

Engine Boss

S-231



NFES 1400

Instructor Guide

MAY, 2004



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:

Engine Boss, S-231
Certified at Level I

This product is part of an established NWCG curriculum. It meets the COURSE DEVELOPMENT AND FORMAT STANDARDS – Sixth Edition, 2003 and has received a technical review and a professional edit.

Member NWCG and Training Working Team Liaison

Date

5/14/04

Chairperson, Training Working Team

Date

5/3/04



S- 231

ENGINE BOSS

Description of the Performance Based System

The NWCG Wildland and Prescribed Fire Qualifications System is a “performance-based” qualifications system. In this system, the primary criterion for qualification is individual performance as observed by an evaluator using approved standards. This system differs from previous wildland fire qualifications systems which have been “training based.” Training based systems use the completion of training courses or a passing score on an examination as primary criteria for qualification.

A performance-based system has two advantages over a training based system:

- Qualification is based upon real performance, as measured on the job, versus perceived performance, as measured by an examination or classroom activities.
- Personnel who have learned skills from sources outside wildland fire suppression, such as agency specific training programs or training and work in prescribed fire, structural fire, law enforcement, search and rescue, etc., may not be required to complete specific courses in order to qualify in a wildfire position.

1. The components of the wildland fire qualifications system are as follows:

- a. Position Task Books (PTB) contain all critical tasks which are required to perform the job. PTBs have been designed in a format which will allow documentation of a trainee’s ability to perform each task. Successful completion of all tasks required of the position, as determined by an evaluator, will be the basis for recommending certification.

IMPORTANT NOTE: Training requirements include completion of all required training courses prior to obtaining a PTB. Use of the suggested training courses or job aids is recommended to prepare the employee to perform in the position.

- b. Training courses and job aids provide the specific skills and knowledge required to perform tasks as prescribed in the PTB.
- c. Agency Certification is issued in the form of an incident qualification card certifying that the individual is qualified to perform in a specified position.

2. Responsibilities

The local office is responsible for selecting trainees, proper use of task books, and certification of trainees. See Appendix A of the NWCG Wildland and Prescribed Fire Qualification System Guide, PMS 310-1, for further information.

**National Wildfire Coordinating Group
Training Working Team
Position on Course Presentation and Materials**

The suggested hours listed in the Field Manager's Course Guide are developed by Subject Matter Experts based on their estimation of the time required to present all material needed to adequately teach the unit and course objectives. The hours listed can vary slightly due to factors such as the addition of local materials. NWCG is aware that there have been courses presented in an abbreviated form, varying greatly from the suggested course hours. Instructors and students are cautioned that in order to be recognized as an NWCG certified course certain guidelines must be followed. These guidelines are:

- Lead instructors are encouraged to enhance course materials to reflect the conditions, resources and policies of the local unit and area as long as the objectives of the course and each unit are not compromised.
- Exercises can be modified to reflect local fuel types, resources and conditions where the student will be likely to fill incident assignments. The objectives and intent of the exercises must remain intact.
- Test questions may be added that reflect any local information that may have been added to the course. However, test questions in the certified course materials should not be deleted to ensure the accurate testing of course and unit objectives.
- Test grades, to determine successful completion of the course, shall be based only on the questions in the certified course materials.

If lead instructors feel that any course materials are inaccurate, that information should be submitted by e-mail to NWCG Fire Training at nwcg_standards@nifc.blm.gov. Materials submitted will be evaluated and, where and when appropriate, incorporated into the appropriate courses.

Course Length for NWCG Courses

If a course is available through PMS the *recommended* course hours and the "NWCG Position on Course Presentation and Materials" will be adhered to by the course instructors.

If the course is not available through PMS, e.g., L-380, and has been developed using NWCG course criteria, *minimum* course hour requirements have been established and must be adhered to by the course developer and the course instructors.

Course hours for all NWCG courses can be found in the Field Manager's Course Guide <http://www.nwcg.gov/pms/training/fmcg.pdf>. If the hours are a minimum versus recommended they will be stated as such.

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Sponsored for NWCG publication by the NWCG Training Working Team.

Comments regarding the content of this publication should be directed to:
National Interagency Fire Center, National Fire Training Support Group, 3833 S. Development Ave., Boise, Idaho
83705. E-mail: nwcg_standards@nifc.blm.gov.

Additional copies of this publication may be ordered from National Interagency Fire Center, ATTN: Great Basin
Cache Supply Office, 3833 South Development Avenue, Boise, Idaho 83705. Order NFES 1400.

ENGINE BOSS (Single Resource), S-231

PREFACE

This course has been developed by an interagency development group with guidance from the National Interagency Fire Center, Fire Training under the authority of the National Wildfire Coordinating Group (NWCG). The development group is made up of the following:

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ALSO INCLUDED ON THE INSTRUCTOR GUIDE CD-ROM

Student Workbook (S-231_Student Workbook.pdf)

INTRODUCTION

Engine Boss, S-231 is a 12 to 16 hour course designed to meet the training needs of an incident Engine Boss outlined in the Wildland and Prescribed Fire Qualification System Guide, PMS 310-1, and the Position Task Book (PTB) developed for the position of Single Resource Boss, Engine (ENGB).

The Wildland and Prescribed Fire Qualification System Guide, PMS 310-1 provides guidance and a national wildfire standard for establishing minimum training, skills and knowledge, experience and physical fitness requirements for the participating agencies of the National Wildfire Coordinating Group (NWCG).

The Instructor Guide contains all the information and references necessary for the course coordinator, instructors, and students. The course instructions contain the information concerning course administration. Subject material is presented in units of instruction. Exercises in the units are designed to demonstrate procedures. Reference material is provided to assist the student both in the classroom and on the job.

This course is designed to be interactive in nature. It contains several exercises designed to facilitate group and class discussion. The instructor cadre must be familiar with the course instructions and the exercises. Any modifications made to address local concerns must be discussed and agreed upon by the instructor cadre well before the course is presented to the students.

COURSE INSTRUCTIONS

This section contains instructions and information essential to the instructor in making an effective presentation. All instructors must read this section and be thoroughly familiar with all procedures and instructional material prior to the course presentation.

I. INSTRUCTOR PREREQUISITES

Refer to the Field Manager's Course Guide, PMS 901-1 for instructor prerequisites.

This guide is on-line at <http://www.nwccg.gov/pms/training/fmcg.pdf>.

Instructors must devote adequate time to prepare for the presentation of the simulations and exercises. The instructors must work through the exercises together and agree upon the solutions. The instructors should also review the final test to insure that all material is covered.

II. STUDENT TARGET GROUP

This course is suggested training for the position of Single Resource Boss, Engine (ENGB).

III. STUDENT PREREQUISITES AND RECOMMENDED TRAINING

A. Refer to the Field Manager's Course Guide, PMS 910-1 for course prerequisites.

B. Additional recommended training which supports development:

Basic ICS (I-200), Engine Boss (S-231), Ignition Operations (S-234), Interagency Incident Business Management (S-260), Basic Air Operations (S-270), Driving for the Fire Service (S-216), Fire Operations in the Urban Interface (S-215).

IV. PRE-COURSE WORK

The students will be required to read sections 1,2,3,4, and 6 of the Wildland Fire Suppression Tactics Reference Guide (WFSTRG). This reference will be sent to the students with the course selection letter. The students need to bring this reference to class.

V. COURSE SELECTION LETTER

A sample course selection letter is included at the end of this section. This letter should include information on pre-course work, date, time and location of the course, materials and references to bring to class, contact number and any other special instructions.

VI. COURSE MATERIALS

A. Refer to Appendix A, Course Ordering Information for a list of items to order for course presentation.

B. Notes To The Instructor

Notes to the instructor are provided in the units of instruction. These notes are in **BOLD CAPS** and are intended to aid the instructors with course presentation. Aids and Cues will appear in the right column with the following designators:

EP: Electronic Presentation

IR: Instructor Reference

SW: Student Workbook

Electronic presentations are included to enhance the course instruction. The locations for presentation are listed in the “Aids and Cues” column in the detailed lesson outline. Instructors will have to prepare their own transparencies from the electronic presentation if a computer projector is not available. *Print the Unit 4 scenario maps onto a transparency to project on an overhead to provide instructor solutions or to have the student present their solutions.*

C. The students should to bring to class:

- Fireline Handbook, PMS 410-1, NFES 0065 (including Appendix B)
- Position Task Book for Single Resource Boss, NFES 2318
- Wildland Fire Suppression Tactics Reference Guide, NFES 1256
Send this guide with the pre-course letter.
- Incident Response Pocket Guide, NFES 1077
- PPE

These items should be noted in the pre-course letter to the students. A sample letter is located at the end of this introduction section.

D. Student materials

Tables, chairs, pencils, pens should be supplied for each student.

E. Audiovisual equipment provided for the instructors should include:

- A computer/projector for electronic presentations. If a projection system (LCD) is not available, print the electronic presentation slides onto transparencies and project with an overhead projector.
- Viewing screen
- A white board with markers or chalkboard with chalk
- Easels with flipchart pads and felt tip marker

VII. COURSE LENGTH/TIME ELEMENT

A. Presentation Time

The Engine Boss, S-231 course will require approximately 12-16 hours for presentation. If agency specific material is added more time may be required.

B. Instructor Preparation

This course is presented with lecture and simulated fire exercises. Instructors must devote adequate time for their presentations and should draw from their experiences to add realism and credibility to the information provided.

VIII. RECOMMENDED CLASS SIZE

To allow for group interaction, mentorship and adequate facilities, the class should be limited to 24 students.

IX. SPACE AND CLASSROOM REQUIREMENTS

The characteristics of the classroom and supportive facilities have a great impact on the learning environment and the instructor's success or failure. Students will be formed into groups for the exercises in this course, intermixed according to experience level and geographic location of their home unit.

For the field exercise, the students may need to bring their own engine(s). If the cadre decide to use the sand table method, provide adequate time to gather necessary props and sand table facilities.

For this course, it is advisable for the instructor to adhere as closely as possible to the guidelines outlined in the Course Coordinator's Guide, NFES 2226.

X. COURSE OBJECTIVE

The course objective is stated in a broad term that will define what the student will be able to do after completing the course. The course objective for the Engine Boss course is:

Upon completion of this course students will be able to:

Perform the tasks of an Engine Boss in making the tactical decisions required to safely manage an engine and personnel on an incident.

XI. UNIT OBJECTIVES

Unit objectives appear at the beginning of each unit and define what the student will be able to accomplish at the completion of the unit.

Unit 0 – Introduction

1. Introduce the course to the students.
2. Introduce the instructors and the course coordinator.
3. Introduce the students.
4. Identify and explain any administrative concerns.
5. Explain course process and expectations.

Unit 1 - Engine and Crew Capabilities and Limitations

1. Identify engine capabilities and limitations that the Engine Boss must consider when deciding to attempt an assignment.
2. Describe assignments that require specialized training of engine crew members.

3. Describe the observations the Engine Boss must make of crewmembers to insure safety is not compromised.
4. Describe the criteria used to maintain the engine inventory.

Unit 2 - Information Sources

1. Identify sources of information needed to complete tactical assignment.
2. Describe the coordination required to accomplish tactical assignment.

Unit 3 - Fire Sizeup Considerations

1. Describe the sizeup elements in a fire situation.
2. Identify the four fuel groups and describe expected fire behavior in each.
3. Determine the tactics to be used after sizeup occurs.

Unit 4 - Tactics

1. Describe the advantages and disadvantages of direct, parallel, and indirect attack in a fire situation.
2. Develop alternative plans based upon equipment failures and/or personnel problems.
3. Determine appropriate tactics to be used based upon changes in fire behavior, fire weather, and terrain.

Unit 5 - Wildland/Urban Interface

1. Identify wildland/urban interface characteristics that must be monitored.
2. Describe safety hazards commonly encountered in wildland/urban interface fires.

Unit 6 - Final Examination

Obtain 70% or higher on the final examination to pass the course.

Unit 7 - Field Exercise

1. Obtain essential information from the Incident Commander and brief crewmembers and adjoining forces.
2. Maintain LCES and standard safety procedures.
3. Participate in an After Action Review.

XII. EVALUATION

Students must obtain 70% on the final examination for successful completion of this course. The final examination and exercises throughout the course may help identify any need for change and improvement in the course structure and content.

XIII. APPENDICES

The following appendix is included in the Instructor Guide:

- A. Course Ordering Information (Appendix A)

A list of materials to be ordered is included in this appendix. Items include instructor guide, student workbook, CD-ROM with electronic presentations, and other materials that are provided in the National Fire Equipment System (NFES) catalog.

The following appendices are located only on the Instructor Guide CD-ROM:

- B. Electronic Presentation Masters
(S-231_AppB - Electronic Presentation Masters)

- C. Course Evaluations and Final Exam
(S-231_AppC - Evaluations)

The following is also provided on the Instructor Guide CD-ROM:

Student Workbook (S-231_Student Workbook.pdf)

National Interagency Fire Center,
Fire Training
Training Standards Unit
3833 Development Avenue
Boise, Idaho 83705
e-mail: nwcg_standards@nifc.blm.gov

S-231 ENGINE BOSS
SAMPLE SELECTION LETTER

Congratulations on being selected to attend S-231 Engine Boss to be held at (*location*). The session will begin at (*time, date*), and end at (*time, date*).

The primary emphasis of this course will be to prepare individuals for the position of Single Resource Boss, Engine (ENGB).

The following pre-course work is mandatory:

Read sections 1,2,3,4, and 6 of the Wildland Fire Suppression Tactics Reference Guide (WFSTRG).

Bring the following items to class:

- Fireline Handbook, PMS 410-1, NFES 0065, including Appendix B
- Position task book for Single Resource Boss, NFES 2318
- Incident Response Pocket Guide, NFES 1077
- PPE

If you desire to receive a certificate of completion for the course, please do not make travel arrangements to arrive after the scheduled start time or to depart prior to the scheduled course completion time.

In the event you cannot attend the course, please contact the course coordinator at least 4 days prior to the beginning of the class. This allows time for notifying personnel that may be on the waiting list to be contacted to fill the vacancy.

If you have any questions please contact the course coordinator, *Name, phone number, e-mail*.

S-231 ENGINE BOSS
SAMPLE COURSE AGENDA

TUESDAY, March 25, 2003

- 0800 -** Unit 0, Introduction
Unit 1, Engine and Crew Capabilities and Limitations
Unit 2, Information Sources
Unit 3, Fire Sizeup Considerations
- 1130 -** **Lunch**
Unit 4, Tactics
Unit 5, Wildland/Urban Interface
- 1700 -** End of day one

Wednesday, March 26, 2003

- 0800 -** Unit 6, Final Exam
Unit 7, Optional Field Exercise
- 1130 -** **Lunch**
Unit 7, Optional Field Exercise, continued
- 1700-** End of day two

DETAILED LESSON OUTLINE

COURSE: Engine Boss (Single Resource), S-231

UNIT: 0 - Introduction

SUGGESTED TIME: 1 Hour

TRAINING AIDS: Personal computer with LCD projector and presentation software or overhead projector, flip chart pads for each group; felt tip markers; masking tape or tacks; Position Task Book for Single Resource Boss; Fireline Handbook; Incident Response Pocket Guide; Wildland Fire Suppression Tactics Reference Guide.

OBJECTIVES:

1. Introduce the course to the students.
2. Introduce the instructors and the course coordinator.
3. Introduce the students.
4. Identify and explain any administrative concerns.
5. Explain course process and expectations.

