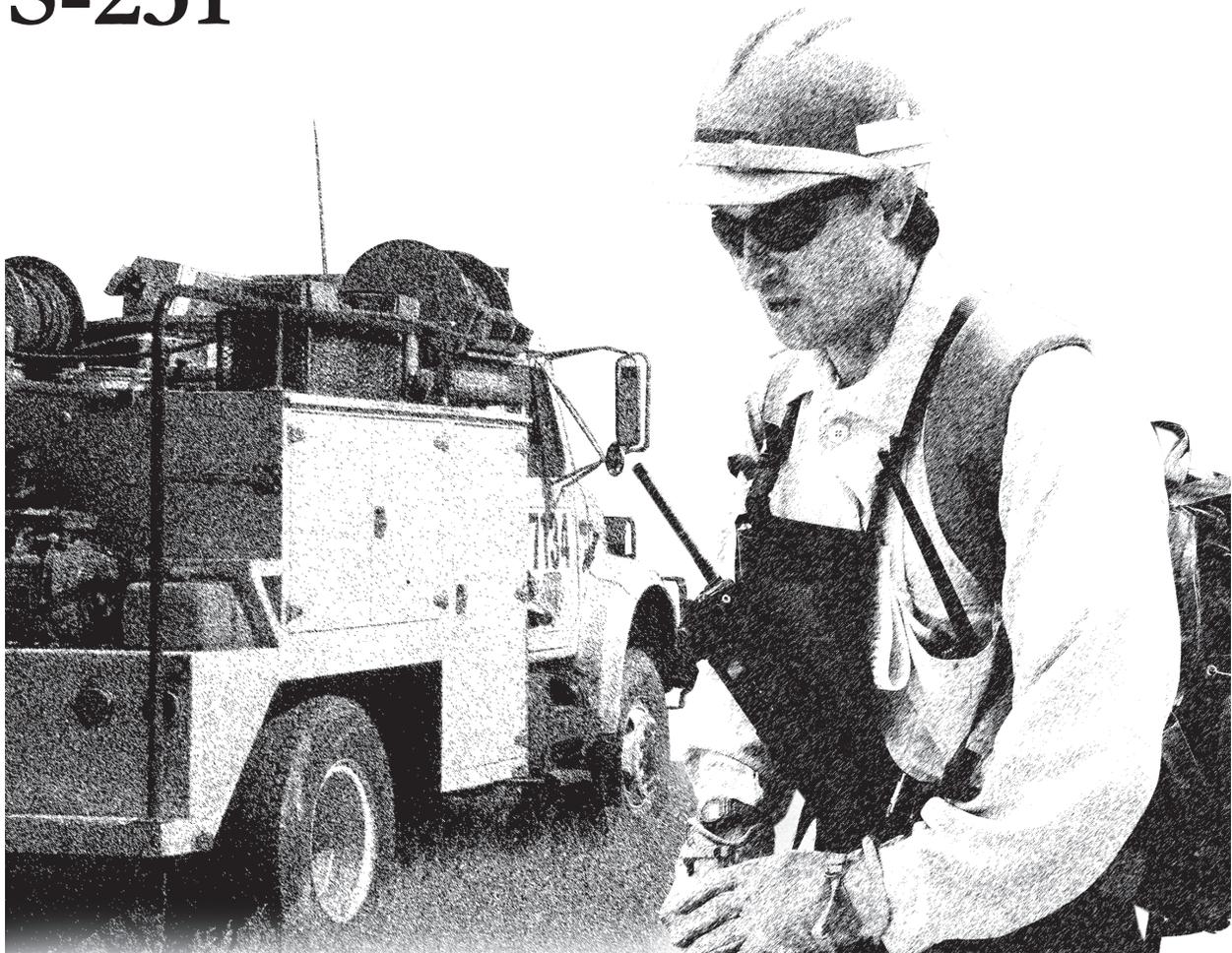


# Engine Boss (Single Resource) (Blended) S-231



NFES 002971

**Instructor Guide**  
**JANUARY 2012**



## CERTIFICATION STATEMENT

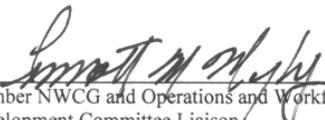
on behalf of the

### NATIONAL WILDFIRE COORDINATING GROUP

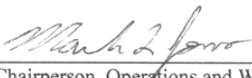
*The following training material attains the standards prescribed for courses developed under the interagency curriculum established and coordinated by the National Wildfire Coordinating Group. The instruction is certified for interagency use and is known as:*

Engine Boss (Single Resource) (Blended), S-231  
Certified at Level I

This product is part of an established NWCG curriculum. It meets the requirements of the NWCG Curriculum Management Plan and has received a technical review and a professional edit.

  
Member NWCG and Operations and Workforce  
Development Committee Liaison

Date 1.31.2012

  
Chairperson, Operations and Workforce Development  
Committee

Date 1/27/12

# **S-231, Engine Boss**

## **(Single Resource)**

### **(Blended)**

**Instructor Guide**  
**JANUARY 2012**  
**NFES 002971**

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Comments regarding the content of this publication should be directed to National Interagency Fire Center, Training Branch, 3833 South Development Avenue, Boise, Idaho 83705.  
Email: [BLM\\_FA\\_NWCG\\_Evaluation@blm.gov](mailto:BLM_FA_NWCG_Evaluation@blm.gov)

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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 publication number: NFES 002971

## **NWCG OPERATIONS AND WORKFORCE DEVELOPMENT COMMITTEE POSITION ON COURSE PRESENTATION AND MATERIALS**

The recommended hours listed in the FMCG 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 may vary slightly due to factors such as number of students, types and complexity of course activities, and the addition of local materials.

NWCG does not approve of course delivery varying greatly from the recommended course hours. Instructors and students are cautioned that in order to be recognized as an NWCG certified course, certain guidelines must be followed:

- 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 either by accessing the online feedback form at [training.nwcg.gov](http://training.nwcg.gov) or e-mail to NWCG Training at [BLM\\_FA\\_NWCG\\_evaluation@blm.gov](mailto:BLM_FA_NWCG_evaluation@blm.gov). Materials submitted will be evaluated and, where and when appropriate, incorporated into the appropriate courses.

### **COURSE LENGTH FOR NWCG COURSES**

Recommended course hours and the “NWCG Position on Course Presentation and Materials” above will be adhered to by the course instructors (see below for exception for criteria based courses).

- Unit times represent the allotted time to teach the unit and complete the exercises, simulations, and tests.
- Recommended course hours are given to help the students and the course coordinator with planning travel, room reservations, and facilities usage. This represents the time estimated to present the NWCG provided materials including time for breaks, lunch periods, to setup for field exercises or simulations, etc.
- Actual times for both the unit and the course may vary based on number of students, types and complexity of course activities, and the addition of local instructional materials.

If the course is criteria based, 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 course instructors.

Course hours for all NWCG courses can be found in the Field Manager’s Course Guide at [www.nwcg.gov/pms/training/training.htm](http://www.nwcg.gov/pms/training/training.htm). If the hours are a minimum versus recommended, they will be stated as such.

## **PREFACE**

Engine Boss, S-231, is a required training course in the National Interagency Incident Management System: Wildland Fire Qualification System Guide (PMS 310-1). This course was developed by an interagency group of subject matter experts with direction and guidance from the National Wildfire Coordinating Group (NWCG) Training Branch. The primary participants in this development effort were:

**BUREAU OF LAND MANAGEMENT**

**NATIONAL PARK SERVICE**

**U.S. FOREST SERVICE**

**NWCG TRAINING BRANCH**

Distance Learning Unit  
Instructional Media Unit  
Evaluation Unit  
Development Unit

**ICF INTERNATIONAL**

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



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## COURSE INSTRUCTIONS

**This section contains instructions and information essential to the course coordinator and instructors in making an effective presentation. Cadre members must read this section and be thoroughly familiar with course procedures and material prior to presentation.**

### I. INTRODUCTION

The S-231 Engine Boss course is designed to meet the training needs of an Engine Boss, Single Resource (ENGB) on an incident as outlined in the Wildland Fire Qualification System Guide (PMS 310-1) and the Position Task Book developed for this position. The Wildland Fire Qualification System Guide provides guidance and a national wildland fire standard for establishing minimum training, skills and knowledge, experience, and physical fitness requirements for the participating agencies of the National Wildland Fire Coordinating Group (NWCG).

This S-231 course was developed using a blended approach to learning, meaning that it contains a mix of online and instructor-led training (ILT). Students were required to complete the online training portion of the course and pass an online assessment prior to taking the ILT. The focus of this online training was to teach knowledge and concepts. The ILT will reinforce the content learned online and provide opportunities to apply this knowledge to real-world scenarios and practical exercises. Upon completion of the ILT, students must then take and pass a final assessment in order to receive credit for the course. The final assessment covers content from both the online and ILT portions of the course.

To ensure the most up-to-date material is being presented, instructors are encouraged to refer to the NWCG Training and Qualifications Web site. This Web site contains current updates for all NWCG courses. Go to <http://training.nwcg.gov/>, and select the course you will be coordinating or instructing.

