move flammable materials.
- Set up hose lays: for use by engines or drafting from portable tanks or pools.
- Support engine crews: setting up and utilizing working lines, site preparation.
- Conduct burnout operations: many hand crews have extensive experience in firing operations.
- Mop up and patrol: hand crews can complete mopup operations, while engines move on to other assignments.

A. Hand Crew Types and Capabilities

Hand crews are organized by ICS type which relates to the level of experience and capabilities of the crew. All ICS hand crew types will have from 18 to 20 members, including a crew boss.

B. ICS Hand Crew Types

- Type I Crews - Full time organized crews, experienced leadership, highly trained.
- Type II Crews - Contract crews or Emergency Hire (EFF). Type II crews can be variable in experience and capabilities (transportation, sawyers, chainsaws).
- Inmate Crews - Considerations around structures usually need to be kept together in close proximity for observation by law enforcement.

C. ICS Hand Crew Strike Team

ICS defines a hand crew strike team as 36 members including the crew bosses. They may have more than 36, but not less. Generally a hand crew strike team is two crews.

D. Use of Hand Crews

1. Order hand crews by ICS type based upon the complexity of your fire.

If extensive burnout operations and saw work are anticipated, order Type I Hotshot crews.

2. Type II crews are excellent for site preparation, supporting engine crews and mopup work.

These crews often take longer to get on scene due to emergency hire status.

3. Check with the crew boss regarding the crew's experience and capabilities.

Most crew bosses are experienced firefighters; involve them in your planning process for maximum effectiveness.

4. Ensure that all crews have adequate transportation and communication in case rapid escape becomes necessary.

Make sure crews are informed of escape routes and safety zones.

II. AIRCRAFT OPERATIONS

Air tankers, helicopters, and small fixed-wing aircraft can be very valuable in interface fires. Aircraft use must be closely coordinated with ground units in order to be effective and safe in all aspects of utilization.

A. Air Tankers

Some considerations for air tanker use are type, size, capabilities, availability, turnaround time, Modular Airborne Firefighting System (MAFFS [Military]), Single Engine Air Tankers (SEATs).

Air tankers can drop water, foam, or retardant.

- Use retardant to pre-treat fuels between fire and structures.
- Can be used to slow down fire advance for attack by ground forces.
- Drops should be coordinated with air tactical group supervisor (ATGS) or air tanker coordinator (lead plane pilot).
- Communication with aircraft is critical for safety.
- Use extreme caution when dropping near crews, engines and structures.

B. Helicopters

Some considerations for helicopter use are type, size, capabilities, limitations, availability, and turnaround time.

ICS classifies helicopters into three types based on payload, passengers, or retardant/water capability.

1. Type I helicopters (heavy lift)

- Capable of dropping up to 2,000 gallons per drop.
- Minimum of 15 passengers and 5,000 lbs. payload.
- Most effective in stopping fire spread.
- Use caution around crews, engines, structures and power lines.
- Examples: Chinook Sky Crane, Bell 214, Black Hawk.

2. Type II helicopters (medium lift)

- Minimum capability of 300 gallons, 2,500 lbs. payload, and 9 passengers.
- Can be used for precision hot spotting and dropping around structures.
- Examples: Bell 204, 205, and 212.

3. Type III

- Minimum water capability of 100 gallons, 1,200 lbs. payload, and 4 passengers.
- Excellent for precision water, foam or retardant drops.
- Most effective for reconnaissance.
- Examples: Bell 206, and Hughes 500.

C. Fixed Wing Aircraft

Useful in reconnaissance, operations support and air operations coordination (air tactical group supervisor).

D. Aircraft Coordination

Coordination of air and ground operations is essential. Ensure pilots have communication with ground units for maximum safety.

Only one person should be communicating with aircraft to direct water drops. IAIC, Division Supervisor or ground units designated by these individuals should coordinate with aircraft for location of water drops.

Use identifying landmarks that are distinct to both pilots and ground forces in describing location of air drops.

Order aircraft as soon as possible through your local dispatch center. If you feel aircraft are necessary and can provide assistance in structure protection, don't be afraid to make the request.

E. Retardant and Aerial Foam

The standard retardant is “**long term**” retardant. It knocks down fire well and has a lingering fire retardant effect. The long term retardant can help reduce fire intensities in fuels coated with it for several hours.