OUTLINE	AIDS & CUES
<p>I. PRESENT THE COURSE OBJECTIVE</p> <p>A. Course Objective</p> <p>At the successful completion of this course students will be able to:</p> <p>Perform the tasks of an Engine Boss in making the tactical decisions required to safely manage an engine and personnel on an incident.</p> <p>B. Course Instruction</p> <p>Making the correct tactical decisions to safely manage wildland fires is of utmost importance for the Engine Boss and their assigned personnel.</p> <p>Many factors make the tactical decision making process easier and more reliable for the Engine Boss.</p> <p>The daily tasks required of the Engine Boss are a constant and ongoing process. Coordination and communication with adjacent forces and the safe and effective deployment of assigned resources will be the focus of this course.</p>	<p>00-02-S231-EP 00-03-S231-EP</p>
<p>II. INTRODUCE THE INSTRUCTOR CADRE</p> <p>Introduce the instructor cadre and any guests.</p>	
<p>III. INTRODUCE THE STUDENTS</p> <p>THE INSTRUCTOR MAY CHOOSE ANOTHER METHOD FOR STUDENT INTRODUCTIONS, IF THEY HAVE ONE THEY PREFER.</p>	<p>00-04-S231-EP</p>

OUTLINE	AIDS & CUES
<p>Have all participants present the following information:</p> <ul style="list-style-type: none"> A. Name B. Work place, e.g., agency, station C. Job title and their day to day duties D. ICS qualifications E. Most recent engine operator experience on an incident <p>IV. SCHEDULE OF EVENTS</p> <ul style="list-style-type: none"> A. Course agenda and review <p>HAND OUT COURSE AGENDA AND REVIEW.</p> <p>SAMPLE AGENDA LOCATED IN THE INTRODUCTION SECTION, P. 13. DISCUSS FIELD EXERCISES.</p> <ul style="list-style-type: none"> B. Administrative Concerns: <ul style="list-style-type: none"> 1. Breaks and punctuality 2. Location of coffee, tea, soda, candy/ vending machines 3. Cell phone policy 4. Message location and available telephones 5. Restrooms and drinking fountains 6. Other local concerns 	

OUTLINE	AIDS & CUES
<p>TAKE A BREAK APPROXIMATELY EVERY HOUR.</p> <p>PASS AROUND MASTER ROSTER SHEET AND HAVE STUDENTS MAKE ANY CORRECTIONS TO SPELLING OF THEIR NAME OR MAILING ADDRESS.</p> <p>DISTRIBUTE COPY OF CLASS ROSTER TO ANY RECEPTIONIST OR MESSAGE TAKER FOR INFORMATION PURPOSES.</p> <p>V. COURSE OVERVIEW</p> <p>A. This course was developed from the tasks outlined for Engine Boss in the Single Resource Boss Position Task Book.</p>	
<p>HAVE THE STUDENTS REFERENCE THEIR SINGLE RESOURCE BOSS PTB FOR AT THIS TIME.</p> <p>B. Reference Wildland and Prescribed Fire Qualification System Guide, PMS 310-1 and position description for single resource boss in the Fireline Handbook, 410-1 (FHB).</p> <p>Required training: Crew Boss (Single Resource), S-230 and Intermediate Wildland Fire Behavior, S-290</p> <p>Suggested training which supports development: Basic ICS, I-200; Engine Boss, S-231; Ignition Operations, S-234; Interagency Incident Business Management, S-260; Basic Air Operations, S-270</p>	<p>PTB, Single Resource Boss</p> <p>00-05-S231-EP PMS 310-1, FHB</p>

OUTLINE	AIDS & CUES
<p>THE TASKS LISTED IN THE FIRST SECTION ARE COMMON FOR ALL SINGLE RESOURCE BOSSES. STUDENTS DO NOT NEED TO BECOME QUALIFIED AS A CREW BOSS TO BECOME A QUALIFIED ENGINE BOSS, BUT THEY ARE REQUIRED TO COMPLETE THE FIRST SET OF TASKS COMMON TO ALL SINGLE RESOURCE BOSSES.</p> <p>C. Many of the administrative duties required of the Engine Boss are covered in the common section of the PTB and the S-230 Crew Boss course. These duties will not be addressed in this course unless necessary.</p> <p>INSTRUCTOR MAY WANT TO USE SOME EXAMPLES FROM THE COMMON SECTION OF THE POSITION TASK BOOK, I.E., ADMINISTRATIVE DUTIES SUCH AS: TIME SHEETS, CREW TIME REPORTS.</p> <p>D. Course references:</p> <ul style="list-style-type: none"> • Fireline Handbook • Incident Response Pocket Guide • Wildland Fire Suppression Tactics Reference Guide <p>TAKE SOME TIME TO ANSWER ANY QUESTIONS THE STUDENTS MAY HAVE HAD ON THE READING MATERIAL IN THE WILDLAND FIRE SUPPRESSION TACTICS REFERENCE GUIDE (WFSTRG).</p>	<p>FHB, IRPG, WFSTRG</p>

OUTLINE	AIDS & CUES
<p>VI. COURSE PROCESS</p> <p>A. This course consists of lecture material, simulated incident exercises, and situations that require the students to perform the duties of an Engine Boss both in the classroom and the field.</p> <p>B. Students will periodically work in small groups for interactive exercises and simulations.</p> <p>C. The instructor's role in this training is to: present information; facilitate the exercises; question students; present solutions to the simulated exercises and situations; and to answer student questions.</p> <p>D. This course is designed to emphasize the primary skills needed by an Engine Boss. It is not intended to cover every detail of the position.</p> <p>E. Discuss trainee job description for the engine boss.</p> <p>HAVE THE STUDENTS FORM INTO SMALL GROUPS. ASK THEM TO USE THE POSITION DESCRIPTION IN THE FIRELINE HANDBOOK (FHB) AND THE TASKS FOR ENGINE BOSS IN THE PTB TO COMPLETE THE FOLLOWING TASKS.</p> <p>Have students:</p> <ol style="list-style-type: none"> 1. Review the position description for single resource boss in the Fireline Handbook. 	<p>FHB</p>

OUTLINE	AIDS & CUES
<ol style="list-style-type: none"> 2. Compare the position description in the Fireline Handbook to the Engine Boss section of the Position Task Book for Single Resource Boss. 3. Develop a brief job description for the position of Engine Boss. 	<p>FHB PTB, Single Resource Boss</p>
<p>HAVE STUDENTS PUT THEIR JOB DESCRIPTION ON A FLIPCHART FOR PRESENTATION. THE FIRELINE HANDBOOK PROVIDES A GENERAL JOB DESCRIPTION WHILE THE PTB IS MORE DETAILED.</p>	<p>00-06-S231-EP</p>
<p>ALLOW 5 MINUTES AND HAVE THE STUDENTS PRESENT THEIR INTERPRETATION OF THE JOB DESCRIPTION. DISCUSS THE TWO DOCUMENTS. ANSWER ANY QUESTIONS THE STUDENTS MAY HAVE.</p>	
<p>NOTE THAT THE POSITION TASK BOOK FOR THE SINGLE RESOURCE BOSS IS INCLUDED FOR INSTRUCTIONAL PURPOSES.</p>	
<p>UTILIZE THE PTB TO ILLUSTRATE THE RESPONSIBILITIES OF THE JOB. IT IS NOT INCLUDED FOR THE PURPOSE OF INITIATING TASK BOOKS OR SIGNING OFF ON TASKS.</p>	
<p>UNITS SHOULD UTILIZE POLICIES IN PLACE FOR ADMINISTRATION OF THE TASK BOOKS.</p>	

OUTLINE	AIDS & CUES
<p>VII. EVALUATION</p> <p>A. Measuring Performance For This Course</p> <ol style="list-style-type: none"> 1. There are 31 questions on the final examination worth a total of 100 points. 2. Students must accumulate 70 percent, or 70 total points, on the final examination in order to receive credit for successfully completing this course. <p>B. Student Final Course Evaluation</p> <ol style="list-style-type: none"> 1. A tool used for analysis and future course improvements. 2. Must be completed by every student before they leave the training session. 	
<p>VIII. EXPECTATIONS</p> <p>A. Student Expectations Question</p> <p>What do you expect from this training session?</p> <p>HAVE EACH GROUP LIST THEIR EXPECTATIONS FOR THIS TRAINING SESSION.</p> <p>ALLOW THE STUDENT GROUPS 5-10 MINUTES TO COMPLETE THEIR LIST.</p> <p>EACH GROUP WILL NEED TO SELECT A SPOKESPERSON TO PRESENT EACH GROUP'S LIST.</p>	<p>00-07-S231-EP</p>

OUTLINE	AIDS & CUES
<p>B. Discuss Student Expectations</p> <p>The instructor cadre will need to:</p> <ol style="list-style-type: none"> 1. Determine which items can be achieved within the allotted class time. 2. Identify methods for achieving those hard to attain items. 3. Explain any difficulty encountered with the hard to achieve items. <p>THE STUDENT EXPECTATION LISTS AND THE ENGINE BOSS JOB DESCRIPTIONS DEVELOPED EARLIER, SHOULD BE POSTED AROUND THE CLASSROOM.</p> <p>REFER TO THESE LISTS THROUGHOUT THE TRAINING SESSION TO ENHANCE THE TRAINING.</p> <p>C. Present the instructors' expectations of the students for the course.</p> <p>The students will:</p> <ul style="list-style-type: none"> • Have an interest in becoming an Engine Boss. • Exhibit mutual cooperation with the group. • Participate actively in all exercises, simulations, and discussions in this course. • Be open minded to the materials presented during this training session. 	<p>00-08-S231-EP</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • Use what is presented in the course to perform as an Engine Boss. • Return to class at stated times. <p>THE LEAD INSTRUCTOR SHOULD NOTE THROUGHOUT THE TRAINING SESSION HOW STUDENT EXPECTATIONS WERE OR ARE BEING MET. BE PREPARED TO ADDRESS STUDENT EXPECTATION LISTS PRIOR TO CONCLUSION OF THE COURSE.</p> <p>REVIEW COURSE OBJECTIVES.</p>	<p>00-09-S231-EP</p>

DETAILED LESSON OUTLINE

COURSE: Engine Boss (Single Resource), S-231

UNIT: 1 - Engine and Crew Capabilities and Limitations

SUGGESTED TIME: 1 hour

TRAINING AIDS: Personal computer with LCD projector and presentation software or overhead projector; flipchart pads for each group, felt tip markers, masking tape or tacks.

OBJECTIVES: Upon completion of this unit, the student will be able to:

1. Identify engine capabilities and limitations that the Engine Boss must consider when deciding to attempt an assignment.
2. Describe assignments that require specialized training of engine crew members.
3. Describe the observations the Engine Boss must make of crewmembers to insure safety is not compromised.
4. Describe the criteria used to maintain the engine inventory.

OUTLINE	AIDS & CUES
PRESENT UNIT OBJECTIVES AND DISCUSS.	01-01-S231-EP
I. IDENTIFICATION OF ENGINE AND CREW CAPABILITIES AND LIMITATIONS	01-02-S231-EP
Ask the students:	
As an Engine Boss, what is the importance of knowing the capabilities and limitations of their:	01-03-S231-EP
<ul style="list-style-type: none"> • Engine • Assigned personnel (engine crew) 	
How do the capabilities and limitations of your engine and assigned personnel apply to any tactical assignments you may receive?	01-04-S231-EP
ASK STUDENTS TO PROVIDE EXAMPLES IF POSSIBLE.	
A. Engine Capabilities and Limitations	
Knowledge of engine's capability and limitations to complete an assignment.	
1. Terrain considerations	
2. Water capabilities	
<ul style="list-style-type: none"> • Pump size • Pump type • Drafting capabilities 	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • Tank size: <ul style="list-style-type: none"> - Enough water in tank? How much water to leave in reserve? - Ensure 1/4 tank reserve or 100 gallons are maintained • Vehicle weight limitations (GVW) • Foam capabilities, e.g., compressed air foam system, foam proportioner system <p>3. Maneuverability</p> <ul style="list-style-type: none"> • Experience of driver/operator is always a consideration. • 2wd/4wd vehicle • Spotter <p>4. Ability to get in and out (ingress/egress) of a given situation.</p> <p>5. Engine suited to stationary vs. mobile attack.</p> <ul style="list-style-type: none"> • Power take off (PTO) pump vs. auxiliary pump. What are the advantages/disadvantages of each system? 	

OUTLINE	AIDS & CUES
<p>6. Reliability - old vs. new.</p> <ul style="list-style-type: none"> • Regularly scheduled maintenance • Experienced operator with good troubleshooting skills for older equipment. <p>B. Engine Typing</p> <p>REFER THE STUDENTS TO APPENDIX A OF THE FIRELINE HANDBOOK (FHB) RESOURCE TYPING. ENGINE TYPING IS INCLUDED IN THIS SECTION. ADVISE THAT THIS PUBLICATION CAN BE USED AS A READY REFERENCE FOR TYPING AND IDENTIFYING THE CAPABILITIES OF VARIOUS ENGINES.</p> <p>INFORM THE STUDENTS THAT THIS CHART DISPLAYS MINIMUM STANDARDS. THE CAPABILITIES OUTLINED IN THE FHB CANNOT ALWAYS BE EASILY IDENTIFIED BY LOOKING AT INDIVIDUAL ENGINES. DISCUSS AS NEEDED.</p> <p>C. Crew Capabilities</p> <p>1. Will assignment exceed the experience and training level of the crew and/or supervisor (you) to safely complete the assignment?</p> <ul style="list-style-type: none"> • Wildland/Urban Interface, i.e., structure protection • Firing operations, e.g., burn out, backfire • Chainsaw operations • Identify any others 	<p>FHB</p>

OUTLINE	AIDS & CUES
<p>It is acceptable to refuse an assignment if it is beyond our level of expertise. It is your responsibility to know “when to say when.”</p> <p>2. Will the condition of your crew compromise safety?</p> <ul style="list-style-type: none"> • Fatigue • Sickness • Injuries • Attitude • Full PPE • Teamwork • Experience level • Crew fitness level <p>3. Assess the qualifications and capabilities of any unfamiliar crew member(s).</p> <p>Pre-planned assignments are highly recommended. Determining responsibilities during suppression activities can lead to confusion.</p> <p>D. Tactical Assignments</p>	
<p>1. Be aware of situations that exceed engine and crew capability to safely complete an assignment. Ensure the following are applied to your situation:</p> <ul style="list-style-type: none"> • Risk Management Process • Standard Firefighting Orders • Watch Out Situations • LCES Checklist • Downhill Checklist • Wildland/Urban Watch Outs • Others? 	<p>01-05-S231-EP</p> <p>IRPG, FHB</p>

OUTLINE	AIDS & CUES
<p data-bbox="386 285 1101 411">2. Will the condition and experience level of other engines and their personnel that you work with compromise your safety?</p> <p data-bbox="378 464 1127 590">The Engine Boss must communicate with adjacent resources to identify their capabilities and to coordinate their suppression efforts.</p> <p data-bbox="190 642 1065 852">WHAT WE ARE TEACHING HERE REQUIRES AN HONEST EVALUATION WITHOUT FEAR OF REPERCUSSION. IT IS IMPORTANT TO STRESS THAT BEING HONEST WITH YOURSELF AND OTHERS WILL KEEP PEOPLE SAFE.</p> <p data-bbox="190 909 1110 1077">DISCUSS EXAMPLES OF AGENCY TURN-DOWN POLICIES. REFERENCE THE INCIDENT RESPONSE POCKET GUIDE, “HOW TO PROPERLY REFUSE RISK”.</p> <p data-bbox="190 1134 899 1167">II. MAINTAINING ENGINE INVENTORY</p> <p data-bbox="190 1220 1133 1430">ASK THE STUDENTS WHAT METHODS THEY UTILIZE TO MAINTAIN ENGINE INVENTORY. COMPARE METHODS OF DIFFERENT AGENCIES IF MORE THAN ONE AGENCY IS REPRESENTED AT THE TRAINING SESSION.</p> <p data-bbox="285 1486 712 1520">A. Pre-Incident Inventory</p> <ol data-bbox="386 1577 1133 1915" style="list-style-type: none"> <li data-bbox="386 1577 1049 1654">1. Determine method for maintaining pre-incident engine inventory. <li data-bbox="386 1711 1133 1915">2. A written inventory should be maintained on your engine at all times. <ul data-bbox="477 1843 1053 1915" style="list-style-type: none"> <li data-bbox="477 1843 1053 1915">• Facilitates replacing of expended items. 	<p data-bbox="1154 909 1243 942">IRPG</p> <p data-bbox="1154 1134 1382 1167">01-06-S231-EP</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • Maintains mobility and ability for reassignment (readiness). <p>3. If you have not established a method then do so.</p> <p>REFER TO THE EXAMPLE OF THE ENGINE INVENTORY LIST AND DISCUSS.</p> <p>EXPLAIN THIS INVENTORY LIST IS ONE EXAMPLE; A LOCALIZED INVENTORY LIST MAY BE USED IN PLACE OF THIS EXAMPLE.</p> <p>DISCUSS THE IMPORTANCE OF MAINTAINING AN INVENTORY ON THE ENGINE FOR RE-SUPPLYING EITHER AT THE INCIDENT OR BACK AT THE HOME UNIT.</p> <p>B. Maintaining Inventory During Incident Operations</p> <ol style="list-style-type: none"> 1. Inventory should be maintained and replenished on a daily basis if possible. 2. Utilize supervisor or the chain of command to replenish supplies on incident. <ul style="list-style-type: none"> • If unable to replenish on the incident, a list of items to be replenished must be signed by the Incident Commander or designee. • Notify immediate supervisor of lost or damaged items. 	<p>01-01-S231-IR SW p. 1.6-1.9</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • Inspect engine before leaving the incident documenting all damages. Have the immediate supervisor sign this documentation to allow the repair of these damages to be charged to the incident. <p>HAVE THE STUDENTS IDENTIFY WHO THEIR SUPERVISOR MAY BE IN VARIOUS SITUATIONS. ON A LARGE FIRE IT MAY BE A DIVISION/GROUP SUPERVISOR, STRIKE TEAM OR TASK FORCE LEADER. ON A SMALL FIRE THEY MAY WORK DIRECTLY UNDER THE INCIDENT COMMANDER. DISCUSS AS NEEDED.</p> <ol style="list-style-type: none"> 3. Attempt to maintain engine in a state of full readiness. Report any difficulties encountered when attempting to restock to your immediate supervisor. <p>C. Utilization of Hose and Appliances</p> <ol style="list-style-type: none"> 1. Engine hose and appliances should be utilized from first responding engine. As additional hose and appliances are needed, strip the second and then third responding engines as the situation requires. 2. Maintain mobility of engines that do not need to be stripped of inventory. 3. Consider utilizing hose and appliances of first responding engine of agency with jurisdictional responsibility. 	