### II. COURSE OBJECTIVE

The course objective is stated in broad terms that define what students will be able to accomplish after completing the course. The objective is addressed in both the online and ILT portions of this course.

At the successful completion of this course, students will be able to:

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

### III. INSTRUCTOR PREREQUISITES

Refer to the Field Manager's Course Guide (PMS 901-1) for instructor prerequisites specific to this course. This guide is accessible at <http://www.nwcg.gov/pms/training/training.htm>.

This is a 200-level course. In addition to the course specific instructor prerequisites, all instructors are required to have 32 hours of instructor training, such as Facilitative Instructor (M-410) or an equivalent course, as stated in the Field Manager's Course Guide.

### IV. INSTRUCTOR PREPARATION/COURSE COORDINATION

#### A. General Information

The Course Coordinator's Guide (PMS 907) contains general information for presentation of NWCG courses. The course coordinator and instructors should be thoroughly familiar with this guide (online at <http://www.nwcg.gov/pms/training/training.htm>).

#### B. Exercises and Other Pertinent Information

The material in this course is designed to be presented through a series of facilitated discussions and classroom exercises, including a review of the content in the online portion of the course and a tactical decision game. The instructors must work through the exercises together and agree upon the solutions. The instructors should also review the final assessment to ensure that all material is covered.

Students will be formed into groups for the exercises in this course and intermixed according to experience level and geographic location of their home unit. Due to the nature of the exercises in this course, seating should allow for ease of discussion and interaction among the students.

Unit 1 provides the student an opportunity to not only review their knowledge, but to also apply that knowledge to real-world situations. The unit contains a brief review of online modules 1-6 and an instructional game, Engine Boss Fundamentals. The Engine Boss Fundamentals is a game show-style review with graphics and scenarios.

Unit 2 includes two different small group exercises. The first is an exercise and discussion that contains four different scenarios and the use of maps to illustrate the scenario. The second is a tactical decision game that contains a scenario that builds throughout the exercise. Adequate space is needed so student groups will not be able to overhear adjacent discussions. The lead instructor/course coordinator will need to ensure an adequate amount of facilitators are available for each scenario station.

Consider using sand tables or Google Earth to add depth to the scenarios. For information on facilitating sand table exercises (STEX), refer to the Tactical Decision Games Library on the Wildland Fire Leadership Development Program Web site (online at [http://www.fireleadership.gov/toolbox/TDG\\_Library/default.htm](http://www.fireleadership.gov/toolbox/TDG_Library/default.htm)).

## V. COURSE MATERIALS

See Appendix A – Course Ordering and Support Information.

### A. Instructor Guide

The Instructor Guide is designed as a teaching aid to assist instructors in presenting the information. Each unit begins with a Unit Overview that outlines the lesson's approximate delivery time, objectives, learning strategy, instructional methods, required materials, and evaluation criteria.

The lesson plan for each unit is organized in a two-column format:

- The Outline column contains the lesson content that supports the learning objectives. This column also contains notes to the instructor (directions for conducting an exercise, questions to ask students, etc.).
- The Aids & Cues column lists references (slide numbers, handouts, publications, etc.) that remind instructors to display or refer to specific materials.

B. Course Materials CD-ROM

The CD contains complete copies of the Instructor Guide, Student Workbook, and Appendixes in bookmarked files in portable document format (pdf).

C. Student Workbook

Student Workbooks should be ordered prior to the beginning of the course, one for each student.

D. Course Agenda

A sample course agenda is on page 13. Revise the agenda as appropriate. The agenda can be inserted into the Student Workbook prior to the beginning of class.

## VI. STUDENT TARGET AUDIENCE

This course is required training for all personnel desiring to be qualified as an Engine Boss, Single Resource. The target audience for this course includes the following:

- NWCG Federal and state wildland firefighters
- Municipal, rural, and volunteer fire departments

## VII. STUDENT PREREQUISITES

Students must be qualified as a Firefighter Type 1 (FFT1), have successfully completed the online portion of S-231, and have completed the S-230 Crew Boss (Single Resource) course as well as all prerequisites for that course.

It is important to note that taking this course does **not** qualify students as an Engine Boss, Single Resource.

Refer to the Field Manager's Course Guide (PMS 901-1) for current course prerequisites.

## VIII. COURSE NOMINATION LETTER

Send a nomination letter, along with the information about completing the required online course modules, to students at least 6 weeks before the ILT portion of the course begins. Consider a cutoff date at least 2 weeks prior to the ILT to allow for technical or unforeseen issues with students related to the online course modules. The letter will contain information on where to access the online modules. An example of the course nomination letter is located on page 9.

## IX. COURSE SELECTION LETTER

A selection letter will need to be sent to students who successfully complete the online portion of the course. An example of the course selection letter is located on page 11. This letter will contain the class start time, location, etc.

## X. CADRE MEETINGS

Cadre meetings are an opportunity for instructors to meet, review the material, and discuss concerns with the course coordinator or lead instructor. The meetings are critical for instructors who do not have previous experience with the course.

After each day's presentation, hold a cadre meeting to discuss concerns and progress. At the end of the course, conduct a final cadre meeting to evaluate instructor performance and suggest modifications for future courses.

A cadre meeting in advance of the course presentation is suggested due to the relationship of the unit material (changing instructional materials in one unit may impact a later unit).

## XI. RECOMMENDED CLASS SIZE

The recommended class size is 30 students. Cadre members should be present for all instructional sessions. A minimum of two instructors should present this course.

## XII. SPACE AND CLASSROOM REQUIREMENTS

The characteristics of the classroom and supportive facilities have a great impact on the learning environment.

The following characteristics should be considered when choosing a location and classroom:

- Provide adequate room and flexibility for student work groups and equipment, including supportive facilities such as break areas, restrooms, etc.
- The classroom should be free from outside interruptions and interferences.
- The classroom should have controlled lighting, good acoustics, and good ventilation.
- Provide adequate access to copy and printing services.
- A computer with projector and screen is needed to accommodate electronic presentations. Test the equipment prior to beginning class to ensure compatibility with software. Consider projecting onto a whiteboard, which will allow drawing using dry erase marker overlay directly onto the projected map for the scenarios in Unit 2.
- An area for sand tables and demonstrations appropriate for field exercises may be needed (cadre's discretion).

Refer to the Course Coordinator's Guide (PMS 907) for more information.

### XIII. STUDENT ASSESSMENT

The students' performance will be evaluated by the following methods:

#### A. Exercises and Quizzes

Exercises and quizzes are designed to demonstrate students' ability to meet lesson objectives. They are not graded, but should be discussed upon completion by the entire class.

#### B. Final Assessment

Students must obtain a score of 70% or higher on the final assessment to receive a certificate of completion for this course. A copy of the final assessment can be found in Appendix C – Student Assessment.

### XIV. CERTIFICATION

Upon successful completion of the online and ILT portions of the S-231 Engine Boss course, the student will receive a final certificate of completion from the instructor. This certificate indicates the student's successful completion of the training course only and does not qualify them as an Engine Boss, Single Resource. If the student wishes to become qualified as an Engine Boss, Single Resource, as stated in the Wildland Fire Qualification System Guide, they must complete the tasks outlined in the position task book for Engine Boss, Single Resource.

### XV. COURSE EVALUATION FORMS

Copies of these forms are in Appendix D.

#### A. Training Course Evaluation Form

This is an opportunity for the course coordinator and instructors to comment on course design. These comments are used by NWCG Training to identify potential problems with courses and as a resource during the course revision process.

## B. Student Training Course Evaluation Form

This is an opportunity for students to comment on the course and the instructors for the purpose of improving future training sessions. Distribute the form at the beginning or end of the course.

Comments contained on these forms that will help to improve the course can be emailed by the course coordinator and/or lead instructor to [BLM\\_FA\\_NWCG\\_Evaluation@blm.gov](mailto:BLM_FA_NWCG_Evaluation@blm.gov).

## XVI. APPENDIXES

The following appendixes are on the Course Materials CD-ROM:

- Appendix A – Course Ordering and Support Information

This appendix identifies ordering procedures for required components of the course. It also lists additional support materials needed for course presentation.

- Appendix B – PowerPoint Presentations

- Appendix C – Student Assessment

- Appendix D – Course Evaluation Forms

**Engine Boss, S-231**  
*Sample Course Nomination Letter*

To: *Nominee*  
From: Course Coordinator or Lead Instructor  
Subject: Online Course Work for Engine Boss, S-231

You have been nominated to participate in the Engine Boss, S-231, course. This course focuses on the duties of an Engine Boss, Single Resource, as outlined in the Wildland Fire Qualification System Guide (PMS 310-1) and the associated position task book. This course is presented using a blended approach to learning, combining online and instructor-led training. The online portion will teach knowledge and concepts. The instructor-led training part of the course will reinforce the concepts learned online and provide opportunity to apply those concepts to real-life scenarios and practical exercises.

To attend S-231, you must be qualified as a Firefighter Type 1 (FFT1), have successfully completed S-230 Crew Boss (Single Resource) as well as all prerequisites for that course, and completed the online portion of the S-231 Engine Boss course before attending the instructor-led portion. To complete the online course modules, go to <http://training.nwcg.gov>. This will provide additional course information and a link to the National Fire Academy (NFA) Learning Management System (LMS), where the training is located.