“**Short term**” retardant or foam has a good knock down capability, but it lacks the lasting fire retardant properties of long term retardant. It will not be effective for much more time than it takes for the major part of the water to evaporate out of it.

It is not recommended to call for a retardant drop directly onto a structure as severe structure damage may result. It is preferred to lay a line coating the fuels between the fire and the structure.

The possible damage to structures and vehicles by retardant may impact the way retardant aircraft are used.

None of the retardants or water, applied from the air, can be counted on for total extinguishment. **Their effectiveness depends upon prompt follow-up by ground forces.**

F. Hazards and Limiting Conditions of Aircraft Use

1. Hazards

Aircraft that are operating near the ground create hazards to personnel in the vicinity.

Both fixed wing and rotary wing aircraft generate vortices that can reach the ground. They often take the form of a strong, turbulent wind; the fire may flare up or cross a control line.

The retardant drop can injure personnel and damage equipment. Crews should stay out of the drop area, and protect themselves if being hit is not avoidable.

2. Limiting conditions

Power lines, other wires or cables, guy lines and towers or poles are a deadly threat to aircraft. They are often abundant in the vicinity of structures. Always alert aircraft to such hazards; they are difficult to see from the air.

Ground personnel should avoid power lines during air drops.

- Wind can be quite turbulent just above trees and topographic obstacles, may limit or preclude aircraft use. Wind exceeding 20 miles per hour is enough to cause problems.
- Smoke, fog, and inversions can reduce visibility to the point that aircraft cannot operate.

III. HEAVY EQUIPMENT OPERATIONS

Heavy equipment can be very effective in interface operations. It can do work impossible to accomplish any other way. It does have limitations, however, that we will cover in this unit.

Heavy equipment can best be used before a fire reaches the interface. If time allows, mineral soil firelines can be constructed in advance of the fire front.

These lines may stop or slow the fire, be used with backfires to widen firelines, or used during burnout operations to secure a fire.

Water or retardant used with heavy equipment during fireline construction can be very effective to stop or slow a fire's advance.

Other uses of heavy equipment are to build access routes, emergency safety areas, etc. **Note:** Numerous types of non-traditional heavy equipment can be used in the interface. However, if the equipment is under direct control of federal agencies, it must be inspected and signed-up.

A. Types of Equipment

1. Dozers (bulldozers)

ICS classifies dozers into three types based on horsepower (hp).

- Type 1 (Heavy), minimum 170 hp
- Type 2 (Medium), minimum 93 hp
- Type 3 (Light), minimum 65 hp

These large full tracked vehicles with a front mounted blade are very effective to construct wide firelines, move heavy fuels, construct roads, build safety zones, clear helicopter landing areas, etc.

2. Tractor plow (crawler tractor with plow)

- ICS classifies tractor/plows into six types based on horsepower.
- Used primarily in the southeast by wildland fire protection agencies and is the primary firefighting tool.
- The tractor/plow is very mobile, powerful, and reasonably fast in constructing firelines (4 ft. wide) adjacent to improvements in advance of the approaching fire.
- Can be used in conjunction with a burnout operation for effectiveness in heavy fuels.

3. Farm tractors with off-set disk

- Common all over the United States.
- Excellent for prairie fires in the Great Plains from Texas to the Dakotas.
- Can be used close to improvements resulting in less environmental damage. However, they are only effective in light fuels.

4. Road graders

- Limited by adverse terrain conditions.
- Very effective in light fuels in desert and range.
- Can be used for indirect attack around improvements.

5. Logging equipment can be very effective in site preparation.

B. Hazards

As with any large, powerful machinery, heavy equipment is hazardous when operated, particularly in the urban interface.

What are some of the hazards commonly encountered?

C. Safety

Keep all personnel out of the vicinity of heavy equipment while working.

Ensure the equipment operator has all required personal protective equipment and communication with equipment supervisor (dozer boss).

Provide information on identified hazards prior to beginning work.

Wildland Training (STEN) for Structural Firefighters, G-330

Unit 4 – Structure Protection Tactics: Firing Operations

OBJECTIVES:

Upon completion of this unit, students will be able to:

1. List three situations in which burning out may be necessary in structure defense.
2. Describe who makes the decision to conduct a firing operation.
3. List three types of control lines used in firing operations.

I. FIRING OPERATIONS

Firing operations involve the use of fire to conduct burn outs and backfires. It is important to understand the difference between the two.