OUTLINE	AIDS & CUES
<p>4. The key is to maintain mobility of as many engines as possible while still conducting suppression activities.</p> <p>D. Demobilization/Post-Incident Inventory Re-supply.</p> <p>1. Utilizing a listing of pre-incident inventory, replenish expended engine supplies prior to release if possible.</p> <p>2. If not, procure appropriate order to replenish at the home unit. Obtain signature of IC or designee.</p> <p>3. Always depart an incident ready for reassignment.</p> <p>4. Post incident maintenance</p> <ul style="list-style-type: none"> • Check air filters • Steam clean engine (for noxious weed seeds) 	
<p>III. DAILY ENGINE MAINTENANCE</p> <ul style="list-style-type: none"> • Daily checklist • Preventative maintenance checks • Maintenance schedule and records 	<p>01-07-S231-EP</p> <p>01-02-S231-IR SW p. 1.11</p>
<p>REVIEW THE UNIT OBJECTIVES AND DISCUSS.</p>	<p>01-08-S231-EP</p>

Engine Inventory, example

Category	Item Description	NFES #	Type	
			3, 4 & 5	6
Fire Tools & Equip.	McLeod	0296	1	
	Combination Tool	0346	1	1
	Shovel	0171	3	2
	Pulaski	0146	3	2
	Backpack Pump	1149	3	2
	Fusees (case)	0105	1	½
	Foam, concentrate, Class A (5-gallon)	1145	1	1
	Chain Saw (and chaps)		1	1
	Chain Saw Tool Kit	0342	1	1
	Drip Torch	0241	2	1
	Portable Pump		*	*
Medical	First Aid Kit, 10-person	0068	1	1
	Burn Kit		1	1
	Body Fluids Barrier Kit	0640	1	1
General Supplies	Flashlight, general service	0069	1	1
	Chock Blocks		1	1
	Tow Chain or Cable	1856	1	1
	Jack, hydraulic (comply w/ GWV)		1	1
	Lug Wrench		1	1
	Pliers, fence		1	1
	Food (48-hour supply)	1842	1	1
	Rags	3309	*	*
	Rope/Cord (feet)		50	50
	Sheeting, plastic, 10' x 20'	1287	1	1
	Tape, Duct	0071	1	1
	Tape, filament (roll)	0222	2	2
	Water (gallon/person) minimum		2	2
	Bolt Cutters		1	1
	Toilet Paper (roll)	0142	*	*
	Cooler or Ice Chest	0557	*	*
	Hand Primer, Mark III	0145	*	*
	Hose Clamp	0046	2	1
	Gaskets (set)		1	1
Pail, collapsible	0141	1	1	
Hose Reel Crank		*	*	
Safety	Fire Extinguisher (5 lb)	2143	1	1
	Flagging, Hot Pink (roll)	0566	*	*

Engine Inventory, example

Category	Item Description	NFES #	Type	
			3, 4 & 5	6
	Flagging, yellow w/black stripes (roll)	0267	*	*
	Fuel safety can (OSHA, metal, 5-gallon)	1291	*	*
	Reflector Set		*	*
Vehicle & Pump Support	General Tool Kit (5180-00-177-7033/GSA)		1	1
	Oil, automotive, quart		4	2
	Oil, penetrating, can		1	1
	Oil, automatic transmission, quart		1	1
	Brake Fluid, pint		1	1
	Filter, gas		1	1
	Fan belts		1	1
	Spark plugs		1	1
	Hose, air compressor w / adapters		1	0
	Fuses (set)		1	1
	Tire Pressure Gauge		1	1
	Jumper Cables		1	1
	Battery Terminal Cleaner		*	*
	Tape, electrical, plastic	0619	1	1
Tape, Teflon		1	1	
Personal Gear (Extra Supply)	File, mill, bastard	0060	*	*
	Head Lamp	0713	1	1
	Hard Hat	0109	1	1
	Goggles	1024	2	2
	Gloves		*	*
	First Aid Kit, individual	0067	1	1
	Fire Shirt		*	*
	Fire Shelter w/ case & liner	0169	2	1
	Packsack	0744	2	1
	Batteries, headlamp (pkg)	0030	6	4
	Ear Plugs (pair)	1027	3	3
	Dust Mask	0131	6	4
Radio	Portable		1	1
	Mobile		1	1
	Batteries (for portable radio)		2	2
Hose	Booster (feet/reel)	1220	100	100
	Suction (length, 8' or 10')		2	2
	1" NPSH (feet)	0966	300	300
	1½" NH (feet)	0967	300	300
	¾" NH, garden (feet)	1016	300	300
	1½" NH, engine protection(feet)		20	20

Engine Inventory, example

Category	Item Description	NFES #	Type	
			3, 4 & 5	6
	1½" NH, refill (feet)		15	15
Nozzle	Forester, 1" NPSH	0024	3	2
	Adjustable, 1" NPSH	0138	4	2
	Adjustable, 1½" NH	0137	5	3
	Adjustable, ¾" NH	0136	4	2
	Foam, ¾" NH	0627	1	1
	Foam, 1½" NH	0628	1	1
	Mopup Wand	0720	2	1
	Tip, Mopup Wand	0735	4	2
	Tip, forester nozzle, fog	0903	*	*
	Tip, forester nozzle, straight stream	0638	*	*
Wye	1" NPSH, Two-Way, Gated	0259	2	1
	1½" NH, Two-Way, Gated	0231	4	2
	¾" NH w/ Ball Valve, Gated	0739	6	4
Adapter	1" NPSH-F to 1" NH-M	0003	*	*
	1" NH-F to 1" NPSH-M	0004	1	1
	1½" NPSH-F to 1½" NH-M	0007	1	1
	1½" NH-F to 1½" NPSH-M	0006	*	*
Increaser	¾" NH-F to 1" NPSH-M	2235	1	1
	1" NPSH-F to 1½" NH-M	0416	2	1
Coupling	1" NPSH, Double Female	0710	1	1
	1" NPSH, Double Male	0916	1	1
	1½" NH, Double Female	0857	2	2
	1½" NH, Double Male	0856	1	1
Reducer/ Adapter	1" NPSH-F to ¾" NH-M	0733	3	3
	1½" NH-F to 1" NPSH-M	0010	6	4
	2" NPSH-F to 1½" NH-M	0417	*	*
	2½" NPSH-F to 1½" NH-M	2229	*	*
Reducer	1½" NH-F to 1" NH-M	0009	1	1
	2.5" NH-F to 1½" NH-M	2230	1	1
Tee	1"NPSH-F x 1" NPSH-M x 1" NPSH-M, w/cap	2240	2	2
	1½" NH-F x 1½" NH-M x 1" NPSH-M w/cap	0731	2	2
	1½" NH-F x 1½" NH-M x 1" NPSH-M w/valve	0230	2	2
Valve	1½" NH-F, Automatic Check and Bleeder	0228	1	1
	¾" NH, Shut Off	0738	5	5
	1", Shut Off	1201	1	1
	1½", Shut Off	1207	1	1
	Foot, w/ strainer		1	1
Ejector	1" NPSH x 1½" NH x 1½" NH, Jet Refill	7429	*	*

Engine Inventory, example

Category	Item Description	NFES #	Type	
			3, 4 & 5	6
Wrench	Hydrant, adjustable, 8"	0688	1	1
	Spanner, 5", 1" to 1½" hose size	0234	4	1
	Spanner, 11", 1½" to 2½" hose size	0235	2	2
	Pipe, 14"	0934	1	1
	Pipe, 20"		1	1
Engine	<i>Fireline Handbook</i>	0065	1	1
	Belt Weather Kit	1050	1	1
	Binoculars		1	1
	Map Case w / maps		1	1
	Inventory List		1	1
	<i>Standards For Fire and Aviation Operations</i>		1	1
*No minimums – carried by engines as an option, within weight limitations				

Daily Checklist, example

Property #	Engine #	License #							
			Su	Mo	Tu	We	Th	Fr	Sa
Walk around vehicle and check for damage									
Inspect tires for uneven wear/damage and proper inflation									
Check the undercarriage for damage and loose belts									
Check slack adjusters/ individual wheel brake drum									
Inspect battery for loose connections and corrosion									
Inspect air filter									
Check belts and hoses for tension and wear									
Check engine oil level									
Check coolant level									
Check power steering fluid level									
Check wiper fluid level and operation									
Check air compressor									
Check headlights, turn indicator, reverse, and overhead lights									
Check air brake system (leaks)									
Check low air pressure warning beeper									
Check automatic parking brake deployment									
Check horn operation									
Check proper radio operation									
Complete inventory check every Sunday or after any fire									
Wash/clean engine (every two weeks or after fire/field assignment)									
Check water level in tank									
Check valves for proper operation									
Check for PTO engagement/disengagement									
Check gauges									
Pressure check plumbing for leaks									
Check overboard discharge for all valves									
Check primer pump oil level									
Perform drafting operation									
Comments:			Needs:						

DETAILED LESSON OUTLINE

COURSE: Engine Boss (Single Resource), S-231

UNIT: 2 - Information Sources

SUGGESTED TIME: 1 Hour

TRAINING AIDS: Personal computer with LCD projector and presentation software or overhead projector; flipcharts, felt tip markers.

OBJECTIVES: Upon completion of this unit, the student will be able to:

1. Identify sources of information needed to complete tactical assignment.
2. Describe the coordination required to accomplish tactical assignment.

OUTLINE	AIDS & CUES
<p>PRESENT UNIT OBJECTIVES AND DISCUSS.</p> <p>I. INFORMATION SOURCES</p> <p>The Engine Boss is responsible for gathering all the information necessary to accomplish their tactical assignment. Once a clear picture of the assignment is known the Engine Boss must then pass this information to their assigned personnel.</p> <p>The information sources include, but are not limited to:</p> <ul style="list-style-type: none">• Your fireline supervisor• Other Engine Bosses and crews• Other members of a task force/strike team that you may be assigned to.	<p>02-01-S231-EP 02-02-S231-EP</p> <p>02-03-S231-EP</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • Air resources, e.g., air tactical group supervisor (ATGS), helitack. • Incident Action Plan (IAP) • Local knowledge • Prescribed fire plan, if applicable <p>DISCUSS OTHER POSSIBLE SOURCES.</p> <p>II. BRIEFINGS</p> <p>A. The Engine Boss' primary source of information is supervisor briefing. Your briefing on your assignment should come from your immediate supervisor.</p> <p>Depending on the size complexity of the incident the Engine Boss may receive briefings from one or a combination of the following sources:</p> <ul style="list-style-type: none"> • Incident commander • Planning section chief • Division group supervisor • Task force leader • Strike team leader • Operations section chief • Staging area manager • Engine Boss being relieved • Handcrews and other fireline resources <p>ASK THE STUDENTS TO IDENTIFY UNDER WHAT CIRCUMSTANCES THEY MAY RECEIVE BRIEFINGS FROM THESE SOURCES. PROVIDE YOUR OWN EXAMPLES AS NEEDED.</p>	<p>02-04-S231-EP</p>

OUTLINE	AIDS & CUES
<p>PRESENT EXERCISE TO COVER THE INFORMATION THAT THE ENGINE BOSS SHOULD RECEIVE IN A BRIEFING FROM THEIR SUPERVISOR.</p>	<p>02-01-S231-IR SW p. 2.9 02-05-S231-EP</p>
<p>DISCUSS AGENCY SPECIFIC BRIEFING POLICIES.</p>	<p>IRPG</p>
<p>B. Supervisor Briefing—Essential Information</p>	
<p>1. Situation</p>	
<ul style="list-style-type: none"> • Fire name, location, map orientation, other incidents in area • Terrain influences • Fuel type and conditions • Fire weather (previous, current, and expected); wind, relative humidity, temperature, etc. • Fire behavior (previous, current, and expected); time of day, alignment of slope and wind, etc. 	
<p>2. Mission/Execution</p>	
<ul style="list-style-type: none"> • Command; Incident Commander/ immediate supervisor • Commander’s intent; overall strategy/ objectives • Specific tactical assignments • Contingency plans 	
<p>3. Communications</p>	
<ul style="list-style-type: none"> • Communication plan; tactical, command, air-to-ground frequencies, cell phone numbers • Medevac plan 	

OUTLINE	AIDS & CUES
<p>4. Service/Support</p> <ul style="list-style-type: none"> • Other resources; working adjacent and those available to order, aviation operations • Logistics; transportation, supplies and equipment <p>5. Risk Management</p> <ul style="list-style-type: none"> • Identify known hazards and risks • Identify control measures to eliminate hazards/reduce risk; anchor point and LCES • Identify trigger points for disengagement/reevaluation of operational plan. <p>Questions or Concerns?</p> <p>THE INSTRUCTOR MAY WANT TO PROVIDE THE STUDENTS WITH A LIST OF LOCAL FREQUENCIES USED.</p> <p>6. Any special or additional items of equipment that assigned personnel must take to the line.</p> <p>7. Any special equipment that you may have assigned to your operation:</p> <ul style="list-style-type: none"> • Firing equipment • Water tenders 	

OUTLINE	AIDS & CUES
<ol style="list-style-type: none"> 8. Fueling requirements, availability and location. 9. Maintenance requirements and how to obtain a mechanic if one is needed on the line. 10. An indication of engine crew work performance during past operational periods. 11. Whom to report to on the line. 	
<p>HAVE STUDENTS REFER TO THE BRIEFING INFORMATION IN THE FIRELINE HANDBOOK AND THE INCIDENT POCKET RESPONSE GUIDE.</p>	
<p>C. Other Incident Personnel</p> <p>Most information will come from the fireline supervisor. It is important to maintain communication with all fireline personnel to gather the most current and accurate information.</p> <p>The Engine Boss should also inquire of other incident personnel what their experience is with the current incident, such as:</p> <ol style="list-style-type: none"> 1. Size of fire 2. Complexity of fire (project or initial attack) 3. Phase of fire (initial attack, suppression and mopup) 	<p>02-06-S231-EP</p>

OUTLINE	AIDS & CUES
<p>4. Attack methods that have been used. Methods that have been successful.</p> <ul style="list-style-type: none"> • Direct attack • Indirect attack • Parallel attack • Others <p>5. Fire behavior</p> <ul style="list-style-type: none"> • Fuel conditions in area assigned • Weather phenomena of the area • Fighting fire where interplay of fuels, weather, and topography create special or unusual burning conditions • Experience with geographic hazards associated with engine attack <p>6. Equipment</p> <ul style="list-style-type: none"> • What combinations of resources have been successful. • Ability to work in coordination with other engines/resources. 	
<p>EXPLAIN THAT THESE ARE THE INITIAL PRIMARY SOURCES OF INFORMATION AVAILABLE TO THE ENGINE BOSS. OTHER FIRELINE INDICATORS WILL BE COVERED MORE IN DEPTH IN UNIT 4.</p>	

OUTLINE	AIDS & CUES
<p>D. Subordinate Briefing</p> <p>After the Engine Boss has determined their assignment, assigned personnel must be informed of their duties.</p> <p>Clarify the chain of command and give the subordinates a clear idea of how their efforts fit into the suppression effort.</p> <p>INITIATE A DISCUSSION WITH THE STUDENTS ON WHAT BRIEFING INFORMATION IS IMPORTANT FOR THE ENGINE BOSS TO GIVE TO THEIR ASSIGNED PERSONNEL.</p> <p>When briefing your assigned personnel, it is important to include:</p> <ol style="list-style-type: none"> 1. Any and all information which allows them to safely and efficiently accomplish their assigned tasks, e.g., ICS 203, Organization Assignment list in the IAP. 2. Take crew to morning briefing if applicable. <p>THE FOLLOWING LIST WILL PROVIDE THE INSTRUCTOR WITH A CHECKLIST FOR THIS DISCUSSION.</p> <ol style="list-style-type: none"> 3. Discuss the chain of command. 4. Discuss safety issues: <ul style="list-style-type: none"> • Standard Firefighting Orders • Watch Out Situations • LCES 	<p>02-07-S231-EP</p> <p>02-08-S231-EP</p>

OUTLINE	AIDS & CUES
<p>5. Work assignment:</p> <ul style="list-style-type: none"> a. Other engines b. Hand crews c. Specialty crews <ul style="list-style-type: none"> • Felling teams • Dozer operations • Pump teams (portable pumps) • Firing teams (backfire or burnout) <p>6. What support is necessary?</p> <ul style="list-style-type: none"> a. Water tenders <ul style="list-style-type: none"> • Portable pump locations, Fol-da-tanks®, etc. b. Retardant base c. Routine or emergency maintenance <p>7. Communications to be used:</p> <ul style="list-style-type: none"> a. Engine to engine and/or adjoining forces b. Engine to overhead (using chain of command) c. Engine to aircraft (using chain of command) 	

OUTLINE	AIDS & CUES
<p>III. COORDINATION</p> <p>It is essential that all fire suppression activities be coordinated and that communications are established and maintained.</p> <p>ASK THE STUDENTS TO DISCUSS WHY EACH OF THE FOLLOWING TWO TOPICS IS IMPORTANT TO THEM AND THEIR ASSIGNED PERSONNEL.</p>	02-09-S231-EP
<p>A. Establishing and Maintaining Communications</p> <p>What is the importance of establishing and maintaining communications?</p> <ol style="list-style-type: none"> 1. One of the essential components of LCES. 2. Any changes in fire behavior, activity can be monitored. 3. Any activities by adjacent forces, division/ groups that may compromise safety can be monitored. <ul style="list-style-type: none"> • Air attack • Air operations • Burnout/backfire operations 	02-10-S231-EP
<p>B. Coordination With Adjoining Forces</p> <p>Why is coordination with adjoining forces important during fireline activities?</p> <ul style="list-style-type: none"> • Keep current with the overall mission 	02-11-S231-EP

OUTLINE	AIDS & CUES
<p>What are methods for implementation?</p> <p>ASK THE STUDENTS TO DISCUSS THE IMPORTANCE OF COORDINATION AND HOW THEY HAVE OR MAY IMPLEMENT THIS.</p> <ol style="list-style-type: none"> 1. May be required to support adjacent forces, division/groups. 2. May provide support to other operations on the fire. <ul style="list-style-type: none"> • Burnout/backfire operation • Staged for protection of structures, improvements or other critical areas • Filling stock tanks, Fol-da-tanks®, or sumps • Wetting down helispots or helibases for dust abatement • Filling helitankers with water or retardant • Providing exposure protection to personnel, equipment, and structures • Supporting and patrolling for other fireline operations • Any others? <p>REVIEW UNIT OBJECTIVES AND DISCUSS.</p>	
	02-12-S231-EP

S-231 Unit 2
EXERCISE

DIVIDE STUDENTS INTO GROUPS OF 3-6 STUDENTS.

THE INSTRUCTOR SHOULD PRESENT THE FOLLOWING INFORMATION:

You are all Engine Bosses. This is your first operational period.

Prepare a response for the following question:

What kind of information would you want from your fireline supervisor?

- **ALLOW THE STUDENTS 5-10 MINUTES TO DEVELOP A GROUP LIST.**
- **MOVE FROM GROUP TO GROUP AND ASK FOR ONE ITEM AT A TIME.**
- **LIST THE ITEMS AS THE STUDENTS PRESENT THEM. STUDENTS SHOULD BE ABLE TO DISCUSS WHY THIS INFORMATION IS IMPORTANT TO THEM AS ENGINE BOSSES AND HOW THE INFORMATION WOULD BE UTILIZED.**
- **ALLOW FOR DISCUSSION AS THE LIST DEVELOPS.**
- **REFER TO THE INCIDENT POCKET RESPONSE GUIDE, IRPG BACK COVER FOR A BRIEFING CHECKLIST. A COPY OF THIS CHECKLIST IS ALSO INCLUDED IN THE STUDENT WORKBOOK.**

DETAILED LESSON OUTLINE

COURSE: Engine Boss (Single Resource), S-231

UNIT: 3 - Fire Sizeup Considerations

SUGGESTED TIME: 1.5 Hours

TRAINING AIDS: Personal computer with LCD projector and presentation software or overhead projector; flipcharts, felt tip markers.