You must pass the online assessment with a minimum score of 70% to attend the instructor-led portion of the S-231 course. Submit a copy of your certificate of completion from the online course modules as directed to *course coordinator* by *date*. You will then receive a course selection letter with further instructions for attending the instructor-led portion of the course.

Thank you for your interest in attending the S-231 course.

*Course Coordinator or Lead Instructor's Name*  
*Contact Information (e-mail, address, and phone number)*



**Engine Boss, S-231**  
*Sample Course Selection Letter*

To: *Student's Name*  
From: *Course Coordinator's Name*  
Subject: Engine Boss, S-231

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

The primary emphasis of this ILT portion will reinforce the content learned online and provide opportunities to apply this knowledge to real-world scenarios and practical exercises.

Please bring the following references to class:

- Single Resource Position Task Book (PMS 311-13) (initiated at the home unit)  
<http://www.nwcg.gov/pms/pms.htm>
- Fireline Handbook (PMS 410-1, NFES 0065)  
<http://www.nwcg.gov/pms/pubs/pubs.htm>
- Incident Response Pocket Guide (PMS 461, NFES 1077)  
<http://www.nwcg.gov/pms/pubs/pubs.htm>

If you wish 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 that you cannot attend the course, please contact the course coordinator prior to the beginning of the class. This allows time for notifying people who 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, and e-mail address*.



**Engine Boss, S-231**  
*Sample Course Agenda*

0800 Unit 0 – Introduction  
0830 Unit 1 – Engine Boss Fundamentals  
0930 Break  
0945 Unit 1 – Engine Boss Fundamentals  
1015 Unit 2 – Tactical Decisions  
1045 Break  
1100 Unit 2 – Tactical Decisions  
  
1200 Lunch  
  
1300 Unit 2 – Tactical Decisions  
1400 Break  
1415 Unit 2 – Tactical Decisions  
1545 Break  
1600 Student Assessment  
1700 Closeout  
1730 End of Session

*Cadre Meeting (Course Closeout)*



## UNIT OVERVIEW

**Course** Engine Boss, S-231

**Unit** 0 – Introduction

**Time** .5 Hours

### Objectives

1. Introduce the course coordinator, instructors, and students.
2. Discuss course logistics.
3. Present course overview.
4. Discuss course expectations.

### Strategy

This unit is designed to be team taught by the course coordinator and the lead instructor. The course coordinator should present the material in the detailed lesson outline in Section II, Course Logistics. The lead instructor should present the remainder of the material in the unit.

As a reminder, this course is a blended approach to learning, meaning that it contains a mix of face-to-face and online instruction. Students were required to complete this online training portion of the course and pass an online assessment prior to taking the ILT portion. The focus of this online training was to teach knowledge and concepts. The ILT portion will reinforce the content learned online and provide opportunities to apply this knowledge to real-world scenarios and practical exercises. Upon completion of the ILT portion, students must then take and pass a final assessment in order to receive credit for the course.

In this unit, it is important to remind students that the purpose of the ILT portion of the course is to apply the knowledge they obtained in the online portion. During the first part of the day, students will be working in groups to answer questions in a game called “Engine Boss Fundamentals.” The second part of the day is comprised of scenario-based exercises, which will provide students an opportunity to practice decision-making skills in a tactical context.

For the purposes of this course, it is important that groups are intermixed with students from different agencies and/or geographic areas; this will enable students to become familiar with one another and the agencies they represent.

Name cards should be prepared ahead of time and seats assigned to students to encourage this interaction.

### **Instructional Method(s)**

- Informal lecture
- Interactive group discussion

### **Instructional Aids**

- Computer with projector, PowerPoint software, and screen (consider a white board to project and draw on)
- Sign-in sheet
- Flip charts and markers
- Fireline Handbook (PMS 410-1, NFES 0065)
- Incident Response Pocket Guide (IRPG) (PMS 461, NFES 1077)
- Single Resource Boss Position Task Book (PMS 311-13)

### **Exercise(s)**

- Expectations

### **Outline**

- I. Introductions
- II. Course Logistics
- III. Course Overview
- IV. Course Expectations

### **Aids and Cues Codes**

The codes in the Aids and Cues column are defined as follows:

IG – Instructor Guide	IR – Instructor Reference
SW – Student Workbook	SR – Student Reference
HO – Handout	Slide – PowerPoint

## UNIT PRESENTATION

**Course** Engine Boss, S-231

**Unit** 0 – Introduction

OUTLINE	AIDS & CUES
<p><b>Present NWCG mission statement slide.</b></p> <p><b>Present course title slide.</b></p> <p><b>Welcome students to the course.</b></p>	Slide 0-1  Slide 0-2
I. INTRODUCTIONS	
<p><b>Introduce Course Coordinator and Instructors.</b></p> <p><b>For introductions use any method desired.</b></p> <p><b>Have students give their:</b></p>	Slide 0-3  Slide 0-4
<ul style="list-style-type: none"><li>• Name and job title</li><li>• Agency and home unit</li><li>• ICS qualifications</li><li>• Experience relative to the position as either a trainee or a trainer/coach, both positive and negative</li></ul>	

OUTLINE	AIDS & CUES
<p>II. COURSE LOGISTICS</p> <div style="border: 2px solid black; padding: 2px;"><b>Discuss as appropriate:</b></div> <ul style="list-style-type: none"><li>• Course agenda</li><li>• Sign-in sheet</li><li>• Housekeeping<ul style="list-style-type: none"><li>– Message and telephone location</li><li>– Cell phone and pager policy</li><li>– Facility locations (restrooms, vending machines, drinking fountains, smoking areas, evacuation policy, etc.)</li><li>– Local information (restaurants, local map, transportation)</li><li>– Computer use (no internet surfing, log on only when instructed, etc.)</li><li>– Punctuality, meals, and breaks</li></ul></li><li>• Other concerns</li></ul> <div style="border: 2px solid black; padding: 2px;"><b>Circulate the class registration form or a sign-in sheet for students to sign.</b></div>	<p>Slide 0-5</p>



OUTLINE	AIDS & CUES
<p>Note: Completing this course alone does not qualify students as an Engine Boss. Students will be required to complete a practical assignment and will not become an Engine Boss until qualified or “red carded” by an NWCG member agency or fire department.</p> <p>B. Instructional Methods</p> <ol style="list-style-type: none"> <li>1. “Fire-Away” game-show-style review of online course materials</li> <li>2. Discussion</li> <li>3. Tactical decision exercises</li> </ol> <p>C. Student Assessment</p> <p>To successfully complete the course, students must:</p> <ol style="list-style-type: none"> <li>1. Participate in the review of online course materials, all classroom discussions, and exercises.</li> <li>2. Achieve a score of 70% or higher on the final assessment.</li> </ol> <p>D. Course Evaluation Form</p> <p>Students are given the opportunity to comment on the course and the quality of the instruction.</p>	<p>Slide 0-8</p> <p>Slide 0-9</p>

OUTLINE	AIDS & CUES
<p>IV. COURSE EXPECTATIONS</p> <p>A. Student Expectations</p> <p><b>EXERCISE: Expectations</b></p> <p><u>Purpose:</u> Have students develop a list of their expectations for the course.</p> <p><u>Time:</u> 5 minutes</p> <p><u>Format:</u> Students work in small groups of 4 to 5.</p> <p><u>Materials Needed:</u> Flip charts and markers</p> <p><u>Instructions:</u></p> <ol style="list-style-type: none"><li>1. Instruct groups to write their responses to the following question on a flip chart:<ul style="list-style-type: none"><li>• What do you expect to gain from this course?</li></ul></li><li>2. When finished, have each group present their expectations to the class.</li><li>3. Answer any questions.</li><li>4. Post lists around the room and refer to them throughout the course to ensure students' expectations are being met.</li></ol> <p><b><u>End of Exercise.</u></b></p>	<p>Slide 0-10</p>

OUTLINE	AIDS & CUES
<p>B. Instructor Expectations</p> <p>Students will:</p> <ul style="list-style-type: none"><li>• Have an interest in becoming an Engine Boss.</li><li>• Have completed the online portion of the course and passed the online assessment.</li><li>• Exhibit mutual cooperation with the group.</li><li>• Actively participate in all of the training exercises presented in the course.</li><li>• Return to class at stated times.</li><li>• Use what is presented in the course to effectively perform the duties of an Engine Boss.</li><li>• Not leave the course with any unanswered questions.</li></ul>	<p>Slide 0-11</p>

## UNIT OVERVIEW

<b>Course</b>	Engine Boss, S-231
<b>Unit</b>	1 – Engine Boss Fundamentals
<b>Time</b>	1.5 Hours

### Objectives

1. Recall content provided in Modules 1-6 of the online course.
2. Apply knowledge and skills to scenario-based questions.

### Strategy

This unit is designed to serve as a review of the content from the online portion of the course. The review is in a game-show-style format and is called “Fire-Away” (instructions for how to play the game are provided below). Students should stay in the same groups they were in for the expectations exercise in the previous unit.