A. Burning Out

Burning out is used with direct attack. In direct attack, a fireline is built close to the edge of a fire.

Burning out is setting fire inside the fireline to consume fuel between the fireline and the fire.

It is generally accepted that operations personnel from crew boss on up have authority to burn out.

B. Backfiring

Backfiring is an indirect method of attack. It is the act of setting fire inside the fireline to:

- Consume the fuel in the path of a fire.
- Change direction or force of the fire's convection column.
- Slow or change the fire's rate of spread.

The decision for backfiring is usually made by the operations section chief, based on recommendations from other operations personnel.

C. When to Burn Out or Backfire

- You cannot wait for the main fire to reach your established control line.
- The control line will not hold the main fire if it moves against it at full force.
- The intensity of the main fire at the control line would be great enough to threaten the structure.

Caution: Use of fire is dangerous—communication and coordination must be maintained at all times. Make sure you know your agency policy concerning burning out and backfiring.

II. TIMING AND COORDINATION

- Firing should not be done if the fire will create problems for adjoining forces or would result in a threat to other structures in the area.
- Firing should not be initiated until the control line to hold it is in place.
- Make sure that firing is necessary, do not make the decision to fire without consultation with command and other forces in your area.
- Coordinate your firing operation with those around you and with those planning the overall attack. Let them know of your plan; advise when you begin firing.
- Sometimes it is necessary to wait for favorable conditions, such as appropriate wind or humidity.
- Firing to strengthen the control lines should be done as soon as the above concerns are met. Make sure you have adequate forces available to patrol the firing operation.

III. CONTROL LINES

A. Mineral Soil

Constructed with hand crews or mechanical equipment. Make sure the control line is wide enough to hold the fire.

B. Natural or Human Made Features

Rock outcrops, dirt roads, asphalt or agricultural fields.

C. Wet Lines (water/foam/retardant)

- A wet line is a wetted strip using water, foam, or retardant to act as a control line.
- Where fuels are light, such as grass or litter, use a wet line to control the firing operation. Wet lines are quick and easy to create.
- If the fuel is low and easily penetrated, it works well to wet the strip and then to fire it. The fire goes out as it burns to the wet line.
- If the fuel is high or matted down, the wet line will not penetrate deeply enough. The fire will creep back under the line after the firing operation has moved on. In such cases, light the fire first, then use the water stream to control the inner edge of the fire, making sure it is extinguished.
- When firing from a wet line, it often pays to take advantage of areas of lower fuel. Examples include grass that has been grazed down and tire tracks from vehicles where the grass has been crushed.

IV. FIRING AND HOLDING

Personnel assigned to firing and holding operations must be certified and under the supervision of a qualified firing boss.

A. Basic Firing Operations

In any firing operation, the overall progress along the line should be against the wind or slope that is pushing the fire along the line.

In other words, take the firing operation into the wind or down the slope.

If wind and slope oppose each other, key on the one that is the strongest.

- If the weather conditions are in your favor, the fire will move quickly away from the control line and should cause no real problems. Just light the edge of the fuel along the control line.
- Fuels outside and adjacent to the control line can be wet down ahead of the firing operation to prevent spotting. Foam works very well for this application.
- Space personnel and equipment out along the line. Do not advance the firing operation until the fire along the line is no longer a threat at that location. The firing operation should not move ahead any faster than the holding operation can keep up with.

B. Firing Techniques

There are many firing techniques, but two that work well on interface fires are:

1. Strip firing

It involves setting fire to one or more strips of fuel and allowing the strips to burn together. Lighting numerous strips allows faster area ignition.

By varying the width of the strips and their location in relation to the slope or wind direction, a means of regulating the fire's intensity can be provided.

2. Ring firing

This technique is generally used as an indirect attack and backfire operation. It involves circling the perimeter of an area with a control line and then firing the entire perimeter.

Ring firing is often used to burn out around structures. However, firing personnel may not have a strong anchor point to commence firing. Escape routes and safety zones must be established.

C. Holding

- Engines, hose lines, or hand crews should be deployed along the line behind the firing operation.
- The holding operation must be capable of dealing with hot spots or escaped fire across the control line.
- Do not impair the intentional fire. Knock down hot spots and flare-ups that threaten to escape, either by flame or firebrands.
- If an escape occurs, put all the necessary resources to work to contain it. Advise the crews doing the lighting of the escape so that they can slow down or stop until the escape is controlled.