OBJECTIVES: Upon completion of this unit, the student will be able to:

1. Describe the sizeup elements in a fire situation.
2. Identify the four fuel groups and describe expected fire behavior in each.
3. Determine the tactics to be used after sizeup occurs.

OUTLINE	AIDS & CUES
<p>PRESENT THE UNIT OBJECTIVES.</p> <p>I. SIZEUP ELEMENTS</p> <p>The Engine Boss, when given an assignment by their supervisor, must decide which method of attack must be utilized to effectively complete the assignment.</p> <p>There are three methods of attack; direct, parallel, and indirect. Various tactics can be used in each of these methods and these will be discussed in Tactics, Unit 4.</p> <p>To ensure safety, firefighters must be familiar with the factors needed to effectively size up the fire. This will enable you to select the appropriate tactics with the available resources.</p>	<p>03-01-S231-EP 03-02-S231-EP</p>

OUTLINE	AIDS & CUES
<p>REFERENCE FIRELINE HANDBOOK, “INITIAL ATTACK, ARRIVING AT THE FIRE” AND THE INCIDENT RESPONSE POCKET GUIDE, “SIZE UP REPORT”.</p>	FHB, IRPG
<p>En route to a fire think about your knowledge of the fire area. The following must be observed and considered:</p>	03-03-S231-EP
<p>CONSIDER ASKING THE STUDENTS TO IDENTIFY THESE FACTORS RATHER THAN SIMPLY LISTING THEM.</p>	
<ul style="list-style-type: none"> A. Fuels and terrain B. Fire behavior potential C. Current and predicted weather D. Smoke column; color and density E. Access roads F. Possible water sources G. Jurisdiction, i.e., protecting agency H. Fire history of the area 	
<p>Obtain local pocket cards of the area for critical thresholds for fire behavior such as energy release component or burning index. These are posted on the National Fire Danger Rating Working Team site at http://famweb.nwcg.gov/pocketcards/</p>	

OUTLINE	AIDS & CUES
<p>THE INFORMATION ABOVE CAN BE REFERENCED IN THE FHB UNDER INITIAL ATTACK SECTION, “EN ROUTE TO THE FIRE.” ASK THE STUDENTS TO IDENTIFY WHAT SPECIAL CONCERNS ACCESS/ EGRESS AND PARKING MAY PRESENT TO THE ENGINE BOSS.</p> <p>I. Parking</p> <ul style="list-style-type: none"> • Will parking obstruct the traffic flow? • Will parking problems inhibit your ability to access/egress escape routes? • Has proximity to oncoming fire been considered? • Can a parking area be constructed, e.g., felling trees, blading? <p>J. Observe vehicles coming and going for investigation purposes.</p>	<p>FHB</p>
<p>INFORMATION ON “ENGINE OPERATIONS” AND “MANAGING VEHICLE TRAFFIC IN SEVERE SMOKE” CAN BE FOUND IN THE FIREFIGHTER SAFETY SECTION OF THE FIRELINE HANDBOOK.</p> <p>II. FUEL GROUPS AND EXPECTED FIRE BEHAVIOR</p> <p>Fuel groups - Fuels vary in type from one area of the country to another and within the same area. Fuels can be classified into four major groups:</p> <p>REALIZING THAT THERE ARE NO ABSOLUTE ANSWERS, ASK THE STUDENTS FOR EXAMPLES OF ENGINES THEY WOULD RECOMMEND USING FOR THE INDIVIDUAL FUEL GROUPS AND WHY.</p>	<p>FHB</p>

OUTLINE	AIDS & CUES
<p>THE FOLLOWING MATERIAL SHOULD BE A REVIEW OF EXPECTED FIRE BEHAVIOR IN THE DIFFERENT FUEL GROUPS FOR THE STUDENTS. THIS MATERIAL IS INTENDED TO PREPARE THE STUDENTS FOR THE SECTIONS ON TACTICS AND SAFETY.</p>	
<p>STUDENTS ARE RESPONSIBLE FOR KNOWLEDGE OF THE FOUR FUEL GROUPS (S-290) AT THIS POINT IN THEIR TRAINING. INSTRUCTOR SHOULD BE AWARE OF THIS IF REFERENCE IS MADE TO THE FUEL MODELS.</p>	
<p>THE STUDENTS MAY WANT TO UTILIZE THE INFORMATION ON THE FUEL GROUPS IN APPENDIX B OF THE FIRELINE HANDBOOK FOR THE FOLLOWING EXERCISE.</p>	<p>FHB, Appendix B</p>
<p>ADMINISTER EXERCISE 1.</p>	<p>03-01-S231-IR SW p. 3.9 03-04-S231-EP</p>
<p>SHOW STUDENTS SLIDES OF THE FOUR FUEL GROUPS FOR A VISUAL REFERENCE.</p>	<p>03-05-S231-EP thru 03-16-S231-EP</p>
<p>ALLOW EACH GROUP 10 MINUTES TO DEVELOP THEIR LISTS. A SPOKESPERSON FOR EACH GROUP WILL PRESENT THEIR INFORMATION.</p>	<p>03-17-S231-EP</p>
<p>USE THE GROUP PRESENTATIONS AND DISCUSSION TO COVER THE INFORMATION ON FUEL GROUPS FOLLOWING THIS EXERCISE.</p>	

OUTLINE	AIDS & CUES
<p>WHEN VIEWING THE SLIDES IN THE FOLLOWING INSTRUCTIONAL MATERIAL, CONSIDER ASKING THE STUDENTS:</p> <ul style="list-style-type: none"> • WHAT FUEL GROUPS ARE DEPICTED? • WHAT TYPES OF TACTICS CAN BE UTILIZED? • IN WHAT AREA(S) OF THE COUNTRY CAN THEY EXPECT TO FIND THAT FUEL GROUP? <p>INCLUDE DISCUSSION ON THE CHARACTERISTICS OF THE FUEL GROUPS IN AREAS OF THE COUNTRY THAT THE STUDENTS MAY NOT HAVE HAD EXPERIENCE IN.</p> <p>A. Grass Group - Found in most areas, but more dominant as a fuel in desert and range areas. It can become prevalent after a prescribed fire in forested areas.</p> <ol style="list-style-type: none"> 1. Has moderate to high spread and low to moderate fireline intensity (flame length). 2. Reacts very quickly to water and additives. 3. Doesn't require as much mopup as in the other three fuel groups. 4. Short duration of heat and flame 5. Engine types 3-7 are most effective. 6. Direct mobile attack is effective. 	<p>03-18-S231-EP</p>

OUTLINE	AIDS & CUES
<p>B. Shrub Group - Found throughout most geographical areas. Some dangerous shrub fuels are palmetto/gallberry in the Southeast, sagebrush in the Great Basin, and chaparral in the Southwest and West.</p> <ol style="list-style-type: none"> 1. Moderate to high rate of spread and moderate to high fireline intensity (flame length) 2. Reaction to water and additives is moderate to high depending on fireline intensity. 3. Low to moderate mopup time needed. 4. Short duration of heat and flame 5. Engine types 3-7 are most effective. Support with water tenders. 6. Direct mobile attack is effective depending upon fireline intensity. <p>C. Timber Litter Group - Most dominant in mountainous topography, especially in the Northwest.</p> <ol style="list-style-type: none"> 1. Low to moderate rate of spread and low to high fireline intensity (flame length) 2. Water and additives effectively reduce rate of spread. 3. Usually requires more mopup than the grass and shrub fuel groups. Mopup time can be considerable with deep timber litter. 	

OUTLINE	AIDS & CUES
<ol style="list-style-type: none"> 4. Longer duration of heat and flames than the grass and shrub groups, especially if the litter is deep. 5. Engine types 3-7 are most effective. Support with water tenders. 6. Direct mobile attack with engines may be effective depending on fireline intensity and terrain. Indirect attack and burnout operations are also effective. 	
<p>GENERATE DISCUSSION ON THE TYPE OF ATTACK THAT WOULD BE EFFECTIVE IN THE TIMBER LITTER FUEL GROUP.</p>	
<p>UTILIZE EXPERIENCES FROM STUDENTS REPRESENTING DIFFERENT AGENCIES AND/OR WITH EXPERIENCE ON DIFFERENT ENGINE TYPES.</p>	
<ol style="list-style-type: none"> D. Logging Slash Group - Debris left after logging, pruning, thinning, or shrub cutting. It may include logs, chunks, bark, branches, stumps, and broken understory trees or shrubs. <ol style="list-style-type: none"> 1. Low to high rate of spread and low to very high fireline intensity (flame length) 2. Water and additives may react slowest in this fuel group. 3. Requires the most mopup of the four fuel groups. 4. Long duration of heat and flame. 	

OUTLINE	AIDS & CUES
<p>5. Engine types 3-7 are most effective. Support with water tenders.</p> <p>6. Both indirect/direct attack can be effective. Direct attack with engines is usually not possible because of fuel loading.</p>	
<p>ASK THE STUDENTS WHAT ALTERNATIVES THEY MAY HAVE IN THE ABOVE SITUATIONS. BE PREPARED TO DISCUSS STATIONARY VS. MOBILE ATTACK. WHAT DECISIONS ARE TO MADE WITHIN THE ROLE OF THE ENGB?</p>	
<p>III. ARRIVAL ON THE FIRE SCENE</p>	03-19-S231-EP
<p>A. Correct tactical decisions always provide for safety first:</p> <ul style="list-style-type: none"> • Risk Management Process • Standard Firefighting Orders • Watch Out Situations • LCES Checklist • Wildland/Urban Watch Outs • Downhill Checklist 	
<p>B. Decisions to be made:</p> <ul style="list-style-type: none"> • How to implement LCES • How to attack the fire (direct, parallel, indirect) • Where to attack (rear, flanks, head) • Location of control line (natural barriers, private land, riparian and sensitive areas, wilderness study areas, archeological sites) • Type of control line (width, burnout) 	03-20-S231-EP IRPG

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • How to work with other available resources to accomplish objectives. Are resources sufficient ? • Anchor point • Resources threatened 	
<p>REFER STUDENTS TO THE FHB, “ INITIAL ATTACK SAFETY CHECKLIST”</p>	<p>FHB</p>
<p>ADMINISTER EXERCISE 2.</p>	<p>03-02-S231-IR SW p. 3.11</p>
<p>ALLOW THE STUDENTS 5-10 MINUTES FOR INDIVIDUAL GROUP DISCUSSION AND TO LIST THEIR RESPONSES.</p>	<p>03-21-S231-EP</p>
<p>HAVE EACH GROUP APPOINT A SPOKESPERSON TO PRESENT THEIR RESPONSES.</p>	<p>03-22-S231-EP</p>
<p>RESPONSES MAY VARY. ENSURE THAT STUDENTS UNDERSTAND HOW TO IMPLEMENT LCES. REFER STUDENTS TO THE IRPG, “LCES CHECKLIST”.</p>	<p>IRPG</p>
<p>BE PREPARED TO FACILITATE A DISCUSSION ON ALL FOUR ASPECTS OF LCES WITH ENTIRE STUDENT GROUP.</p>	
<p>C. Other factors that affect decision making:</p> <ul style="list-style-type: none"> • Size of fire • Fire environment • Location of the fire head • Time of the day • Values/resources at risk 	<p>03-23-S231-EP</p>

OUTLINE	AIDS & CUES
<p>D. Relay the information:</p> <ul style="list-style-type: none"> • Relay information to the local dispatch office, command center, fireline supervisor, adjoining forces, crewmembers. • Remain in communication with the above contacts, e.g., adjoining forces, fireline supervisor. • This process will help validate what you are thinking. 	
<p>ADDITIONAL INFORMATION CAN BE FOUND IN THE FHB, “EVALUATE INITIAL ATTACK PLAN”.</p>	<p>FHB</p>
<p>ADMINISTER EXERCISE 3.</p>	<p>03-03-S231-IR SW p. 3.13 - 3.15</p>
<p>ALLOW TEN MINUTES FOR INDIVIDUAL GROUP DISCUSSION AND PREPARATION OF THE GROUP LISTS.</p>	<p>03-24-S231-EP</p>
<p>EACH GROUP WILL NEED TO SELECT A SPOKESPERSON TO PRESENT THEIR INFORMATION. EACH GROUP WILL PRESENT THEIR INFORMATION ONE GROUP AT A TIME.</p>	<p>03-25-S231-EP</p>
<p>FACILITATE DISCUSSION WITH ALL GROUPS AT THE CONCLUSION OF EACH PRESENTATION, AS NEEDED.</p>	
<p>REVIEW “SIZEUP CONSIDERATIONS FOR THE FOLLOWING KEY FACTORS” AT THE CONCLUSION OF THE DISCUSSION.</p>	
<p>REVIEW UNIT OBJECTIVES AND DISCUSS.</p>	<p>03-26-S231-EP</p>

Unit 3
Exercise 1

DIVIDE THE STUDENTS INTO FOUR GROUPS. ASSIGN ONE OF THE FOUR FUEL GROUPS TO EACH GROUP OF STUDENTS.

IF THERE ARE MORE THAN FOUR GROUPS OF STUDENTS, THEN MORE THAN ONE GROUP CAN BE ASSIGNED THE SAME FUEL GROUP.

Example:

Group 1 grass group
Group 2 shrub group
Group 3 timber litter group
Group 4 logging slash group

On a flipchart have each group identify and list the following for their assigned fuel group:

1. Rate of spread
2. Reaction to water
3. Mopup time required
4. Duration of heat and flame
5. Best engine type utilized
6. Best method of attack (indirect, direct, or parallel).
7. Provide examples of areas of the country where this fuel group is a concern.

Unit 3
Exercise 2

DIVIDE THE STUDENTS INTO SMALL WORKABLE GROUPS OF 3-6 STUDENTS. ASSIGN ONE OF THE FOLLOWING ELEMENTS OF LCES TO EACH GROUP:

Example:

Group 1	Lookouts
Group 2	Communications
Group 3	Escape routes
Group 4	Safety zones

If you have more than four groups then assign the same topic to more than one group.

For each topic have the students identify:

1. How does this apply to them as an Engine Boss?
2. What are important considerations?
3. Provide an example of where they may have observed a violation of this principle.
4. What actions they would take to correct this in the future?

Unit 3
Exercise 3

USING THE SAME STUDENT GROUPS AS IN EXERCISE 2, ASSIGN EACH GROUP ONE OF THE FOLLOWING FOUR TOPICS.

1. Fuels
2. Topography
3. Weather
4. Fire behavior

For their assigned topic each group will identify and list:

1. Elements that need to be considered when sizing up your assigned topic.
2. How these factors affect your decision making during engine operations.
3. Whom do you communicate the sizeup to? What other factors (human) could affect your decision-making process during engine operations?

Sizeup Considerations for the Following Key Factors:

FUELS:

- Type/Model
- Size Class
- Are Fuels Light and Continuous
- Live/Dead Ratio (Bug Kill, Drought)
- Fuel Moisture
- Continuity (Ladder Fuels, Tight Crown)
- Loading (Heavy vs. Light)
- Fuel Temperature in Relation to Aspect

TOPOGRAPHY:

- Aspect
- Position on Slope
- Building Line Uphill or Downhill
- Width of Canyons
- Box Canyons or Chutes
- Percent of Slope
- Potential for Rolling Material

Unit 3, Exercise 3, continued

TOPOGRAPHY (continued):

- Available Natural or Constructed Barriers
- Elevation

WEATHER:

- Maximum/Minimum Relative Humidity
- Wind Velocity, Direction, Patterns (Gusty vs. Steady)
- Temperature
- Thunderstorm Activity
- Indicators of Turbulence (Dust Devils, Thunderstorms)
- Indicators of Instability (Inversions Lifting, Etc.)

FIRE BEHAVIOR:

- ERC/BI Pocket Cards for the Local Area
- Rates of Spread
- Type of Fire Spread (Head, Backing, Flanking)
- Ground, Surface, Aerial
- Indicators of Extreme Fire Behavior.
- Size of Fire
- Location Relative to Topographic Features
- Time of Day

Unit 3, Exercise 3, continued

OTHER SIZEUP FACTORS:

- Access, e.g., ingress, egress
- Water Sources
- Availability of Other Resources

DETAILED LESSON OUTLINE

COURSE: Engine Boss (Single Resource), S-231

UNIT: 4 - Tactics

SUGGESTED TIME: 2 Hours

TRAINING AIDS: Personal computer with LCD projector and presentation software or overhead projector; flipcharts, felt tip markers.

OBJECTIVES: Upon completion of this unit, the student will be able to:

1. Describe the advantages and disadvantages of direct, parallel, and indirect attack in a fire situation.
2. Develop alternative plans based upon equipment failures and/or personnel problems.
3. Determine appropriate tactics to be used based upon changes in fire behavior, fire weather, and terrain.