Prior to starting the game, the instructor should review the general responsibilities of the Engine Boss, Single Resource (ENGB), to refresh the students’ memories of the content they learned previously. In the game, there are four categories of questions: situation awareness and fire sizeup, engine/crew capabilities, tactics, and wildland urban interface (WUI). The categories span the topics covered in Modules 1-6 of the online portion of the course. The game will require students to apply their knowledge to a variety of scenarios.

The students who attend this course may have varied backgrounds and experience levels; consequently, the instructors who teach this course must be open to more than one way of performing the tasks of an Engine Boss. It is important to encourage the students to discuss items thoroughly and that differences of opinion are acceptable.

### Instructional Method(s)

- Informal lecture
- Interactive group discussion

## **Instructional Aids**

- Computer with projector, PowerPoint software, and screen (consider a white board to project and draw on)
- Flip charts and markers
- Fireline Handbook
- Incident Response Pocket Guide (IRPG)
- Single Resource Boss Position Task Book
- Wildland Fire Qualification System Guide (PMS 310-1)

## **Exercise(s)**

- Engine Boss Fundamentals

## **Outline**

- I. Review of Online Modules
- II. Engine Boss Fundamentals

## **Aids and Cues Codes**

The codes in the Aids and Cues column are defined as follows:

IG – Instructor Guide	IR – Instructor Reference
SW – Student Workbook	SR – Student Reference
HO – Handout	Slide – PowerPoint

## UNIT PRESENTATION

**Course** Engine Boss, S-231

**Unit** 1 – Engine Boss Fundamentals

OUTLINE	AIDS & CUES
<b>Present title slide.</b> <b>Present unit objectives.</b>	Slide 1-1
	Slide 1-2
I. REVIEW OF ONLINE MODULES	Slide 1-3
<u>Purpose:</u> Instructor will provide an overview of material covered in the online portion of the course.	
<u>Time:</u> 15 minutes	
A. Module 1: Your Role as an Engine Boss  Remind students that as an Engine Boss, they will have additional responsibilities managing their crew and engine. These additional responsibilities will include: performing in the role of decision-maker and leader; understanding and implementing fire suppression tactics; using, managing, and protecting the equipment you have been assigned; and understanding and implementing fire suppression tactics in the WUI.	

OUTLINE	AIDS & CUES
<p>B. Module 2: Engine/Crew Capabilities and Limitations</p> <p>Remind students that this module covered the Engine Boss’s responsibility for knowing about his/her engine and crew’s capabilities and limitations.</p> <p>Remind students that these responsibilities include: maintaining inventory pre-incident, during an incident, and post-incident (including post-incident rehabilitation); performing daily and preventative engine maintenance; and identifying crew readiness based on experience, qualifications, and condition when deciding whether or not to attempt an assignment.</p> <p>C. Module 3: Situation Awareness</p> <p>Remind students that this module addressed sources of information that an Engine Boss will use to complete a tactical assignment. It also reviewed the information an Engine Boss must obtain at the Supervisor Briefing and then what he/she should disseminate to subordinates during the Subordinate Briefing. Remind students of the importance of using their IRPG Briefing Checklist both when gathering and disseminating information. Finally, explain the importance of coordination and communication with other incident personnel.</p>	

OUTLINE	AIDS & CUES
<p>D. Module 4: Sizeup Considerations</p> <p>Remind students of the fire sizeup elements that must be considered en route to an incident, which include: smoke columns, fuels, terrain and topography, fire behavior, current and predicted weather, and smoke columns. Remind them that they should also consider the fire history in an area and their jurisdiction (especially important during communications with dispatch). They should also remember that certain areas or situations (e.g., cultural resources, wilderness areas) may require additional attention and consideration during fire sizeup.</p> <p>Review the things that an Engine Boss should keep in mind when en route to an incident, which include: water sources, roads and vehicle access, and safety. Explain that once on scene at an incident an Engine Boss may be required to make decisions regarding strategy and tactics, constructing the control line, and utilizing additional resources. Emphasize the importance of staying in communication at all times.</p> <p>E. Module 5: Tactics</p> <p>Remind students that this module covered topics such as personnel safety considerations, fuel groups and expected fire behavior, direct/indirect attack advantages/disadvantages, tactics, developing alternative plans based on</p>	

OUTLINE	AIDS & CUES
<p>equipment failures and/or personnel problems, and conducting an After Action Review (AAR).</p> <p>Review the four fuel groups (grass, shrub, timber litter, and logging slash), and remind students that within each fuel group, they should be aware of the fuel's rate of spread, reaction with water and additives, extent of mopup required, duration of heat and flame, most effective engine types, and most effective method of attack.</p> <p>Highlight the four questions that should be asked during an AAR: what was planned, what actually happened, why it happened, and what can be done next time.</p> <p>F. Module 6: Wildland Urban Interface</p> <p>Remind students that this module discussed wildland urban interface (WUI) considerations including structure triage, safety concerns, and crew withdrawal decision-making. This module also reviewed several of the hazardous WUI situations of which an Engine Boss should be especially cognizant.</p> <p>These situations include: poor access and narrow one-way roads; bridge load limits; wooden construction and wood shake roofs, inadequate water supply; natural fuels 30 feet or closer to structures; structures in chimneys, canyons, or on slopes; extreme fire behavior; strong winds; evacuation of</p>	

OUTLINE	AIDS & CUES
<p style="text-align: center;">the public; power lines; petroleum and propane tanks; and outbuildings. These situations are also listed in the IRPG.</p> <p>II. ENGINE BOSS FUNDAMENTALS</p> <p><b>EXERCISE: Engine Boss Fundamentals</b></p> <p><u>Purpose:</u> Students will review and apply the material covered in the online portion of the course.</p> <p><u>Time:</u> 1 hour and 15 minutes</p> <p><u>Format:</u> Students work in small groups of 4 to 5.</p> <p><u>Materials Needed:</u> Flip charts and markers</p> <p><u>Instructions:</u></p> <ol style="list-style-type: none"> <li>1. Divide the students into equal groups and refer them to the exercise on page 1.5 of their Student Workbook. Each question and space for notetaking is provided.</li> <li>2. Explain that the purpose of the game is to help refresh students' memory of Modules 1–6 of the online portion of the course. The questions are also intended to get the students to begin applying these concepts to real-life scenarios.</li> <li>3. Explain that, to play the game, teams will take turns selecting questions from the board. When it is a particular team's turn, a team member will choose the category and point value of the question his/her team wants. Once the team has answered the question, you simply select the Back to the Board button.</li> </ol>	<p>Slide 1-4</p>

OUTLINE	AIDS & CUES
<p>4. Regardless of whether or not a question is answered correctly, each team has only one opportunity to respond. After a team responds, it then becomes the next team's turn.</p> <p>5. Explain that there is one Fire-Away Bonus Question randomly inserted into each category. Teams who choose these questions will get double the listed amount of points if they answer correctly.</p> <p>6. In order to determine which team selects first in the game, you could consider silently choosing a number between 1 and 20 and then having each team attempt to guess that number. The team that guesses correctly or gets closest to your number will then go first.</p> <p>You could also consider a Bonus Round during which each team is asked to put a series of items in order or to answer a question; whichever team correctly answers first would then be allowed to select first in the game.</p> <p>7. Decide beforehand the order in which teams will choose questions (e.g., clockwise/counter-clockwise from whichever team is chosen to go first).</p> <p>8. Note that the game was designed to be flexible to the needs of the instructor and the students. You have the option of going through each question in order or having the students determine the order. You may also determine those questions you want to discuss as a class and those you want each team to respond to individually.</p>	

OUTLINE	AIDS & CUES
<p>9. Possible answers are provided below each question in the Instructor Guide; however, you are encouraged to provide additional solutions where appropriate.</p> <p>10. The student workbook provides space below each question for students to take notes.</p> <p>11. When all of the questions have been selected and you are finished with the game board, click on the slide anywhere outside of the board to move on to the last slide of the unit.</p> <p><b>A. SITUATION AWARENESS AND FIRE SIZEUP 10 – FIRE-AWAY BONUS QUESTION</b></p> <p><b>1. Question</b></p> <p>Fire-Away Bonus Question – The team that chose this question should receive 20 points if it answers correctly.</p> <p>Name and describe the four fuel groups including the most effective engine type and method of attack for each one.</p>	<p>Slide 1-5</p>

**2. Answer and Debrief**

Fuel groups and characteristics include:

- Grass fuel group – Grass fuel is found in most areas, but is more dominant in desert and range areas, and can become prevalent after a prescribed fire in forested areas. Grass fuels have moderate to high rate of spread, moderate fireline intensity, and a short duration of heat and flame. Most effectively attacked with engine Types 3–7 and direct attack.
- Shrub fuel group – Shrub fuel is found throughout most geographical areas, with moderate to high rate of spread and moderate to high fireline intensity. Shrub fuels have a short duration of heat and flame. Most effectively attacked with engine Types 3–7 and direct, mobile attack.