OUTLINE	AIDS & CUES
<p>PRESENT UNIT OBJECTIVES AND DISCUSS.</p> <p>I. METHODS OF ATTACK</p> <p>There are three different attack methods used on wildland fires; direct, parallel, and indirect.</p> <p>DISCUSS THE THREE METHODS OF ATTACK WITH THE STUDENTS.</p> <p>HAVE THE STUDENTS IDENTIFY HOW THESE METHODS RELATE TO ENGINE ACTIVITIES.</p>	<p>04-01-S231-EP 04-02-S231-EP</p>

OUTLINE	AIDS & CUES
<p>A. Direct Attack</p> <p>When constructing a fireline directly on the fire perimeter, keep one foot (or tire) in the black.</p> <p>1. Advantages of the direct attack method are:</p> <ul style="list-style-type: none"> • Minimal area is burned; no additional area is intentionally burned. • It is the safest place to work; firefighters can usually escape into the burned area. • The possibility of fire moving into the crowns of trees is reduced. • The uncertainties of burning out or backfiring can be reduced/eliminated. <p>ASK STUDENTS IF THERE ARE ANY OTHER ADVANTAGES AND DISCUSS.</p> <p>WHAT FUEL GROUPS AND/OR CONDITIONS ALLOW FOR DIRECT ATTACK?</p> <p>REFERENCE THE FIRE BEHAVIOR CHARACTERISTICS CHART AND THE FIRE SUPPRESSION INTERPRETATIONS TABLE IN APPENDIX B OF THE FIRELINE HANDBOOK TO ILLUSTRATE CONSIDERATIONS FOR USING DIRECT OR INDIRECT ATTACK.</p>	<p>04-03-S231-EP</p> <p>FHB, Appendix B</p>

OUTLINE	AIDS & CUES
<p>2. Disadvantages to the direct attack method are:</p> <ul style="list-style-type: none"> • Firefighters can be hampered by heat, smoke and flames. • Control lines can be very long and irregular. • Burning material can easily spread across mid-slope lines. • May not be able to use natural or existing barriers. • More mopup and patrol is usually required. • Less effective on fast moving fires. <p>ASK STUDENTS IF THERE ARE ANY OTHER DISADVANTAGES AND DISCUSS.</p> <p>BRIEFLY DISCUSS THE FOLLOWING TACTICS (PINCER, TANDEM, ENVELOPMENT, AND PARALLELATTACK).</p> <p>THESE TACTICS WILL BE REINFORCED IN EXERCISE 2 AT THE CONCLUSION OF THIS UNIT.</p>	<p>04-04-S231-EP</p>
<p>3. Direct attack tactics include:</p> <ul style="list-style-type: none"> • Pincer - direct attack around a fire in opposite directions by two or more fire control resources. 	<p>04-05-S231-EP 04-06-S231-EP</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • Tandem - direct attack along a part of the fire perimeter by two or more fire control resources. Control resources follow each other (can leap frog). • Envelopment - the fire's perimeter is attacked at several places at one time with multiple anchor points. <p>Critical areas are attacked first using the hotspotting technique, then the engines start moving towards each other.</p> <p>If this method is used, timing must be well coordinated. If not, a section of line may be overlooked, and the fire may escape, outflanking firefighters.</p> <p>This technique is commonly associated with structure protection in the wildland/urban interface.</p>	<p>04-07-S231-EP 04-08-S231-EP</p> <p>04-09-S231-EP 04-10-S231-EP</p>
<p>THE METHODS OF ATTACK IN THIS UNIT ARE OUTLINED IN THE WILDFIRE SUPPRESSION TACTICS REFERENCE GUIDE. CONSIDER HAVING THE STUDENTS REFER TO THE PAGES IN THEIR GUIDES THAT ILLUSTRATE THESE METHODS.</p>	<p>WFSTRG</p>
<p>B. Parallel Attack</p> <p>Constructing a fireline parallel to, but further from, the fire perimeter than in direct attack, due to fire intensity.</p>	<p>04-11-S231-EP 04-12-S231-EP</p>

OUTLINE	AIDS & CUES
<p>1. Advantages of parallel attack.</p> <ul style="list-style-type: none"> • May shorten line by cutting across unburned fuels. Intervening strips of narrow fuels are immediately burned out. • Shortened line may reduce actual line construction. • Personnel exposure to heat and smoke is reduced. 	04-13-S231-EP
<p>2. Disadvantages of parallel attack.</p> <ul style="list-style-type: none"> • Requires personnel experienced in burning out. • Personnel do not always have access to the back for safety. • Safety may be compromised prior to the time that the unburned fuel can be burned out. 	04-14-S231-EP
<p>C. Indirect Attack</p> <p>Constructing a fireline some distance from the fire perimeter. Should use a barrier (natural or constructed) in the fireline construction, if available. Intervening strip is wide and fuels are burned out. Allows for choice of timing for burning out.</p>	04-15-S231-EP 04-16-S231-EP

OUTLINE	AIDS & CUES
<p>1. The advantages of the indirect attack are:</p> <ul style="list-style-type: none"> • Permits easier work for crew because of less smoke, heat and flame contact. • May reduce length and irregularity of fire edge and control line. • Permits crews to take advantage of natural fire barriers and fuel types. • Reduces the danger of slopovers. 	04-17-S231-EP
<p>ASK STUDENTS IF THERE ARE ANY OTHER ADVANTAGES AND DISCUSS.</p>	
<p>2. The disadvantages of the indirect attack method are:</p> <ul style="list-style-type: none"> • May not be able to see the main fire. Requires a lookout and excellent communications. • Fire can catch firefighters working in unburned fuel. • Fire can outflank and put crew in jeopardy. • Increased acreage burned. • Burnout operations can cause control problems. • Burnout operations must be well coordinated. 	04-18-S231-EP

OUTLINE	AIDS & CUES
<p>ASK STUDENTS IF THERE ARE ANY OTHER DISADVANTAGES AND DISCUSS.</p>	
<p>ADVISE STUDENTS TO UTILIZE A COMBINATION OF ATTACKS. BE FLEXIBLE, IF THE DIRECT ATTACK IS NOT WORKING START THINKING ABOUT GOING PARALLEL OR INDIRECT ATTACK.</p>	04-19-S231-EP
<p>II. DELIVERY OF ATTACK METHODS</p>	
<p>A. Stationary</p>	
<p>ASK STUDENTS TO IDENTIFY HOW TERRAIN, FUELS, AND METHOD OF ATTACK AFFECT THE TYPE OF HOSELAY UTILIZED.</p>	
<p>1. Simple hose lay:</p> <ul style="list-style-type: none"> • A hose lay consisting of consecutively coupled lengths of hose without laterals. • The lay is extended by inserting additional lengths of hose in the line between pump and nozzle. 	04-20-S231-EP 04-21-S231-EP
<p>ASK THE STUDENTS TO IDENTIFY IN WHAT FUEL TYPES AND/OR SITUATIONS IT MAY BE MORE ADVANTAGEOUS TO UTILIZE A STATIONARY HOSELAY AND WHY.</p>	
<p>2. Progressive hose lay:</p> <ul style="list-style-type: none"> • A hose lay in which double shut off wyes are inserted in the main line at intervals. 	04-22-S231-EP 04-23-S231-EP

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • Lateral lines are run from wyes to the fire edge. • Permits continuous application of water during extension of hose lay. • Utilized during stationary attack when access via engine is not available. <p>B. Mobile attack</p> <p>1. Also referred to as:</p> <ul style="list-style-type: none"> • Pump and roll • Mobile pump • Identify any others 	
<p>DISCUSS CONSIDERATIONS FOR POWER TAKE OFF (PTO) EQUIPPED ENGINES. WHERE ARE THEY BEST UTILIZED, ETC.</p> <p>DISCUSS LOCALLY USED METHOD AND OTHER NAMES THAT MAY BE USED TO DESCRIBE MOBILE ATTACK.</p> <p>ASK STUDENTS TO IDENTIFY THE FOLLOWING SITUATIONS.</p>	<p>04-24-S231-EP 04-25-S231-EP</p>
<p>2. What are situations where mobile attack with engines should not be used?</p> <ul style="list-style-type: none"> • Firefighter safety is jeopardized • Access to fireline is poor 	<p>04-26-S231-EP</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • Terrain is too rough to travel • Long turnaround times to water • Frontal attacks with fast flame spread • Attacks on long flame lengths • Fuels too dense to negotiate 	
<p>III. ENSURE PERSONNEL SAFETY</p> <p>REVIEW THE FOLLOWING LIST ON PERSONNEL SAFETY. ASK THE STUDENTS TO IDENTIFY HOW EACH ITEM MAY AFFECT THEM AS AN ENGINE BOSS AND TO IDENTIFY ANY SPECIAL CONCERNS.</p> <p>IF DIFFERENT AGENCIES ARE REPRESENTED IN THE STUDENT GROUP, ENCOURAGE DISCUSSION ON ANY DIFFERENCES IN THE PRACTICES THEY MAY UTILIZE AND WHY.</p>	
<ul style="list-style-type: none"> • Fight fire in fuels consistent with engine capabilities. • Use direct attack when possible. • Attack flank with greatest potential for escape. • Burn out unburned fuels. • Use extreme caution during frontal assaults. 	04-27-S231-EP
<ul style="list-style-type: none"> • Avoid fire path of least resistance (chimneys, chutes and saddles.) 	04-28-S231-EP

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • Recognize topography hazards. • When preserving area of origin, continue to consider firefighter safety. • Be aware of environmental factors. • Recognize education and experience. <p>IV. ALTERNATIVES TO YOUR PRIMARY PLAN BASED ON THE POSSIBILITY OF BREAKDOWN OR EQUIPMENT FAILURE</p> <p>When involved in ongoing wildland fire operation activities:</p> <p>What methods do you use to ensure that your engine and equipment are available and operational for your tactical assignment?</p> <p>In the event of an engine or equipment breakdown what are your responsibilities?</p> <p>A. Planning</p> <ol style="list-style-type: none"> 1. Plan ahead so a particular area can be covered by another resource or engine in the event of a breakdown or failure. 2. Work with backup help whenever engine or equipment breakdowns will jeopardize the safety of you and your crew. 	<p>04-29-S231-EP</p> <p>04-30-S231-EP</p>

OUTLINE	AIDS & CUES
<p>B. Alternate Methods To Accomplish Assigned Tasks</p> <ol style="list-style-type: none"> 1. Use of hand tools 2. Use of backpack pumps 3. Use of portable pumps 4. Work with other engine crews to accomplish assigned tasks. 5. Request assistance to accomplish assigned tasks. 	04-31-S231-EP
<p>C. Responsibilities of the Engine Boss in the Event of Equipment Breakdown</p> <ol style="list-style-type: none"> 1. Keep your supervisor informed. 2. Reevaluate safety considerations. 3. Keep assigned personnel informed of any changes in the tactical assignment. 4. Keep adjacent forces informed. 	04-32-S231-EP
<p>INVOLVE STUDENTS IN A DISCUSSION OF THE METHODS ABOVE. ASK FOR EXAMPLES OF HOW THE STUDENTS MAY HAVE EXPERIENCED SOME OF THESE SITUATIONS OR TO DESCRIBE OTHER SITUATIONS THAT WERE NOT MENTIONED IN THE OUTLINE.</p>	

OUTLINE	AIDS & CUES
<p>ADMINISTER EXERCISE 1</p>	<p>04-01-S231-IR</p>
<p>THIS EXERCISE IS NOT INTENDED TO CONTAIN SOME LONG INVOLVED ANSWERS. THE STUDENTS NEED TO CONSIDER THE CIRCUMSTANCES AND RESPOND ACCORDINGLY. THE INSTRUCTOR MAY WANT TO ADD SOME WHAT IF'S, TO INCREASE THE COMPLEXITY.</p>	<p>SW p. 4.7 04-33-S231-EP</p>
<p>ALLOW 5 MINUTES FOR THE STUDENTS TO COME UP WITH SOLUTIONS TO THE QUESTIONS.</p>	
<p>DISCUSS THE STUDENT'S ANSWERS. CALL ON MORE THAN ONE STUDENT AS NEEDED TO ADEQUATELY COVER THE MATERIAL.</p>	<p>04-34-S231-EP 04-35-S231-EP</p>
<p>ADMINISTER EXERCISE 2</p>	<p>04-02-S231-IR</p>
<p>DIVIDE THE STUDENTS INTO SMALL GROUPS AND REFER THEM TO THE SCENARIOS 1-4 IN THEIR STUDENT WORKBOOKS.</p>	<p>SW p. 4.9-18 04-36-S231-EP</p>
<p>ALLOW 40 TOTAL MINUTES FOR STUDENTS TO COMPLETE ALL SCENARIOS. THIS EXERCISE IS DESIGNED TO BE INTERACTIVE. EACH GROUP WILL PROVIDE SOLUTIONS TO ALL THE SCENARIOS.</p>	
<p>COMPLETE ONE SCENARIO AT A TIME AND CONTINUE UNTIL ALL THE SCENARIOS HAVE BEEN PRESENTED AND DISCUSSED.</p>	

OUTLINE	AIDS & CUES
<p>EACH GROUP IS TO PROVIDE A SOLUTION FOR EACH SCENARIO BASED ON THE FOLLOWING:</p> <ol style="list-style-type: none"> 1. BEST METHOD OF ATTACK. 2. PLACEMENT OF RESOURCES. 3. ADVANTAGES, DISADVANTAGES, SAFETY CONCERNS, AND CONSIDERATIONS. <p>ALLOW STUDENT GROUPS 5-10 MINUTES TO COMPLETE THE FIRST SCENARIO. ASK ONE OR TWO GROUPS TO PRESENT THEIR SOLUTION. HAVE EACH GROUP PICK A SPOKESPERSON AND PRESENT THEIR SOLUTION TO THE CLASS.</p> <p>THE SCENARIO MAPS CAN BE PRINTED ON TO OVERHEAD TRANSPARENCIES OR DISPLAYED ON THE SCREEN WITH THE ELECTRONIC PRESENTATION TO ENABLE THE STUDENTS TO PRESENT THEIR SOLUTIONS TO THE CLASS.</p> <p>FACILITATE A DISCUSSION AMONG ALL GROUPS BASED ON GROUP PRESENTATIONS. THERE ARE NO “TEXTBOOK” ANSWERS. STUDENT SOLUTIONS MAY DIFFER. STUDENTS NEED ONLY TO JUSTIFY REASONS FOR THE TACTICS AND STRATEGY THEY USED.</p> <p>REVIEW THE UNIT OBJECTIVES AND DISCUSS.</p>	<p>04-37-S231-EP thru 04-41-S231-EP</p> <p>04-42-S231-EP</p>

Unit 4—Exercise 1

Fuel Group: Hardwood Timber Litter

Date: September 24, 1600 hours

Weather: Winds are light and variable 5-7 mph. RH is 28%

Fire Behavior: Flame lengths are 5 ft. at the head of the fire.

Topography: Rolling terrain, negotiable by type 5 engines.

Resources: 2 Type 5 engines including yours.

Scenario: You are working an isolated finger of a large fire in tandem with another type 5 engine. The engine that you have been working with is currently refilling their water supply and not on scene. Your engine quits.

Given the situation:

1. What contingency plan did you have in place prior to initiating fire suppression activities?
2. What do you do?

Unit 4—Exercise 2

Scenario 1

Fuel Group: Grass

Weather: Winds out of the southeast 5-10 mph.

Fire Behavior: Flame length approximately 5 ft. at the head of the fire. Fire is moving in a northwest direction.

Topography: Relatively flat terrain.

Resources: You have arrived on scene with your engine and crew and will be working with another engine that is on scene.

Scenario: The fire is active at the head and running to the northwest. All available weather indicators appear that they will remain constant. The fire is approximately 10-15 acres. Using the available information and any other resources available, how will you coordinate with the other Engine Boss to best deploy your resources? Illustrate on the map and determine the tactics used.

Provide a solution for this scenario based on the following:

1. Best method of attack.
2. Placement of resources.
3. Advantages, disadvantages, safety concerns, and considerations.

Unit 4—Exercise 2

Scenario 2

Fuel Group: Grass with pockets of brush

Weather: Winds are variable with gusts to 15-20 mph.

Fire Behavior: Flame lengths are 6-8 ft. on an uneven edge caused by pockets of brush. Flame lengths at the heads of the fire are 12-15 ft. caused by the predominant winds.

Topography: Rolling terrain, negotiable by lighter engines.

Resources: 3 Type 6 engines including yours.

Scenario: The fire is currently 15-20 acres. With the information given, how would you coordinate with other resources to best deploy available resources?

Provide a solution for this scenario based on the following:

1. Best method of attack.
2. Placement of resources.
3. Advantages, disadvantages, safety concerns, and considerations.

An engine crewmember has been stung by a bee and has gone into anaphylactic shock.

1. What are your responsibilities as an Engine Boss?

2. Whom would you contact?

3. How would this change your tactics?

POSSIBLE ANSWERS:

1. **RECOGNIZE THAT THERE IS A MEDICAL PROBLEM.**
2. **NOTIFY SUPERVISOR AND ADJOINING FORCES OF THE MEDICAL EMERGENCY.**
3. **DEAL WITH MEDICAL PROBLEM ACCORDING TO STANDARD OPERATING PROCEDURE.**
4. **REEVALUATE WHAT HAS CHANGED. MOVE TO A SAFE AREA; IMPLEMENT LCES.**

Unit 4—Exercise 2

Scenario 3

Fuel Group: Grass and shrub.

Weather: Winds are light and variable from the south/southwest.

Fire Behavior: Flame lengths are approximately 4 feet on the flanks and 6 feet at the head of the fire. The fire is active at the head of the fire and on the flanks. The fire is moving actively through the grasses but not running at an extreme rate.

Topography: Mild rolling terrain.

Resources: You arrive on scene with your Type 5 engine and crew. Also arriving at the same time are four other engines and crews, two Type 4 engines and two Type 6 engines. These engines are multi-agency including a volunteer fire department.

Scenario: The fire is currently 15-20 acres. The mild and rolling terrain is accessible by engines. The multiple spread on the flanks and head of the fire is causing immediate threats to the structures. How would you coordinate with other resources to best deploy the resources on scene.

Provide a solution for this scenario based on the following:

1. Best method of attack.
2. Placement of resources.
3. Advantages, disadvantages, safety concerns, and considerations.

Scenario 3A:

The fire continues on past the structures towards a road. Fuels and fire behavior are the same. How will you change your strategy?

Unit 4–Exercise 2

Scenario 4

Fuel Group: Grasses and areas of timber litter.

Weather: Winds are 10-15 mph out of the southwest and erratic.

Fire Behavior: Fire is wind driven at the head and influenced by topography on the west and northwest sides. Some minor spotting is being caused by the erratic winds.