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li> <p>• Timber litter fuel group – Timber litter fuel is most dominant in mountainous topography. They have low to moderate rate of spread and moderate to high fireline intensity. Timber litter fuels have a longer duration of heat and flames than the grass and shrub groups, especially if the litter is deep. Most effectively attacked with engine Types 3–7 and direct, mobile attack OR indirect attack and burnout operations (depending on fireline intensity and terrain).</p> </li> <li> <p>• Logging slash fuel group – Logging slash fuel is the result of debris left after logging, pruning, thinning, or shrub cutting. It may include logs, chunks, bark, branches, stumps, and broken understory trees or shrubs. Logging slash fuels have a lower rate of spread and high to very high fireline intensity. The fuel has a long duration of heat and flame. Most effectively attacked with engine Types 3–7 and both indirect and direct attack.</p> </li> </ul>	

OUTLINE	AIDS & CUES
<p><b>B. SITUATION AWARENESS AND FIRE SIZEUP 20</b></p> <p><b>1. Question</b></p> <p>This type of fuel is most dominant in mountainous topography. It has a low to moderate rate of spread and moderate to high fireline intensity. It also has a longer duration of heat and flames than some other fuel groups, especially if it is deep. What type of fuel is this, and how will it affect your decision-making upon arrival at the incident?</p> <p><b>2. Answer and Debrief</b></p> <p>The type of fuel described is timber litter fuel. Timber litter fuels have a longer duration of heat and flames than the grass and shrub groups, especially if the litter is deep.</p> <p>There is no single correct answer to how this fuel group will affect decision-making upon arrival at the incident. Students should consider the fuel group (in this case timber litter) as well as the size class, fuel moisture, continuity, loading, and fuel temperature in relation to aspect. They should also consider if the fuels</p>	<p>Slide 1-6</p>

OUTLINE	AIDS & CUES
<p>are light and continuous and the live-to-dead ratio. Students should also consider:</p> <ul style="list-style-type: none"> <li>• Engine type</li> <li>• Water capacity</li> <li>• Foam capability</li> <li>• 4x4 vs. 2x4 (access)</li> <li>• Size of fire</li> <li>• Will additional resources be needed to aid in suppression and mopup?</li> <li>• Fuels: large woody fuels or mostly duff?</li> <li>• Snags</li> </ul> <p><b>C. SITUATION AWARENESS AND FIRE SIZEUP 30</b></p> <p><b>1. Question</b></p> <p>On your way to an incident, you carefully monitor the current and predicted weather in relation to the time of year it is, the fuels in the area, where the fire is located, and what resources are already on scene. However, you forget to consider two essential fire sizeup elements. What elements did you forget, and how would they help you understand and respond to the incident to which you have been assigned?</p>	<p>Slide 1-7</p>

**2. Answer and Debrief**

The Engine Boss should have also considered the smoke columns and fire behavior as part of your fire sizeup.

- Smoke columns: Checking the size, height, color, direction, and shape of the smoke column will give you an idea of the fire size and its activity, which will inform how you should go about attacking it.
- Fire behavior: Thinking about the factors that influence fire behavior can also give you insight into how to best direct your crew and resources upon arrival at the incident. You should think about the type of fire, rate of spread, size and location of the fire, and the time of day when determining the fire's potential behavior. You should use Pocket Cards for the local area to assist you in doing so.

OUTLINE	AIDS & CUES
<p><b>D. SITUATION AWARENESS AND FIRE SIZEUP 40</b></p> <p><b>1. Question</b></p> <p>In an effort to gather the information needed to complete your tactical assignment, you talk with your Fireline Supervisor and consult the Incident Action Plan (IAP) to get more information. What other sources should you consult to help you build a complete picture of the situation?</p> <p><b>2. Answer and Debrief</b></p> <p>You can also consider consulting:</p> <ul style="list-style-type: none"> <li>• Task Force or Strike Teams</li> <li>• Individuals in the area who may have local knowledge</li> <li>• Air resources</li> <li>• Other Engine Bosses and crews</li> <li>• Dispatch</li> <li>• General observations and situation awareness</li> </ul> <p>If you do use local knowledge to build your situation awareness, do not accept what you hear at face value; instead, evaluate the integrity of the information source, and verify that the information is accurate, reliable, and current.</p>	<p>Slide 1-8</p>

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<p><b>E. SITUATION AWARENESS AND FIRE SIZEUP 50</b></p> <p><b>1. Question</b></p> <p>During a Subordinate Briefing, you explain to your crew that your team has been called to an incident in a nearby forest. Initial attack forces were not able to contain the fire within the first burn period, and a Type 2 Incident Management Team is transitioning in tomorrow. Your engine has been assigned to this incident and will be responsible for constructing a hose lay on the fire's eastern perimeter. You will be using Tac 2 for communications and will be working with two other engine crews.</p> <p>Using your IRPG Briefing Checklist, review the items on the checklist that you have already covered, and identify what other item(s) needs to be discussed before you can head out to the incident.</p>	<p>Slide 1-9</p>

OUTLINE	AIDS & CUES
<p><b>2. Answer and Debrief</b></p> <p>You have already covered four of the five items on the IRPG Briefing Checklist:</p> <ul style="list-style-type: none"> <li>• <b>Situation:</b> Initial attack forces were not able to contain fires within the first burn period; a Type 2 Incident Management Team is transitioning in tomorrow.</li> <li>• <b>Mission/Execution:</b> Your crew will be responsible for constructing a hose lay on the fire's eastern perimeter.</li> <li>• <b>Communications:</b> You will be using Tac 2 for communications.</li> <li>• <b>Service/Support:</b> You will be working with two other engine crews.</li> </ul> <p>You still need to discuss the final item on the IRPG Briefing Checklist: risk management. Sample responses may include:</p> <ul style="list-style-type: none"> <li>• <b>Known hazards and risks</b></li> <li>• <b>Control measures to eliminate hazards and reduce risk including anchor point and</b></li> </ul>	

OUTLINE	AIDS & CUES
<p style="text-align: center;">Lookouts, Communications, Escape Routes, and Safety Zones (LCES)</p> <ul style="list-style-type: none"> <li>• Trigger points for disengagement/reevaluation of operational plan</li> </ul> <p><b>F. TACTICS 10</b></p> <p><b>1. Question</b></p> <p>A good Engine Boss always has safety at the forefront of his or her mind. List five safety guidelines that can keep you and your crew safe while at an incident.</p> <p><b>2. Answer and Debrief</b></p> <p>Safety guidelines that will keep a crew safe include:</p> <ul style="list-style-type: none"> <li>• Fight fire in fuels consistent with engine capabilities.</li> <li>• Use direct attack when possible.</li> <li>• Situation awareness.</li> <li>• Maintain LCES.</li> <li>• Attack flank with greatest potential for escape.</li> <li>• Burn out unburned fuels.</li> <li>• Use extreme caution during frontal assaults.</li> <li>• Avoid fire path of least resistance.</li> </ul>	<p style="text-align: center;">Slide 1-10</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Recognize topography hazards.</li> <li>• Be aware of environmental factors.</li> </ul> <p><b>G. TACTICS 20</b></p> <p><b>1. Question</b></p> <p>Watch the video of a close call. What factors do you think may have led up to this situation? How could it have been prevented and what would you do as an Engine Boss after this happened?</p> <p><b>2. Answer and Debrief</b></p> <ul style="list-style-type: none"> <li>• What looks like the plan? This question is asked so that everyone’s understanding of the assignment is discussed.</li> <li>• What actually happened? This question is asked to determine what happened from each person’s perspective.</li> <li>• Why did it happen? This question helps the group figure out the cause and effect of what occurred at the incident.</li> <li>• What can be done next time? This question provides learning and allows the group to strategize and learn from the incident.</li> </ul>	<p>Slide 1-11</p>

OUTLINE	AIDS & CUES
<p><b>H. TACTICS 30</b></p> <p><b>1. Question</b></p> <p>You are responding to a fire in light, flashy fuels on relatively flat ground. What is the best method of attack for this kind of fire? Explain your answer.</p> <p><b>2. Answer and Debrief</b></p> <ul style="list-style-type: none"> <li>• Mobile attack – If the terrain is flat, you may be able to drive your engine right to the fire. “One foot in the black.”</li> <li>• Direct attack – Minimal area burned, safest place to work, reduce the possibility of moving fire, and reduce/eliminate uncertainties of burning out.</li> </ul>	<p>Slide 1-12</p>
<p><b>I. TACTICS 40 – FIRE-AWAY BONUS QUESTION</b></p> <p><b>1. Question</b></p> <p>Fire-Away Bonus Question – The team that chose this question should receive 80 points if it answers correctly.</p>	<p>Slide 1-13</p>

OUTLINE	AIDS & CUES
<p>Your engine has been dispatched to an incident. As you arrive on scene and are briefed, you learn that fire behavior has been extreme in the afternoon with temperatures in the high 80s to low 90s and very low relative humidity. You are also told that ingress/egress has been an issue due to narrow roads and bridges en route to the fire.</p> <p>As the Engine Boss, what can you do to prepare given these conditions?</p> <p><b>2. Answer and Debrief</b></p> <p>As Engine Boss, you should:</p> <ul style="list-style-type: none"><li>• Based on your assignment, figure out where to position your engine so that you can quickly leave if needed.</li><li>• Determine if bridges are passable and can bear the weight of your engine. If not, set up a hose lay.</li><li>• Do not travel down any roads that are unsafe; find a different way to approach the fire or use a different tactic (like a hose lay).</li></ul>	

OUTLINE	AIDS & CUES
<p><b>J. TACTICS 50</b></p> <p><b>1. Question</b></p> <p>As you arrive on scene, determine the appropriate tactics to be used in this situation and explain your reasoning.</p> <p><b>2. Answer and Debrief</b></p> <p>In order to support the dozer line on initial attack as an engine, you should do the following:</p> <ul style="list-style-type: none"> <li>• Begin supporting the dozer by following the constructed line cooling hotspots and securing the line.</li> <li>• When the dozer line becomes too rough for your engine to continue, begin a hose lay from an appropriate spot with good access and egress.</li> <li>• Set up a portable pump and portable tank to support the hose lay in order to allow your engine to remain mobile.</li> </ul>	<p>Slide 1-14</p>

OUTLINE	AIDS & CUES
<p><b>K. WILDLAND URBAN INTERFACE 10 – FIRE-AWAY BONUS QUESTION</b></p> <p><b>1. Question</b></p> <p>Fire-Away Bonus Question – The team that chose this question should receive 20 points if it answers correctly.</p> <p>Refer to the image. How would you triage this structure, and why?</p> <p><b>2. Answer and Debrief</b></p> <p>This structure should be triaged as Needing “PROTECTION” but “SAVABLE.” It has a metal roof, well-watered lawn, and the trees have been thinned. There is a defensible space to work from. An Engine Boss should consider directing his/her crew to remove the wood pile near the house, trimming low-hanging branches, checking the building for hazardous materials, and other flammable materials near the structures. Ensure the engine is parked facing out for quick egress. You should also do the following:</p> <ul style="list-style-type: none"> <li>• Allow the fire to continue backing down the hill.</li> <li>• Burnout around the structures and tie into the existing black.</li> <li>• Patrol for spots.</li> </ul>	<p>Slide 1-15</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Set up hose lay around the structures.</li> </ul> <p><b>L. WILDLAND URBAN INTERFACE 20</b></p> <p><b>1. Question</b></p> <p>Refer to the image. In this situation, what hazards do you see and how will they affect your operations?</p> <p><b>2. Answer and Debrief</b></p> <p>Hazards include the following:</p> <ul style="list-style-type: none"> <li>• Structure with natural fuels 30 feet or closer</li> <li>• Structure on a slope</li> <li>• Narrow roads</li> <li>• Wooden construction</li> <li>• Inadequate water supply</li> </ul> <p>Sample responses as to how these hazards would affect operations may include:</p> <ul style="list-style-type: none"> <li>• Little to no defensible space around the structure or area to establish a safety zone, making structure defense efforts both difficult and dangerous. Make sure engines/vehicles are pre-positioned downhill or facing out of the driveway for easy egress.</li> </ul>	<p>Slide 1-16</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• On steep slopes, fire may spread at an accelerated rate, spot fires may outflank the main fire, and/or burning materials can roll downhill.</li> <li>• Narrow roads may make ingress and egress difficult for engines.</li> <li>• Wooden construction may make the structure an easy target for firebrands/burning fuel and/or may be preheated by radiant heat until reach combustion temperatures. Watch out for dangerous structure fire conditions.</li> <li>• An inadequate water supply may require you to use alternate water sources (e.g., a nearby stream, water tender).</li> </ul>	
<p><b>M. WILDLAND URBAN INTERFACE 30</b></p>	Slide 1-17
<p><b>1. Question</b></p> <p>You and your crew arrive on scene at an incident located near the neighboring town. Several structures are threatened by the approaching fire. During triage, what should you</p>	

OUTLINE	AIDS & CUES
<p>as an Engine Boss keep in mind regarding each of the following categories?</p> <ul style="list-style-type: none"><li>• Firefighter Safety</li><li>• Structure</li><li>• Surrounding Fuels</li><li>• Fire Behavior</li><li>• Alternate Water Sources</li></ul> <p><b>2. Answer and Debrief</b></p> <p>Answers may vary and do not need to include all the information listed below. An Engine Boss should generally keep in mind the following factors about each category:</p> <ul style="list-style-type: none"><li>• Firefighter Safety: Safety of firefighters and the public always comes first.</li><li>• Structure: Think about the type of structure, exterior walls, windows, proximity of above-ground fuel tanks, flammability of roof and siding, eaves/building openings, decks, awnings, structure location, position on the slope.</li></ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Surrounding Fuels: Consider trees, shrubs, and flammable materials adjacent to the structure. Also watch out for decks with brush and/or skirting underneath, as well as low-hanging branches. Finally, think about fuel proximity to structure and predicted flame length.</li> <li>• Fire Behavior: Pay attention to fire intensity – the greater the intensity, the wider the defensible space needed around the structure. Pay attention to spotting, flame length, fire whirls, etc.</li> <li>• Alternate Water Sources: You may consider using hydrants/standpipes, storage tanks, pool/hot tubs, ponds, irrigation ditches, sprinkler systems, and/or stock tanks. Be sure to get agency permission before using any of the alternate water sources listed above.</li> </ul>	

OUTLINE	AIDS & CUES
<p><b>N. WILDLAND URBAN INTERFACE 40</b></p> <p><b>1. Question</b></p> <p>Your engine and crew are supporting a neighboring district's structure defense efforts. Several of the structures have been overtaken by the approaching fire, and those that remain may need to be abandoned. As an Engine Boss, you are tasked with deciding whether or not it is time for your crew to withdraw.</p> <p>Identify three conditions that would indicate that your attempts to save the remaining structures may be unsuccessful and/or too dangerous.</p> <p><b>2. Answer and Debrief</b></p> <p>You and your crew's attempts to save the remaining structures may be unsuccessful and/or too dangerous if:</p> <ul style="list-style-type: none"> <li>• Escape route becomes unusable</li> <li>• Fire is making significant runs</li> <li>• Structure is within one or two flame lengths of fuels</li> <li>• Numerous spot fires are igniting</li> <li>• Water supply is running low</li> <li>• Roof is more than one-quarter involved and other structures are threatened/involved</li> <li>• Interior rooms are involved</li> </ul>	<p>Slide 1-18</p>

OUTLINE	AIDS & CUES
<p>Remind students that they can consult their IRPG and/or Fireline Handbook for more information. Additionally, although most wildland firefighting agencies are involved in preventing a fire's spread to structures and defending them from the outside only, note that it may be beneficial to refer to your particular agency's responsibility for structure protection.</p> <p><b>O. WILDLAND URBAN INTERFACE 50</b></p> <p><b>1. Question</b></p> <p>Lightning associated with a thunderstorm ignites several wildfires in a neighboring town. Your engine module, consisting of two Type 3 wildland engines, responds to the call from District Dispatch. Dispatch alerts you to the fact that the winds have picked up to 25 mph with gusts to 40 and that several structures located on the heavily wooded hillside are now threatened. You will also be coordinating with local law enforcement to evacuate the residents of the threatened homes.</p> <p>Identify the WUI hazards you will encounter in this situation and what you should keep in mind about each one.</p>	<p>Slide 1-19</p>

OUTLINE	AIDS & CUES
<p><b>2. Answer and Debrief</b></p> <p>Sample responses may include:</p> <ul style="list-style-type: none"><li>• Structures with natural fuels 30 feet or closer: You may not be able to establish a safety zone or create a defensible space.</li><li>• Structures on a steep slope: Watch for accelerated spread rate, spot fires, and burning materials (which can roll downhill).</li><li>• Extreme fire behavior: Watch out for blocked egress, potential for the fire to outflank you, limited effectiveness of air resources, and abnormal fire behavior for the time of day.</li><li>• Strong winds: Be aware of the fact that strong winds may cause an increased rate of spread, closer flame angle to fuel, increased oxygen supplied to the fire, minimal backing spread rates, and multi-head and fingered fires.</li><li>• Evacuation of the public: You will need to brief law enforcement personnel and place a firefighter with them; also ensure that they are kept</li></ul>	

OUTLINE	AIDS & CUES
<p>out of extreme fire situations. If this is a large-fire scenario, a contingency plan would have been developed, and you may be responsible for holding public briefings about the fire situation. In general, don't let the situation turn into a fear flight – help the public to evacuate in an orderly and safe manner.</p> <p><b>P. ENGINE/CREW CAPABILITIES 10</b></p> <p><b>1. Question</b></p> <p>A good Engine Boss always keeps his or her engine in a state of full readiness. When should you inventory your engine to make sure it is ready to respond to an incident? What is important about the inventory at that time?</p> <p><b>2. Answer and Debrief</b></p> <p><b>Pre-Incident:</b> You should have a systematic method for maintaining pre-incident inventory. The Red Book contains the inventory standards for most Federal agencies.</p> <p><b>During Incident:</b> You should maintain inventory during an incident by replenishing supplies, repairing or replacing lost or damaged items, and reporting restocking difficulties to your immediate supervisor.</p>	<p>Slide 1-20</p>

**Post-Incident:** When the incident is complete, you should resupply your engine using a pre-incident inventory checklist. If you are unable to replenish at the incident, procure the appropriate documentation to replenish at your home unit. You should leave the incident ready for reassignment; you never know when you could be deployed to another incident.