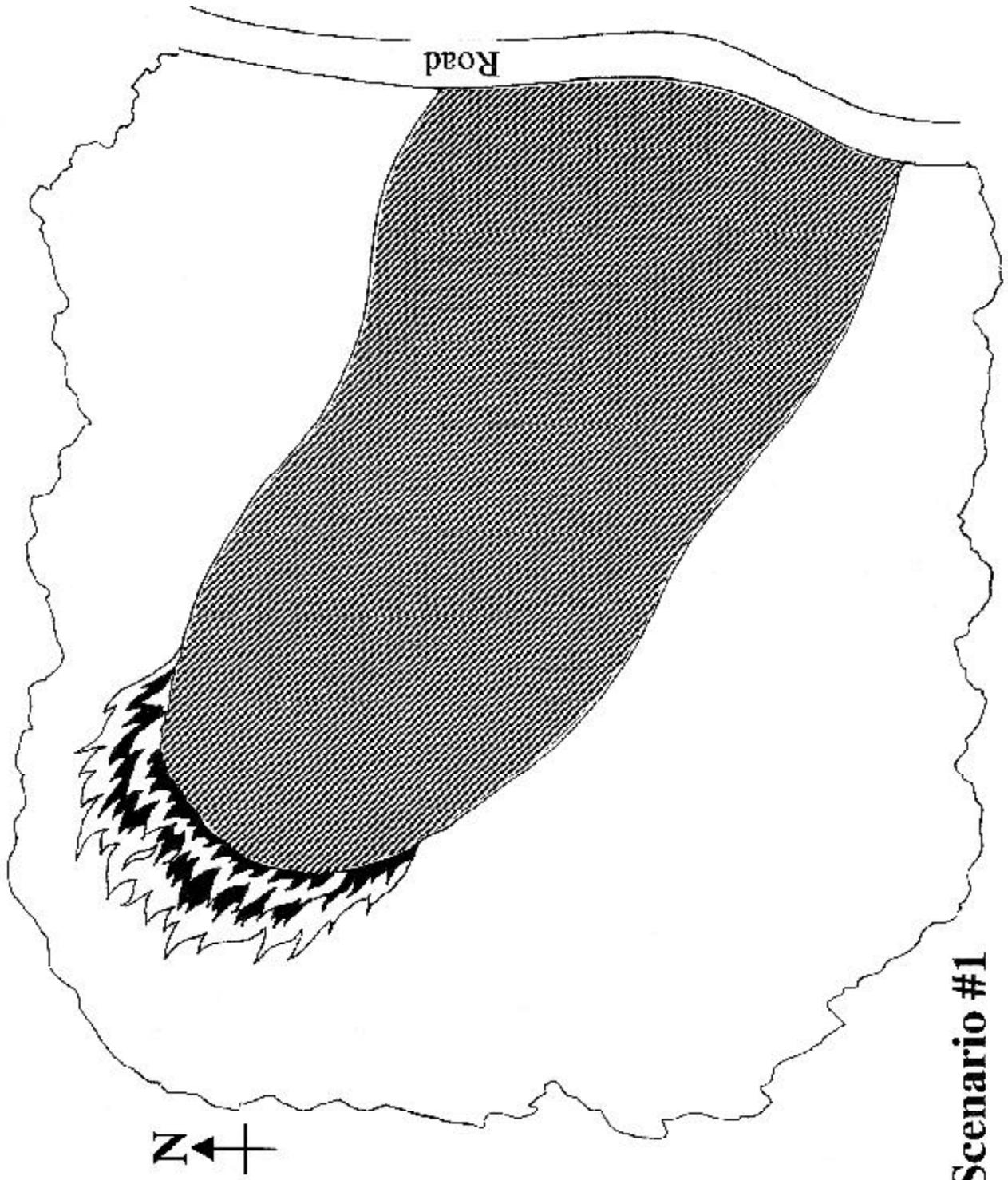
Topography: Terrain is steep on the west and northwest sides and rolling grass and sagebrush on the south and southeast sides.

Resources: 3 Type 4 engines including yours are on scene.

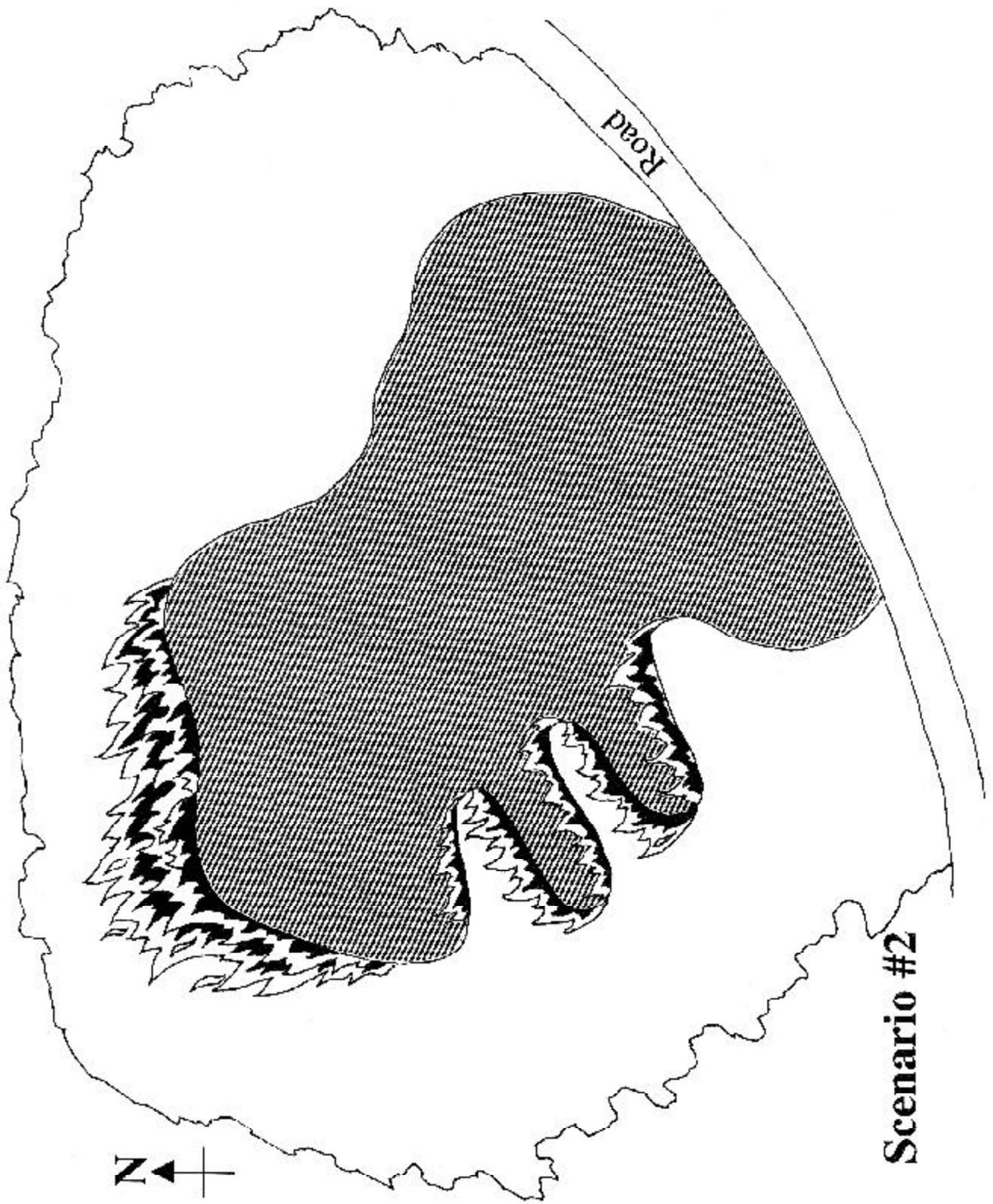
Scenario: The fire is currently 10-15 acres. Fire is accessible by engines on the south flank. The west and northwest flanks are burning into steep terrain dominated by timber that will limit engine access where the terrain becomes steeper. How would you coordinate with the other resources to best deploy the available resources with the given information?

Provide a solution for this scenario based on the following:

1. Best method of attack.
2. Placement of resources.
3. Advantages, disadvantages, safety concerns, and considerations.

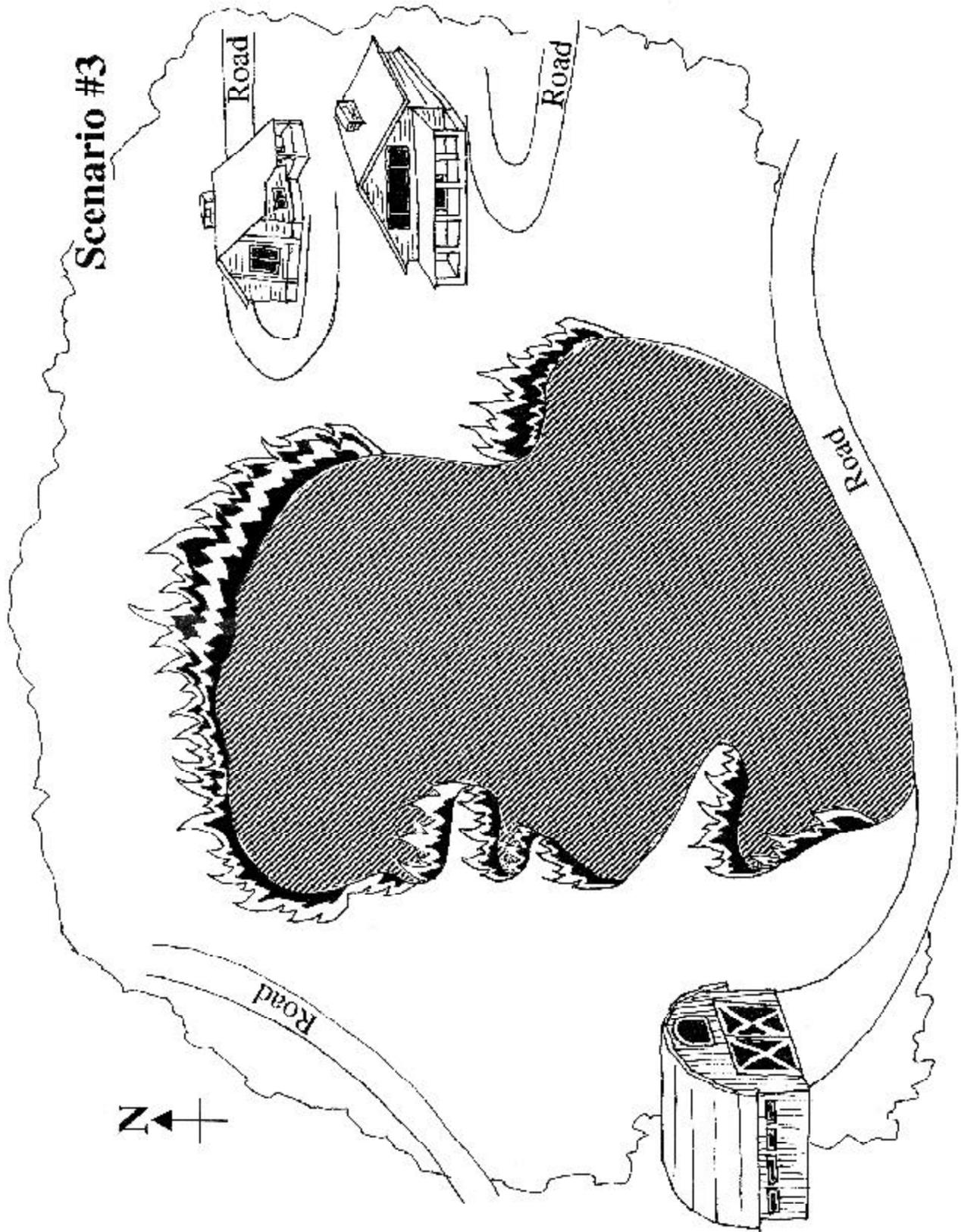


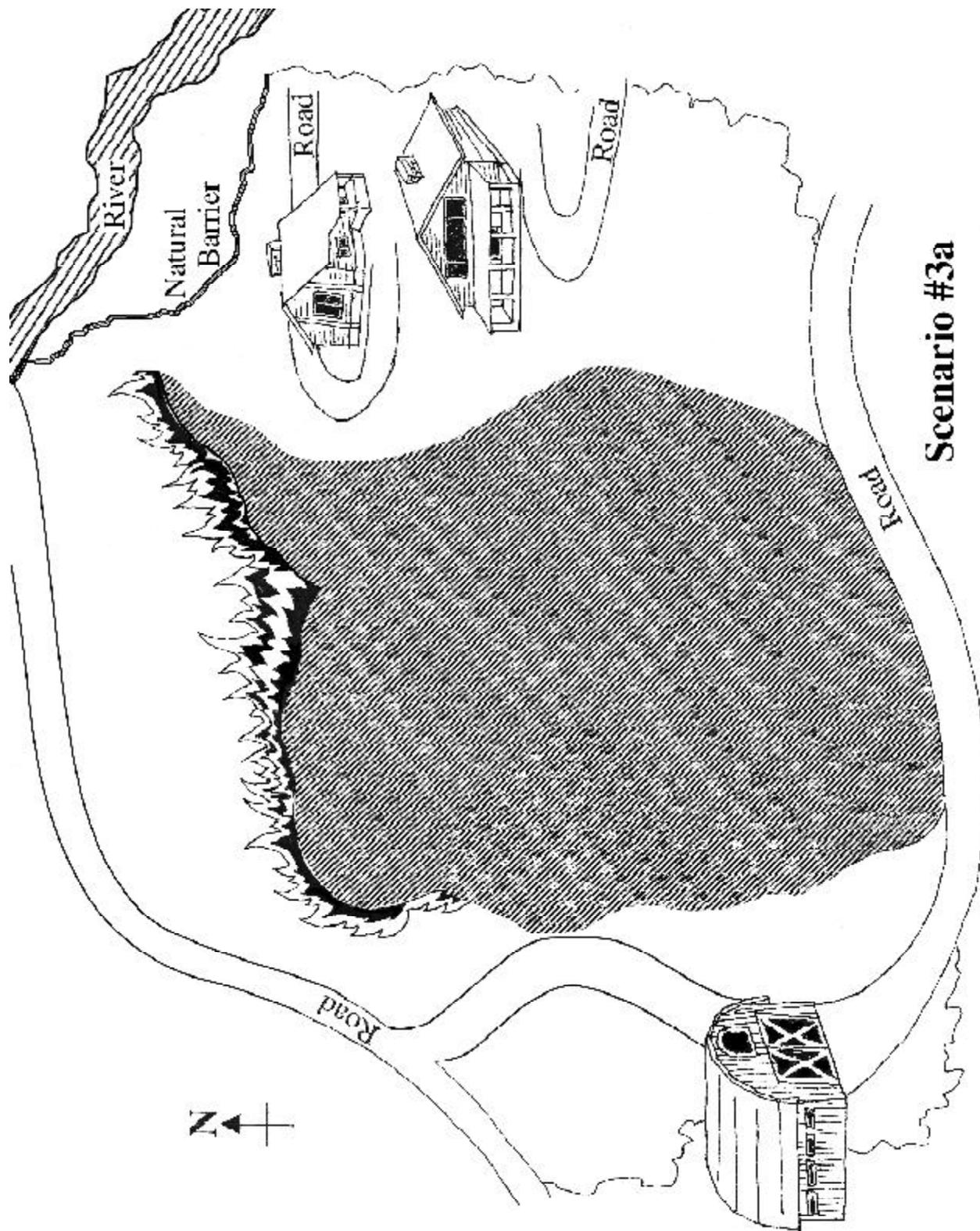
Scenario #1



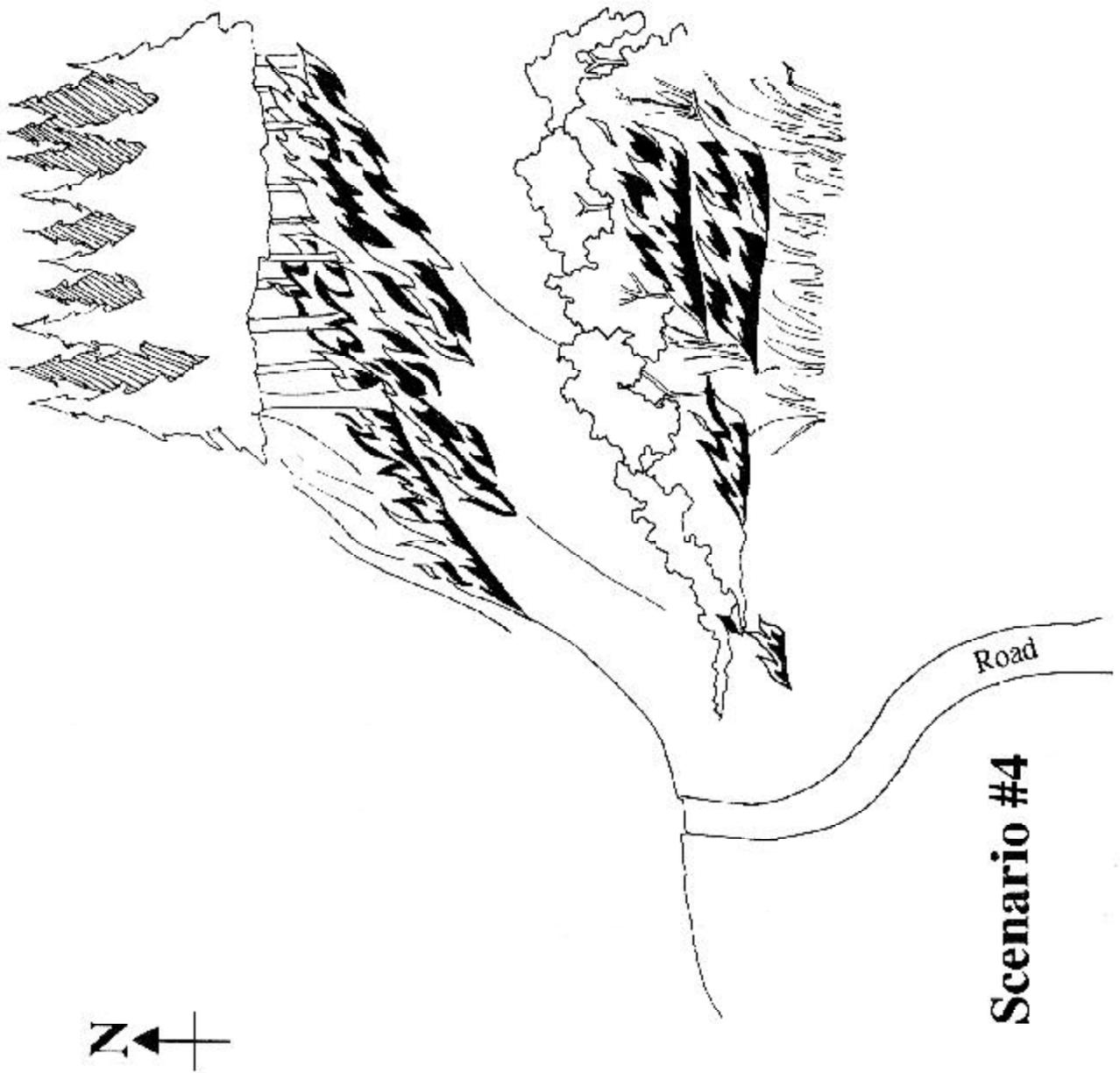
Scenario #2

Scenario #3





Scenario #3a



Scenario #4

DETAILED LESSON OUTLINE

COURSE: Engine Boss (Single Resource), S-231

UNIT: 5 - Wildland/Urban Interface

SUGGESTED TIME: 2 Hours

TRAINING AIDS: Personal computer with LCD projector and presentation software or overhead projector; flipcharts, felt tip markers.