**Q. ENGINE/CREW CAPABILITIES 20**

Slide 1-21

**1. Question**

Crew qualifications and experience directly impact the types of assignments you can successfully handle. What impact on your capabilities does each of the following have:

- Firing Boss qualification
- Experience with large fires (extended attack)
- Faller qualification
- Emergency Medical Technician (EMT) qualification

OUTLINE	AIDS & CUES
<p><b>2. Answer and Debrief</b></p> <p>Firing Boss qualification means that your crewmembers:</p> <ul style="list-style-type: none"> <li>• Have experience responding to burnout and backfire operations.</li> </ul> <p>Experience with large fires (extended attack) means that your crewmembers:</p> <ul style="list-style-type: none"> <li>• Have experience with large fire assignments during which you have responded as part of a strike team of engines.</li> <li>• Have experience working within an Incident Management Team environment (i.e., Divisions, Branches).</li> <li>• Know how to find support services at Incident Command Post (ICP) (e.g., Ground Support, Supply).</li> <li>• Understand the Incident Action Plan (IAP).</li> </ul> <p>Faller qualification means that your crewmembers have experience with:</p> <ul style="list-style-type: none"> <li>• Line construction assignments involving brushing, bucking, small tree felling.</li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Serving on a felling team as a swamper.</li> <li>• Adhering to agency policies and guidelines.</li> </ul> <p>EMT qualification means that your crewmembers have experience with:</p> <ul style="list-style-type: none"> <li>• Medevac operations.</li> <li>• First aid application to line personnel with minor injuries.</li> <li>• Adhering to agency, state, and Federal policies and guidelines and remaining within scope of responsibilities.</li> </ul>	
<p><b>R. ENGINE/CREW CAPABILITIES 30</b></p> <p><b>1. Question</b></p> <p>You should always be aware of your engine capabilities in order to keep you and your crew safe. What factors impact your engine capabilities?</p> <p><b>2. Answer and Debrief</b></p> <p>You should always think about:</p> <ul style="list-style-type: none"> <li>• Terrain considerations</li> <li>• Water capabilities</li> <li>• Maneuverability</li> <li>• Stationary vs. mobile attack</li> <li>• Heavy smoke (could cause engine/pump failure)</li> </ul>	<p>Slide 1-22</p>

OUTLINE	AIDS & CUES
<p><b>S. ENGINE/CREW CAPABILITIES 40 – FIRE-AWAY BONUS QUESTION</b></p> <p><b>1. Question</b></p> <p>Fire-Away Bonus Question – The team that chose this question should receive 80 points if it answers correctly.</p> <p>In what ways might you be limited in your engine capabilities if you were dispatched to an incident and encountered this situation?</p> <p><b>2. Answer and Debrief</b></p> <ul style="list-style-type: none"> <li>• Slope</li> <li>• Terrain is too rocky</li> <li>• Ingress/Egress</li> <li>• Narrow, windy road</li> </ul>	<p>Slide 1-23</p>
<p><b>T. ENGINE/CREW CAPABILITIES 50</b></p> <p><b>1. Question</b></p> <p>Your Type 4 engine is responding to a fire in late August. Extreme fire behavior has been predicted with above-average temperatures and dry thunderstorms conditions expected. The fire is approximately 40 acres, burning midslope in grass and scattered pine trees. It is moving up the slope, pushed by winds. A small group of homes is located about 1/2 mile above the fire on a ridgetop. You are assigned to set up for</p>	<p>Slide 1-24</p>

structure protection. What capabilities and limitations should you consider when accepting this assignment? Under what circumstances can you safely complete this assignment?

## 2. Answer and Debrief

Considerations may include the following:

- Other resources currently available
- Engine's foam capabilities
- Engine's water capabilities
- Crew's level of experience with WUI situations
- Agency policy and guidelines for structure protection
- Lightning safety
- Triage
- Access/egress

**End of Exercise.**

**Review unit objectives.**

Slide 1-25

## UNIT OVERVIEW

**Course** Engine Boss, S-231

**Unit** 2 – Tactical Decisions

**Time** 4.5 Hours

### Objectives

1. Exercise decision-making skills in a tactical context.
2. Practice communicating decisions.

### Strategy

This unit includes two tactical decision exercises that will allow students to practice their decision-making skills in an applied context.

The Tactical Fuel Group Exercise provides students with the opportunity to practice decision-making skills in four different tactical contexts. Given a scenario, the students will act as Engine Bosses to decide the best method of attack; placement of resources; and the advantages, disadvantages, safety concerns, and considerations of the given situations.

The Tactical Scenario Exercise provides students with the opportunity to practice decision-making skills on a large incident as it progresses and fire behavior/conditions change at different times of day. Students will be asked to issue a Subordinate Briefing based on a Supervisor Briefing delivered by a facilitator. Subordinates will be asked to deliver feedback and ask questions following the briefing. Once a solution has been agreed upon, students will participate in an After Action Review (AAR) and may be asked to present the content of their AAR to the class. This exercise can be facilitated with a sand table or map using Google Earth, as deemed appropriate by the instructor.

Note that the students who attend this course may have varied backgrounds and experience levels; consequently, the instructors who teach this course must be open to more than one way for performing the tasks of an Engine Boss. It is important to encourage the students to discuss items thoroughly and that differences of opinion are acceptable.

### Instructional Method(s)

- Interactive group discussion
- Exercises

## **Instructional Aids**

- Computer with projector, presentation software, and screen
- Flip charts and markers
- Fireline Handbook
- Incident Response Pocket Guide (IRPG)
- Maps for each of the four scenarios in the Tactical Fuel Group Exercise
- Maps and support documents for the Tactical Scenario Exercise
- Sand table exercise props and accessories
- Google Earth map retrieval for Yellow Pine area, Idaho

## **Exercise(s)**

- Tactical Fuel Group Exercise (Scenarios #1–4 and accompanying maps; see IR 2-1)
- Tactical Scenario Exercise (see IR 2-2)

## **Outline**

- I. Tactical Fuel Group Exercise
- II. Tactical Scenario Exercise

## **Aids and Cues Codes**

The codes in the Aids and Cues column are defined as follows:

IG – Instructor Guide	IR – Instructor Reference
SW – Student Workbook	SR – Student Reference
HO – Handout	Slide – PowerPoint

## UNIT PRESENTATION

**Course** Engine Boss, S-231

**Unit** 2 – Tactical Decisions

OUTLINE	AIDS & CUES
<p><b>Present title slide.</b></p> <p><b>Present unit objectives.</b></p>	<p>Slide 2-1</p> <p>Slide 2-2</p>
<p>I. TACTICAL FUEL GROUP EXERCISE</p> <p><b>EXERCISE: Tactical Fuel Group Exercise</b></p> <p><u>Purpose:</u> Determine the best method of attack, placement of resources, and advantages, disadvantages, safety concerns, and considerations given a specific fuel group-related scenario.</p> <p><u>Time:</u> 1 hour</p> <p><u>Format:</u> Small groups</p> <p><u>Materials Needed:</u> Scenarios and maps for each scenario</p> <p><u>Instructions:</u></p> <p><b>Prior to Exercise</b></p> <ol style="list-style-type: none"><li>1. Divide the students into equal groups and refer them to the Tactical Fuel Group Exercise on page 2.3 of their Student Workbook.</li></ol>	<p>Slide 2-3</p> <p>IR 2-1</p>

OUTLINE	AIDS & CUES
<ol style="list-style-type: none"> <li>2. Have separate areas for student groups with sufficient space so that individual groups cannot hear the adjacent group.</li> <li>3. Assign cadre members or subject matter experts to facilitate this exercise. A facilitator is needed at each station to implement the scenario.</li> <li>4. Each station should have a map with fire perimeter that corresponds with the scenario assigned.</li> <li>5. Review given scenarios and answer the accompanying questions.</li> <li>6. Ensure students have an IRPG.</li> <li>7. Introduce students to exercise objectives and format.</li> <li>8. Define “rules” of the exercise: <ul style="list-style-type: none"> <li>• Complete one scenario at a time (e.g., all groups will be working on Scenario #1; then all groups will move on to Scenario #2) and continue until all the scenarios have been presented and discussed.</li> <li>• Each group is to provide a solution for each scenario based on the following: <ul style="list-style-type: none"> <li>– Best method of attack</li> <li>– Placement of resources</li> <li>– Advantages, disadvantages, safety concerns, and considerations</li> </ul> </li> </ul> </li> </ol>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• 15-minute time limit per exercise: Allow student groups 5–10 minutes to complete each scenario. Then ask one or two groups to present their solution. Have each group pick a spokesperson and present his/her group’s solution to the class.</li> <li>• Facilitate a discussion among all groups based on group presentations. There are no “textbook” answers. Student solutions may differ. Students need only to justify reason for the tactics and strategy they used.</li> <li>• The scenario maps should be displayed on the screen with the electronic presentation.</li> <li>• If this exercise is to be conducted as a sand table exercise, refer to Tactical Decision Games Workbook (located online at <a href="http://www.fireleadership.gov/toolbox/toolbox.html">www.fireleadership.gov/toolbox/toolbox.html</a>). Under the title “Make Sound Decisions” are links to instructions on implementing the tactical decision games using sand tables.</li> </ul> <p><b>During Exercise</b></p> <ol style="list-style-type: none"> <li>1. After dividing the class into groups and assigning each group to a specific area, begin with Scenario #1.</li> <li>2. After 5–10 minutes have passed, choose one or two groups to present. Allow for limited (e.g., 5–10 minute) discussion about what is presented.</li> <li>3. Move on to Scenario #2, and repeat the steps above. Then repeat these steps for Scenarios #3 and 4.</li> </ol>	<p>Slide 2-4 to Slide 2-8</p>