OBJECTIVES: Upon completion of this unit, the student will be able to:

1. Identify wildland/urban interface characteristics that must be monitored.
2. Describe safety hazards commonly encountered in wildland/urban interface fires.

OUTLINE	AIDS & CUES
<p>PRESENT THE UNIT OBJECTIVES AND DISCUSS.</p> <p>THIS UNIT IS PRESENTED TO GIVE THE STUDENTS AN OVERVIEW FOR ENGINE CONSIDERATIONS IN THE WILDLAND/URBAN INTERFACE. THIS TOPIC IS COVERED IN DEPTH IN FIRE OPERATIONS IN THE URBAN INTERFACE, S-215.</p> <p>S-215 OFFERS SEVERAL VIDEOS THAT THE INSTRUCTOR MAY WANT TO UTILIZE TO ENHANCE THIS SECTION. ANOTHER EXCELLENT SOURCE OF SUPPLEMENTAL INFORMATION IS CONTAINED IN THE FIREWISE WEBSITE AT WWW.FIREWISE.ORG.</p>	<p>05-01-S231-EP 05-02-S231-EP</p>

OUTLINE	AIDS & CUES
<p>I. INTRODUCTION</p> <p>With the increased firefighting activities in the urban interface, wildland firefighters must become aware of a new fire environment.</p> <p>Structure defense is an unfamiliar role to most wildland firefighters.</p> <p>Firefighters tend to place themselves at greater risk when battling wildland fires in an effort to save homes.</p> <p>Remember: Safety of life is most important and must be adhered to by the use of the Standard Firefighting Orders, Watch Out Situations, and the use of LCES. The ability to access escape routes and safety zones is of the utmost importance.</p> <p>IN THE FIREFIGHTER SAFETY SECTION OF THE FIRELINE HANDBOOK, THE FOLLOWING STATEMENT CAN BE FOUND UNDER “SAFETY WHILE PROTECTING STRUCTURES FROM WILDLAND FIRES”.</p> <p><i>Structures exposed to wildland fire in the urban interface can and should be considered as another fuel type. Sizeup and tactics should be based upon fuels, weather and topography, just as those criteria would be applied to a wildland fire.</i></p> <p>PRESENT THIS STATEMENT AND DISCUSS AS NEEDED.</p>	<p>05-03-S231-EP</p> <p>05-04-S231-EP FHB</p>

OUTLINE	AIDS & CUES
<p>II. WILDLAND/URBAN INTERFACE CONSIDERATIONS</p>	
<p>Engine crews are commonly utilized to protect structures during wildfire incidents.</p>	
<p>Crews that are not familiar with operations in the wildland/urban interface should not be assigned structural protection duties.</p>	
<p>A. Triage</p> <p>Sorting and setting priorities for structures requiring protection from wildfires.</p>	05-05-S231-EP
<p>B. Five Factors That Affect Triage Decisions:</p> <ol style="list-style-type: none"> 1. Firefighter safety 2. Structure 3. Surrounding fuels 4. Fire behavior 5. Available resources 	05-06-S231-EP
<p>C. Triage Categories:</p> <ol style="list-style-type: none"> 1. Needing “LITTLE or NO ATTENTION” 2. Needs “PROTECTION,” but “SAVABLE” 3. “CANNOT BE SAVED” 	05-07-S231-EP

OUTLINE	AIDS & CUES
<p>EXERCISE 1, WILDLAND/URBAN INTERFACE. HAVE STUDENTS OBSERVE THE EP SLIDES AND DECIDE WHICH OF THE THREE TRIAGE CATEGORIES EACH STRUCTURE PICTURED FITS INTO. EACH GROUP IS TO RECORD THEIR OBSERVATION ON A FLIP CHART AND THEN PRESENT TO THE CLASS. ALLOW 20 MINUTES FOR THIS EXERCISE.</p>	<p>05-08-S231-EP 05-09-S231-EP 05-10-S231-EP thru 05-15-S231-EP 05-16-S231-EP</p>
<p>D. When It Is Time To Withdraw:</p> <p>No simple rule will tell you when to try, or at what time to abandon, a structure defense effort.</p> <p>Listed below are some factors or conditions worth noting.</p> <p>If any of these apply, then the attempt to save that structure deserves careful consideration before continuing.</p>	<p>05-17-S231-EP</p>
<p>REFER STUDENTS TO THE INCIDENT RESPONSE POCKET GUIDE (IRPG), “STRUCTURE PROTECTION CHECKLIST” AND “STRUCTURE ASSESSMENT CHECKLIST.”</p>	<p>IRPG</p>
<ol style="list-style-type: none"> 1. You cannot safely remain at the structure and/or your escape route could become unusable. Your safety is in jeopardy. 2. The fire is making significant runs (not just isolated flare-ups) in the standing live fuels, e.g., brush or tree crowns, and the structure is within one or two flame lengths of the fuels. 	

OUTLINE	AIDS & CUES
<ol style="list-style-type: none"> 3. Spot fires are igniting around the structure or on the roof and beginning to grow faster than you can put them out. 4. Your water supply will not allow you to continue firefighting until the threat subsides. 5. The roof is more than 1/4 involved, in windy conditions, and other structures are threatened or involved. 6. Interior rooms are involved and windows are broken, in windy conditions, and other structures are threatened or involved. 	
<p>EMPHASIZE THAT THESE ARE TECHNIQUES FOR DEFENDING STRUCTURES FROM THE OUTSIDE.</p>	
<p>MOST WILDLAND FIREFIGHTING AGENCIES ARE INVOLVED IN PREVENTING A FIRE’S SPREAD TO STRUCTURES.</p>	
<p>IT MAY BE BENEFICIAL TO COVER YOUR PARTICULAR AGENCY’S RESPONSIBILITY FOR STRUCTURE PROTECTION.</p>	
<p>III. WATCH OUT SITUATIONS FOR THE WILDLAND/ URBAN INTERFACE</p>	
<p>REFERENCE THE INCIDENT RESPONSE POCKET GUIDE, “WILDLAND/URBAN WATCH OUTS.”</p>	
	<p>IRPG</p>

OUTLINE	AIDS & CUES
<p>A. Wildland/Urban Watch Out #1</p> <p>Poor Access and Narrow One-Way Roads.</p> <p>There are numerous problems associated with the use of roads in the wildland/urban interface:</p> <ol style="list-style-type: none"> 1. Road bed material often is made of loose gravel, loosely compacted rock base material and sand, decomposed granite, or clay. <p>These road beds can deteriorate creating road hazards: e.g., washouts, washboards and large potholes. Such hazards delay departure (egress) threatening your safety.</p> <ol style="list-style-type: none"> 2. Road width <p>Narrow and winding roads become obscured during smoky conditions. Driving becomes dangerous because the driver is not able to see the edge of the road or oncoming traffic. A narrow road creates congestion by vehicles not being able to pass.</p> <p>A good safety practice would be to secure the road by controlling traffic at each end with personnel that have common communications and capabilities.</p> <p>Remember: Evacuees have the right of way. Human safety is number one priority.</p>	<p>05-18-S231-EP</p>

OUTLINE	AIDS & CUES
<p>3. Position on slope</p> <p>Roads built in the middle or upper slopes are exposed to convection and radiant heat.</p> <p>4. Fuel Canopy</p> <p>Beware of ladder fuels across roads:</p> <ul style="list-style-type: none"> • Light fuels into heavy fuels (grass to doghair thicket) • Brush into logging slash (jackpots) • Dead and down woody fuels (red slash) <p>Fuel accumulations and concentrations can jeopardize your safety by blocking your egress. Flame lengths can be high, indicating an increasing fireline intensity.</p> <p>5. Adjacent fuels</p> <p>Beware of your fire environment such as:</p> <ul style="list-style-type: none"> • Fuel types • Fuel density • Fuel height • Fuel size • Fuel moisture along the roadway 	

OUTLINE	AIDS & CUES
<p>When burning, these fuels could block your escape route. However, they may serve to your advantage for burning out along roadways to secure a safety zone.</p> <p>6. Roads in the wildland/urban interface often:</p> <ul style="list-style-type: none"> • Are not on maps due to land exchanges, etc. • Are private roads with one way in and one way out. • Are between 16 to 20 feet wide, and can be less than 16 feet wide. • Have a road grade between 10 to 20 percent. • Are dead end roads or cul-de-sacs. • Have driveways that may not be accessible or provide poor access for fire vehicles. • Create difficult vehicle departure (egress). • Allow vehicles to block your departure (egress). 	

OUTLINE	AIDS & CUES
<p>B. Wildland/Urban Watch Out #2</p> <p>Bridge Load Limits</p> <ol style="list-style-type: none"> 1. Fire vehicles may exceed the weight limits of many rural bridges. 2. Construction of the bridge may be wooden beams and cross members, weakened by environmental conditions and age. 3. Bridge width may not be adequate. 	<p>05-19-S231-EP</p>
<p>C. Wildland/Urban Watch Out #3</p> <p>Wooden Construction and Wood Shake Roofs</p> <p>These types of structures are easy targets for firebrands and burning fuel adjacent to structures. Most wooden structures are not treated with flame-resistant compounds.</p> <p>The fireline intensity is usually high, therefore radiant heat preheats the structure until it reaches combustion temperatures.</p> <p>Openings in buildings provide entry points for fire and fire brands regardless of construction materials.</p> <ol style="list-style-type: none"> 1. Check eaves, roof, roof vents, and decks for smoldering embers or hidden flames. 	<p>05-20-S231-EP</p>

OUTLINE	AIDS & CUES
<p>2. Remove any combustible furniture or objects from decks, patios, or other areas where they could ignite and spread fire to the structure. Place them in a pile on the lawn or other safe out of the way area. Follow agency policy on entering and removing valuables from threatened structures.</p> <p>3. Do not enter the interior of any structure, create an opening, or attempt to ventilate a structure that appears to be or to have been on fire unless you are properly trained, equipped, and have agency approval for such action.</p> <p>4. Dangerous structure fire situations:</p> <p>The following characteristics may indicate a backdraft or smoke explosion condition. Remain a safe distance away from these structures.</p> <ul style="list-style-type: none"> • Black or dark smoke leaves the building in puffs or intervals (looks like it is “breathing”). • Dark smoke stained windows (intact) with muffled sounds heard from the inside of the structure. • Closed structure appears to have an interior fire but there are no openings for the smoke and heat you see to escape and little or no open flame visible inside. 	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • Black smoke pushing out of low openings like cracks in walls, bottoms of doorways, or other low to the ground locations. <p>D. Wildland/Urban Watch Out #4</p> <p>Inadequate Water Supply</p> <ol style="list-style-type: none"> 1. The amount of water available is always a critical factor. It must be evaluated for reliability, flow and total amount available. Confirm with dispatch that it is permissible to use the water source you have chosen. 2. The flow from area hydrants will probably stop or will have severely reduced pressures due to the great demand placed on them. 3. DO NOT rely on hydrants as your sole water source. Locate and identify additional water sources like swimming pools, ponds, etc. Obtain permission to use these alternate water sources. Consider water tenders if available. 4. Know your usable water tank capacity and pump capability. Steep inclines will affect them. 5. Do not waste water. Do not wet down roofs or ground fuels in advance of the fire front. Timing of water use is critical. Pretreatment with foam agents or fire resistant blankets can be beneficial. 	<p>05-21-S231-EP</p>

OUTLINE	AIDS & CUES
<ol style="list-style-type: none"> 6. DO NOT pass up an opportunity to “top off” your water tank (garden hose). 7. ALWAYS keep the last 100 gallons or 1/4 tank of water for the protection of your engine and personnel. 	
<p>E. Wildland/Urban Watch Out #5</p>	
<p>Natural Fuels 30 Feet or Closer to Structures</p>	<p>05-22-S231-EP</p>
<p>Fuels that are next to or beneath the structure (downslope) create a ladder. Closed canopy can have ladder fuels. This creates a situation where structure survivability is low and presents a high risk to firefighter safety.</p>	
<ol style="list-style-type: none"> 1. No safety zone for structure or personnel and do not have the ability to establish a safety zone. Lack of defensible space. 2. Pre-position engine(s) and/or vehicle(s) downhill or facing out the driveway for easy egress. 3. A common practice by residents is to stack highly flammable firewood next to structures. 4. Structure(s) is in the path of least resistance, e.g., saddles, chimneys, chutes. 5. Fire could make several runs at any structure. 	

OUTLINE	AIDS & CUES
<p data-bbox="284 283 836 319">F. Wildland/Urban Watch Out #6</p> <p data-bbox="378 373 1122 499">Structures in Chimneys, Box Canyons, Narrow Canyons, or on Steep Slopes (30% or greater).</p> <p data-bbox="378 552 1127 678">Home sites with a view are structures that have the lowest survivability and the highest safety risk to firefighting personnel.</p> <ol style="list-style-type: none"> <li data-bbox="386 730 1117 808">1. Structures are a path of least resistance for heat and smoke. <li data-bbox="386 863 1117 1213">2. Box or narrow canyons: <ul style="list-style-type: none"> <li data-bbox="475 951 1047 1029">• Wind direction normally follows direction of the canyon. <li data-bbox="475 1087 1112 1213">• Radiant heat transfer from one slope to another is great. Fire easily spots across the canyon. <li data-bbox="386 1266 1117 1661">3. Steep slopes in flashy fuels: <ul style="list-style-type: none"> <li data-bbox="475 1354 1063 1480">• Accelerated rate of spread due to increased heat transfer through radiation and convection. <li data-bbox="475 1533 1117 1568">• Spot fires can out flank the main fire. <li data-bbox="475 1621 1088 1656">• Burning materials can roll downhill. 	<p data-bbox="1157 373 1385 409">05-23-S231-EP</p>

OUTLINE	AIDS & CUES
<p>A no win situation. Because of the nature of topography and the potential for erratic fire behavior, fire suppression personnel are put in multiple Watch Out Situations. The high safety risk and chances for firefighter entrapment creates a lack of defensible space.</p> <p>4. Personnel safety concerns:</p> <ul style="list-style-type: none"> • Chances of entrapment are extremely high. • Departure (egress) becomes a problem. • High rate of spread. • Gusty erratic winds, spotting. • Lack of good safety zones. • Fire can make several runs at structures. <p>G. Wildland/Urban Watch Out #7</p> <p>Extreme Fire Behavior</p> <p>A fire that burns with an intensity far out of proportion to apparent burning conditions. It will multiply its rate of energy output many times in a short period of time.</p>	<p>05-24-S231-EP</p>

OUTLINE	AIDS & CUES
<p>These fires have been responsible for major loss of life and property within the wildland/urban interface.</p> <p>Extreme fire behavior can exist under the following conditions:</p> <ol style="list-style-type: none"> 1. Fuels are dry and plentiful 2. The atmosphere is either unstable or has been unstable for some hours, and possibly days, prior to the fire. 3. The speed of the free air usually is greater than 18 miles per hour, at an elevation equal to, or not much above, the elevation of the fire. <p>Note: A few dangerous and erratic fires have occurred when the wind speed was not especially high.</p> <ol style="list-style-type: none"> 4. Some effects of extreme fire behavior are: <ul style="list-style-type: none"> • Long and short distance spotting. • Fire whirlwinds 5. The extreme fire behavior will create a complex fire situation. Factors that create safety hazards and limit the effectiveness of firefighting resources are: <ul style="list-style-type: none"> • Safe paths of departure for personnel may be in jeopardy if conditions worsen. 	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • The risk of being outflanked is high. • The use of air attack becomes unlikely. • Gusty and erratic winds will affect effectiveness of fire retardant. • Peak burning conditions may not yet have arrived. • The overpowering temptation to hurry on the flanks. <p>Keep mobile and flexible in your firefighting efforts. You should not commit yourself or other resources to become fixed at a single water source. Do not allow other vehicles to block your escape routes.</p>	
<p>H. Wildland/Urban Watch Out #8</p> <p>Strong Winds</p> <p>Mostly a tactical problem to firefighting resources.</p> <ol style="list-style-type: none"> 1. Causes fire to increase rate of spread. <ul style="list-style-type: none"> • The head and flanks will become too active. • Could cause all levels of the fuel bed to become active, e.g., ground, aerial, canopy. • Unburned islands of fuel will remain. 	<p>05-25-S231-EP</p>

OUTLINE	AIDS & CUES
<ol style="list-style-type: none"> 2. The angle of the flame in relation to fuel is closer. 3. Velocity supplies oxygen to fire; carries sparks and burning fuel ahead of fire to start spot fires (spotting). 4. Wind driven fires have minimal backing spread rates. 5. Wind driven fires have an elliptical shape with a narrow head and often develop fingers. Complexity increases when the fire develops two heads or more. 	
<p>I. Wildland/Urban Watch Out #9</p> <p>Evacuation of Public</p> <p>The basic reason to evacuate:</p> <p>To guarantee residents a safe and orderly egress from a fire threatened area, prior to the arrival of the fire front. This allows fire personnel to concentrate on fire operations and personal safety.</p> <p>Considerations:</p> <ol style="list-style-type: none"> 1. Evacuation is controversial. Law enforcement agencies are disinclined to force residents to evacuate. During initial attack, minimal lead time creates more of a fear flight than an orderly evacuation. 	<p>05-26-S231-EP</p>

OUTLINE	AIDS & CUES
<p>2. During large fire scenarios with a command structure:</p> <ul style="list-style-type: none"> • Contingency plans are prepared before evacuations. • The incident management team holds briefings about the fire situation for the general public. <p>3. During evacuations remaining law enforcement personnel may lack the training and personal protective equipment for firefighting.</p> <ul style="list-style-type: none"> • Brief them or place a firefighter with them with communications. • Do not place law enforcement personnel in extreme fire situations. 	
<p>IV. ADDITIONAL WILDLAND/URBAN WATCH OUTS</p>	<p>05-27-S231-EP</p>
<p>REFER TO INCIDENT RESPONSE POCKET GUIDE, “POWER LINE SAFETY”</p>	<p>IRPG</p>
<p>A. Working Around Power Lines</p> <p>1. Downed conductor (line) on vehicle:</p> <ul style="list-style-type: none"> • DON’T leave vehicle until power company arrives. • If the vehicle is on fire or fire is near, jump clear. 	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • DON'T hang on; keep feet together and bunny hop away. <ol style="list-style-type: none"> 2. Beware of water or liquids pooled or running along the surface. Liquids are good conductors. 3. Use extreme caution when working around chain link or other metal fences. Downed lines can charge an entire section of fence line. 4. DON'T: <ul style="list-style-type: none"> • Operate heavy equipment under power lines. • Use power line right-of-way for a drop point. • Drive with long antennas under power lines. • Fuel vehicles under power lines. • "Spot" or park near pole mounted transformers. Arcing lines may cause them to explode. • Go near or move downed lines. • Squirt foam or water on power lines. • Stand or work in dense smoke near power lines. The potential for arcing is high. 	

OUTLINE	AIDS & CUES
<p>B. Petroleum or Propane Tanks are Present</p> <ol style="list-style-type: none"> 1. Many rural home sites have liquefied petroleum gas (LPG) for heating. 2. Check all storage tanks for LPG and check for 30 foot clearance of vegetation around storage tanks. Check tanks for physical damage to the tank; damage could cause the tanks to explode when heated. 3. Check outbuildings, barns for flammable liquid storage. 4. Identify and mark all hazards with flagging or other warning devices. Post a lookout. 5. Keep your supervisor informed of hazards. 	
<p>HAVE THE STUDENTS REFERENCE THE WILDLAND FIRE SUPPRESSION TACTICS REFERENCE, INCIDENT RESPONSE POCKET GUIDE, AND FIRELINE HANDBOOK. REVIEW THE STRUCTURAL WATCH OUTS THERE. DISCUSS ANY ADDITIONAL WATCH OUTS NOT PREVIOUSLY COVERED.</p>	<p>WFSTRG, IRPG, FHB</p>
<p>C. Out Buildings</p> <p>Could contain hazardous materials, e.g., meth lab.</p>	
<p>EXERCISE 2, WILDLAND/URBAN INTERFACE. HAVE STUDENTS IDENTIFY THE HAZARDS OBSERVED ON THE EP SLIDES. EACH GROUP IS TO RECORD THEIR OBSERVATIONS ON A FLIP CHART AND THEN PRESENT TO THE CLASS. ALLOW 20 MINUTES FOR THIS EXERCISE.</p>	<p>05-28-S231-EP 05-29-S231-EP 05-30-S231-EP thru 05-33-S231-EP 05-34-S231-EP</p>

OUTLINE	AIDS & CUES
<p>V. SUMMARY</p> <p>Structure Defense and Safety of Personnel and Equipment:</p> <p>A. Consider the orientation and the length of the fire front as it moves toward the structure.</p> <p>B. Try to estimate the length of time an engine will be committed at one location.</p> <p>A rough guide is 10 to 15 minutes minimum commitment time. The heavier the fuel type the longer an engine will be committed.</p> <p>C. Consider access/egress and escape routes/ safety zones.</p> <p>D. The vulnerability of a structure depends on the fire intensity and on the placement and construction of the structure itself.</p> <p>E. Building openings provide entry points for fire and fire brands.</p> <p>F. After assessing the fire you should know:</p> <ul style="list-style-type: none"> • The time before the fire front arrives. • The distribution and number of structures to be protected. • The vulnerability of structures to be protected. 	<p>05-35-S231-EP</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> • ETA of resources that will be committed to a site. • Access and escape routes; potential problem areas. • Suppression and defense tactics. <p>G. Ensure adequate communications are established and maintained with all agencies involved. (LCES)</p> <p>H. Have a command system, with a group supervisor or incident commander.</p> <p>I. If resources are mixed, it may be best to place wildland engines in those assignments requiring the most involvement with wildland fire such as: perimeter positions, firing operations, etc. Do not position your engine where it might get stuck.</p> <p>J. Where water tenders are the main water supply and when refill times are not extreme, it will take two tenders to supply enough water for one or two active strike teams.</p> <p>K. Think about evacuation if necessary.</p> <p>L. Follow your Risk Management Process, Structure Assessment Checklist, Structure Protection Checklist, LCES Checklist, etc.</p> <p>M. <i>Safety is of primary importance</i>, life number one, property number two.</p>	<p>IRPG</p>

OUTLINE	AIDS & CUES
REVIEW UNIT OBJECTIVES AND DISCUSS. REVISIT STUDENT EXPECTATION LISTS. COMMENT ON HOW THESE WERE ACCOMPLISHED OR HOW THEY MAY BE ACCOMPLISHED IN THE FUTURE.	05-36-S231-EP

DETAILED LESSON OUTLINE

COURSE: Engine Boss (Single Resource), S-231

UNIT: 6 - Final Examination

SUGGESTED TIME: 1 Hour

TRAINING AIDS: Personal computer with LCD projector and presentation software or overhead projector.

OBJECTIVES: Upon completion of this unit, the student will be able to:

Obtain 70% or higher on the final examination to pass the course.

OUTLINE	AIDS & CUES
<p>ADMINISTER THE FINAL EXAMINATION.</p> <p>A COPY OF THE FINAL EXAMINATION AND FINAL EXAMINATION WITH ANSWERS IS PROVIDED IN APPENDIX C, EVALUATIONS.</p> <p>Inform the students they will have one hour to complete the final examination. They should feel free to use the Fireline Handbook, Incident Response Pocket Guide, Wildland Fire Suppression Tactics Reference Guide, and any of their hand written notes. For completion of the final examination, exercise solution sheets will not be allowed.</p> <p>There are 100 possible points on the final examination. If an answer is reasonable, credit will be given. In cases where a question is unclear, justification written beside the answer may also be given credit at the discretion of the instructor.</p>	<p>06-01-S231-EP 06-02-S231-EP</p>

DETAILED LESSON OUTLINE

COURSE: Engine Boss (Single Resource), S-231

UNIT: 7 - Field Exercise

SUGGESTED TIME: 3-4 Hours

OBJECTIVES: Upon completion of this unit, the student will be able to:

1. Obtain essential information from the Incident Commander and brief crewmembers and adjoining forces.
2. Maintain LCES and standard safety procedures.
3. Participate in an After Action Review.

OUTLINE	AIDS & CUES
<p>THIS EXERCISE IS INTENDED TO BE NONSPECIFIC TO ALLOW THE CADRE THE FLEXIBILITY TO LOCALIZE THE SCENARIO. THE CADRE WILL HAVE THE LATITUDE TO MAKE THIS EXERCISE AS COMPLICATED OR SIMPLISTIC AS THEY WISH ALLOWING FOR THE ACCOMPLISHMENT OF THE OBJECTIVES.</p> <p>PROVIDED AS WELL ARE SAMPLE TACTICAL DECISION GAME SCENARIOS THAT CAN BE FACILITATED WITH A SAND TABLE OR TOPOGRAPHIC MAP.</p>	07-01-S231-IR

OUTLINE	AIDS & CUES
<p>I. FIELD EXERCISE</p> <ul style="list-style-type: none"> A. Set up a 5 acre fire perimeter in light fuels; use orange metal wire flags. The flags bend down when hit with water stream; flags left standing simulate fire edge that was not extinguished. B. Scenario recommends a mobile attack with engines; may substitute with hose lays or other tactics if mobile is not feasible. C. First engine on scene assumes role of ICT4. D. I.C. chooses appropriate tactic; manages incident safely by following standard operating guidelines, e.g., Fire Orders, Watch Out Situations, Risk Management Process, LCES. E. Must recognize/identify the difference between safety zones/deployment zones. F. Cut and run escape to safety zone scenario as part of the exercise. <p>Specifics on scenario: fire behavior, weather conditions, fuel types, models, etc. Available resources to be determined and developed at each local area by local cadre.</p>	

OUTLINE	AIDS & CUES
<p>G. Suggestions to enhance exercise:</p> <ul style="list-style-type: none"> • Use enough water and available resources to require resupply, e.g., drafting, getting more hose. • Occurrence of spot fires. • Irregular fire perimeters. • Equipment failure. <p>H. Evaluation of exercise:</p> <ul style="list-style-type: none"> • Use after action review (AAR)/debriefing format to evaluate exercise. • Use criteria above to facilitate discussion. • ICT4 will conduct AAR with cadre assistance. <p>REFER TO INCIDENT RESPONSE POCKET GUIDE (IRPG) FOR AAR CHECKLIST.</p>	
<p>II. TACTICAL DECISION GAMES</p> <p><u>Directions:</u></p> <p>A. Introduce the scenario. Avoid reading, issue as briefing. Maintain eye contact with students.</p> <p>B. Anticipate and answer reasonable additional questions, but do not prolong scenario briefing.</p> <p>C. Signal start of time limit.</p>	<p>07-01-S231-IR</p>

OUTLINE	AIDS & CUES
D. Are you still answering questions or “coaching”? Stop it!!	
E. Signal time is up.	
F. Select a player to provide a solution, do not rely on volunteers.	
G. Direct selected player to issue decision as instructions to other players assigned to “subordinate roles.”	
H. Is the decision being delivered as instructions? No theoretical or conceptual “would have” “should have” or “could have” discussions allowed!	
I. After instructions have been issued, check role-playing subordinates’ feedback to ensure instructions were understood.	
J. Select players for additional solutions, repeating process.	
K. Question the thought process. Ask: <ul style="list-style-type: none"> • why did you do this or that? • what was your situational assessment? • what would you have done if...? • what were your assumptions about the situation? • what is your biggest concern about your plan? 	
L. Are you dominating the discussion? Stop it!	

OUTLINE	AIDS & CUES
<p>M. Are you managing the entire group? Make sure all players are engaged!</p> <p>N. Draw out lessons. Summarize and accentuate them. Facilitate and moderate constructive criticism and encourage debate.</p> <p>O. Resist offering “Your Solution” unless that is the best avenue for a positive lesson. Your influence could wrongly infer there is a “right” answer and inhibit independent solutions.</p> <p>P. Conduct an after action review (AAR) in the individual groups. Have the students select a spokesperson to present their findings. Have each group present their findings to the class.</p>	

S-231 TACTICAL DECISION GAME

EXERCISE

OBJECTIVE:

THE ENGINE BOSS MUST DECIDE HOW THE ASSIGNMENT OR SITUATION CAN BE SAFELY APPROACHED AND THE BEST METHOD OF ATTACK OR COURSE OF ACTION CONSIDERING ALL EXISTING CIRCUMSTANCES. VERBALLY COMMUNICATE THE DECISION TO THE APPROPRIATE INDIVIDUALS. *THE OBJECTIVE SHOULD NOT BE REVEALED TO EXPERIENCED PLAYERS.*

SCENARIO: Your position is Engine Boss on a Type 5 engine (2WD), and you are currently responding to a fire report on your district. It is the beginning of the fire season and you have only been with your crewmembers for 2 weeks. One person has one full season of fire experience, and the other is brand new. The initial report indicates a fire in grass and brush, on flat terrain, and with no estimate of acreage. The weather forecast for the day calls for temperature in the high 80's, relative humidity in the 20's, winds to 15 mph. out of the southwest, and a Haines Index of 4. You were dispatched @ 1300.

Your engine is the first ground resource to reach the fire.

As you arrive at the fire location you notice:

- You did not see any accessible water sources on the way to the fire.
- Fire is 10-15 acres, active at the head and running to the northeast. The flanks show only moderate activity.
- Wind is out of the southwest 10-15mph, and indicators appear it will remain constant.
- Terrain at the origin is relatively flat, but turns into rolling hills and mountainous terrain with heavier fuel (brush and timber) to the north.
- The local fire operations specialist (FOS) has been dispatched as Incident Commander (IC), but informs dispatch he is 20 minutes away, on the other side of the district.
- You can see no structures in the immediate area that appear to be threatened.
- Another engine (Type 6 4X4) arrived on scene about the same time you did.

- A type 5 engine arrives 1/4 hour after you did.

Given this information the chosen Engine Boss from each group needs to:

- Describe who to coordinate with, what questions to ask, and which decisions are the immediate priorities.
- Determine the best method of attack and where to place resources.
- Describe your contingency planning process.

2. Time - 1500

Scenario: You have secured line on the left flank with two other engines as far as you could drive into the hills. Your engine and another Type 5 have started a hose lay up the hill, and the Type 6 engine is patrolling the line looking for slopovers and spots. Three other engines have arrived and are working the left flank. The IC calls to inform you that a strike team of contract engines coming in shortly to take over your section of line. He would like you and the other two engines you're with to move to another part of the fire and assist with structure protection. (At this point, the IC is using you as the contact point for the three engines). The fire has burned toward the northeast from Banks Rd. into the mountains, and is threatening a small group of cabins. The IC is currently with the assistant fire management officer (AFMO) and line officer, discussing staffing and tactics, but will be on the way to the cabin site as soon as possible. There is a resource advisor presently at the cabin site coordinating the situation.

Your engine is having trouble idling and quits running.

The wind has picked up with gusts of 20 mph, and your last weather reading indicated a temperature of 91 degrees Fahrenheit, and an relative humidity of 18%.

- Given this situation, list what other information you would want to have before proceeding with the order.
- Are there any other communication and coordination issues that need to be solved?
- Are there any changes in your contingency planning?
- How will you brief your crew?

3. Time - 1530

Scenario: You finally get your engine started and it seems to be running OK. The air cleaner was very dirty. The strike team of contract engines has arrived and you depart for the cabin site after you complete a thorough transition briefing that the IC strongly recommended. You are beginning to feel stressed by the delay in your departure. As your engine arrives in the cabin area you observe the following:

- The cabins are located in a forested area with some dense undergrowth. You do notice some open, green meadows in the area.
 - Roads between various cabins are narrow and winding.
 - There are 3 or 4 rural volunteer engines of different types scattered around different cabins.
 - The resource advisor appears to have little or no training and experience in wildland fire, and is busy trying to contact the local residents to get them to leave the area. A law enforcement officer is also in the area assisting in evacuations. He tells you he believes there are 15 cabins in the group.
 - The IC has been delayed as well, and is still 15 minutes from arriving. He believes the fire is still 1/2 mile away burning toward the cabin site. You only see a large column of smoke and the wind is blowing it in your direction.
- Do you have enough information to safely take on this assignment? If not, what are some other sources you could inquire or refer to?
 - What communication and coordination issues need to be resolved?
 - How would you brief your crew
 - What new contingency issues have arisen?

4. Time - 1630

Scenario: After scouting the area and triaging several cabins, you and the other type 4 engine find one with good defensible space, good parking spot and a water source. The water source is a well, and the cabin owner (who does not want to leave) tells you it is reliable. The IC has arrived in the area, but you have not talked to him face to face yet. The fire is getting closer to the cabin site and the fire intensity is high with short range spotting. Air attack and a type one air tanker are working putting in retardant drops in the area. There is a Type 3 helicopter working in the area doing bucket work. Over the radio, you understand that another heavy air tanker is in route.

- If your engine stays at this cabin site to protect it what other major concerns do you have other than the ones stated?
 - What strategy and tactics would you employ to defend the structures?
 - Describe your risk analysis process.
 - If you decide not to defend any of the cabins what procedures would you follow?
 - Describe your risk analysis process.
 - What new contingency issues have surfaced for both possibilities?

5.

Scenario: You decide to stay and defend the cabin site. The owner of the cabin is still there. You feel you can save the structures and maintain LCES. The IC decides that the conditions are too dangerous overall and orders: “ All units in the area of Banks Cabin Tract pull out. Proceed back to the main road and meet at the rest area at Mile Marker 117.”

What is your response???

S-231, ENGINE BOSS

APPENDIX A

Course Ordering Information

COURSE ORDERING INFORMATION

ENGINE BOSS (Single Resource), S-231 is available for purchase through:

National Interagency Fire Center
Attention: Great Basin Cache Supply Office
3833 South Development Avenue
Boise, ID 83705-5354

Consult the latest NWCG National Fire Equipment System Catalog, Part 2: Publications, NFES 3362 to obtain current ordering procedures and prices.

Necessary components for presentation for the course include:

NFES 1400 S-231 Instructor Guide
NFES 1402 S-231 CD-ROM Course Materials

Each student will need to be provided the following:

NFES 1401 S-231 Student Workbook

Send to each student the following with the selection letter:

NFES 1256 Wildland Fire Suppression Tactics Reference Guide

Each student is encouraged to bring to class:

NFES 2318 Single Resource Boss Position Task Book
NFES 0065 Fireline Handbook
NFES 1077 Incident Response Pocket Guide