OUTLINE	AIDS & CUES
<p><b>Post Exercise</b></p> <ol style="list-style-type: none"> <li>1. Review the intent of the exercise: <ul style="list-style-type: none"> <li>• Exercise decision-making skills in a tactical context.</li> <li>• Practice communicating decisions.</li> </ul> </li> <li>2. Reinforce lessons learned by offering an historical account of similar scenarios.</li> <li>3. Encourage evaluation of your performance as facilitator.</li> <li>4. Encourage continued debate and replay.</li> </ol> <p><b><u>End of Exercise.</u></b></p> <p>II. TACTICAL SCENARIO EXERCISE</p> <p><b>EXERCISE: Tactical Scenario Exercise</b></p> <p><u>Purpose:</u> Obtain essential information from the Incident Commander and brief crewmembers and adjoining forces, maintain LCES and standard safety procedures, and participate in an After Action Review.</p> <p><u>Time:</u> 3.5 hours</p> <p><u>Format:</u> Small groups</p> <p><u>Materials Needed:</u> Scenarios and scenario updates:</p> <ul style="list-style-type: none"> <li>• Riordan Fire Area Instructor Map</li> <li>• Riordan Fire Area Student Map</li> </ul>	<p>Slide 2-9 IR 2-2</p>

Instructor Tip:

The scenario is part of the Cascade Complex Fire; however, this should NOT be shared with students until the end of the exercise. Allow students to work through and make decisions about the scenario updates at each timeframe. Encourage them to mark up their Students Maps with your input.

Use this exercise as an opportunity for students to ask and discuss what you (the instructor) would do as an Engine Boss if you were in each situation. There are generally no right answers up until the final scenario update (Time 1630). At this point, students should decide whether or not they want to pull out as the Incident Commander (IC) directs. Once decisions have been made, advance to the Riordan Fire Perimeter Map (Slide 2-12) and then the Cascade Complex Map (Slide 2-13) In this way, students can see what the effects of their decisions would have been had they made the same decision during the actual incident. Discuss students' actions and how they would have been affected by the incident outcome.

Instructions:**Prior to Exercise**

1. Divide the students into equal groups and refer them to the Tactical Scenario Exercise on page 2.5 of their Student Workbook.
2. The Riordan Fire Area Student Map is available in the Student Workbook. Give students copies (in color, if possible) of this map as handouts.

OUTLINE	AIDS & CUES
<ol style="list-style-type: none"> <li>3. Have separate areas so that the student groups cannot hear the adjacent group.</li> <li>4. Assign cadre members or subject matter experts to facilitate this exercise. A facilitator is needed at each station to implement the scenario.</li> <li>5. If this exercise is to be conducted as a sand table exercise, refer to Tactical Decision Games Workbook located online at <a href="http://www.fireleadership.gov/toolbox/toolbox.html">www.fireleadership.gov/toolbox/toolbox.html</a>. Under the title “Make Sound Decisions” are links to instructions on implementing the tactical decision games using sand tables.</li> </ol>	
<p><b>During Exercise</b></p>	
<ol style="list-style-type: none"> <li>1. Introduce the scenarios. Avoid reading, issue a briefing. Maintain eye contact with students.</li> </ol>	
<ol style="list-style-type: none"> <li>2. Anticipate and answer reasonable additional questions, but do not prolong scenario briefing.</li> </ol>	
<ol style="list-style-type: none"> <li>3. The Riordan Fire Area Instructor Map (Slide 2-10) shows the larger Riordan Fire Area including access and egress roads. Project the slide onto a whiteboard, and use colored pens to mark resources, fire boundaries, and other features/points that come up in your discussion (this applies whether you are using a virtual sand table or an actual sand table).</li> </ol>	<p>Slide 2-10</p>
<p>Students can work on the Riordan Fire Area Student Map (Slide 2-11), which is a more detailed version of the Riordan Fire Area, and is included in their Student Workbook.</p>	<p>Slide 2-11</p>

OUTLINE	AIDS & CUES
<p>4. If you have an Internet connection, navigate to Google Earth (<a href="http://earth.google.com">http://earth.google.com</a>), and explore the area either from an aerial or ground view. Note that if you use the ground view, it may be beneficial to navigate as if you were driving up the Johnson Creek Drainage north toward Yellow Pine.</p> <p>Do not advance beyond Slide 2-11 until the conclusion of the exercise – students should not be told that the scenario is a real-life incident, nor should they know its outcome (which is revealed on Slides 2-12 and 2-13) until the end.</p> <p>5. Instruct students to use their Riordan Fire Area Student Map (SR 2-2) to assist them in identifying resources and changes in resources for each scenario.</p> <p>6. Signal start of time limit.</p> <p>7. Are you still answering questions or “coaching”? Stop it!</p> <p>8. Signal when time is up.</p> <p>9. Select a student to provide a solution; do not rely on volunteers.</p> <p>10. Direct selected student to issue decision as instructions to other students assigned to “subordinate roles.”</p> <p>11. Is the decision being delivered as instructions? No theoretical “would have,” “should have,” or “could have” discussions allowed!</p>	

OUTLINE	AIDS & CUES
<p>12. After instructions have been issued, check role-playing subordinates' feedback to ensure instructions were understood.</p> <p>13. Select students for additional solutions, repeating the process.</p> <p>14. Consider adding in "Murphy's Law" suggestions as you go through each scenario update. The Murphy's Law suggestions listed below can be added as "What ifs" at any time during the scenario to raise the stress level of the leader. You can also use one of your own:</p> <ul style="list-style-type: none"> <li>• An engine breaks down.</li> <li>• Time of day is later in the burning period.</li> <li>• A new fire start is discovered nearby.</li> <li>• Wind shifts or increases.</li> <li>• Two of the engine crews are very inexperienced.</li> <li>• The Hotshot Superintendent is adamant about burning out the road immediately.</li> </ul> <p>Here are sample responses to each of the above Murphy's Law suggestions:</p> <ul style="list-style-type: none"> <li>• Direct, running attack on the flanks, ensuring a positive anchor point.</li> <li>• Safety zone in the black.</li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• May be values at risk and a need for change in tactics.</li> <li>• Determine if the attack method is viable depending on terrain and accessibility with the engine.</li> </ul> <p><b>After Action Review</b></p> <ol style="list-style-type: none"> <li>1. Inform students that the scenario they were working from was an actual incident that occurred several years ago. Display the Riordan Fire Perimeter Map to show what actually occurred after the IC issued the order to pull out (which occurs at Time 1630 in the exercise). Then, display the Cascade Complex Fire Map to show the Riordan Fire in relation to the full incident.</li> <li>2. Conduct an After Action Review (AAR) in individual groups based on students' knowledge of the ultimate outcome of the incident. Have the students select a spokesperson to present their findings. Have each group present their findings to the class.</li> <li>3. Use the AAR format found in the IRPG to facilitate the AAR. There are four basic questions in the AAR. <ul style="list-style-type: none"> <li>• What was planned?</li> <li>• What actually happened?</li> <li>• Why did it happen?</li> <li>• What can we do next time?</li> </ul> </li> </ol> <p>Remember, Tactical Decision Games shouldn't have a single solution. Keep the focus of the AAR on what was done and why.</p>	<p>Slide 2-12 Slide 2-13</p>

**Post Exercise**

1. Review the intent of the exercise:
  - Obtain essential information from the IC and brief crewmembers and adjoining forces.
  - Maintain LCES and standard safety procedures.
  - Participate in an AAR.
2. Reinforce lessons learned by offering an historical account of similar scenarios.
3. Encourage evaluation of your performance as facilitator.
4. Encourage continued debate and replay.

**End of Exercise.**

<p><b>Review unit objectives.</b></p>	Slide 2-14
<p><b>Prepare for the final assessment.</b></p>	Slide 2-15
<p><b>FINAL ASSESSMENT INSTRUCTOR TIP:</b> The answers for fill-in-the-blank questions in the final assessment answer key are the most common answers but not necessarily the only correct answers. Students may provide other answers not listed in the answer key. In this case, you may, at your discretion, decide to start a discussion, allowing students to “defend” their answers. Such a discussion may help engage the entire class and reinforce the content of the course.</p>	