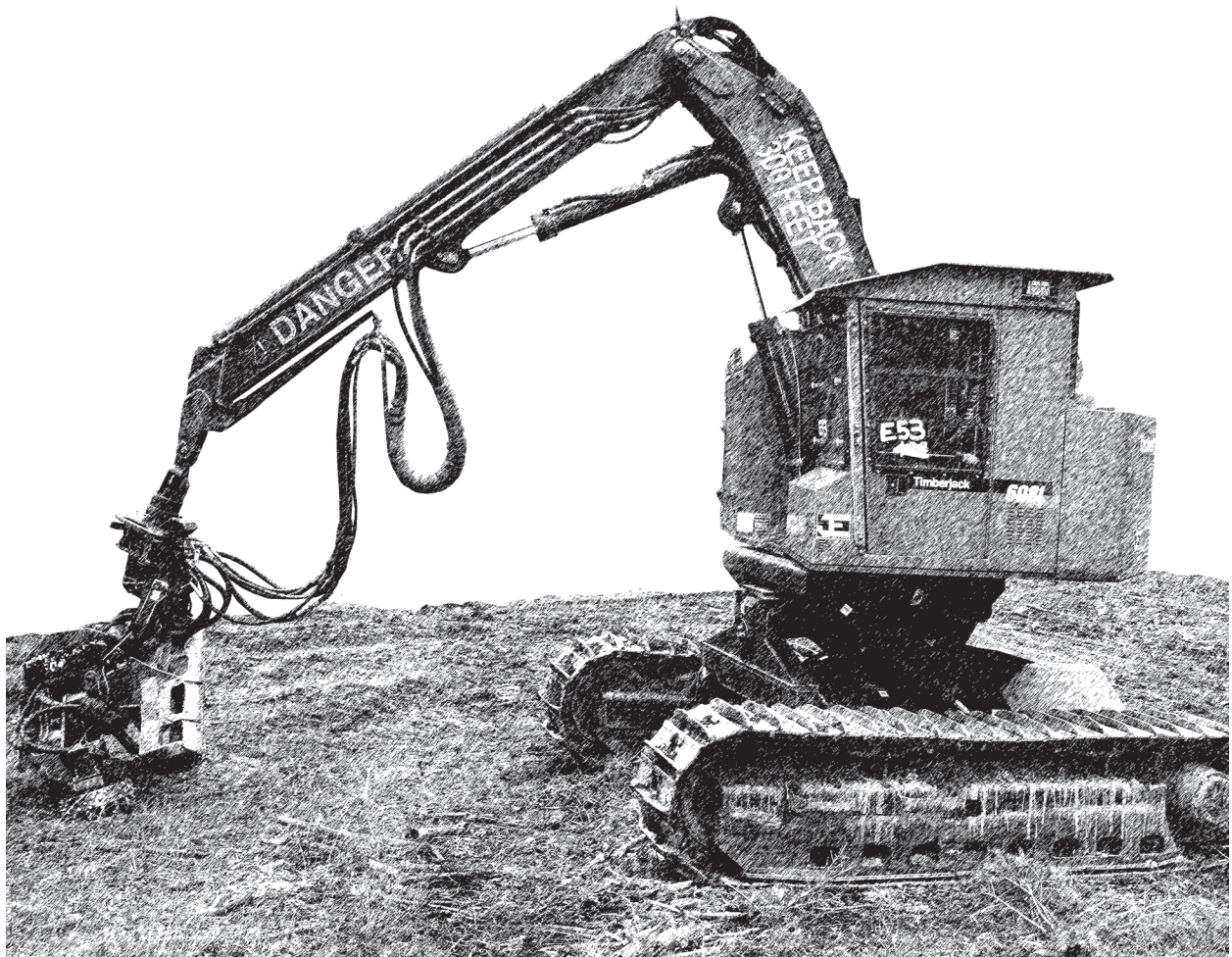


# Heavy Equipment Boss S-236



NFES 002688

**Instructor Guide**  
**June 2013**





## 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:*

Heavy Equipment Boss, S-236  
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.

  
\_\_\_\_\_  
NWCG Executive Board Chair

  
\_\_\_\_\_  
NWCG Training Branch Manager

Date June 19, 2013

Date June 18, 2013



# Heavy Equipment Boss

## S-236

Instructor Guide  
JUNE 2013  
NFES 002688

Sponsored for National Wildfire Coordinating Group (NWCG) publication by the NWCG Operations and Workforce Development Committee. Comments regarding the content of this publication should be directed to National Interagency Fire Center, NWCG Training Branch at [BLM\\_FA\\_NWCG\\_Training@blm.gov](mailto:BLM_FA_NWCG_Training@blm.gov).

For additional copies of this publication, please refer to the annual *NFES Catalog Part 2: Publications* posted on the NWCG Web site at <http://www.nwcg.gov>.

Previous editions: this product replaces S-232, Dozer Boss (March 2006) and S-233, Tractor Plow Boss (August 2005)

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## **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 at the location where the student will likely 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, to ensure the accurate testing of course and unit objectives, test questions in the certified course materials should not be deleted.
- Test grades, used to determine successful completion of the course, shall be based only on the questions presented in the certified course materials.

If lead instructors feel that any course materials are inaccurate, information should be submitted either by accessing the online feedback form at <http://training.nwcg.gov> (select the “NWCG EVAL” button in the upper right corner) or by sending an email to the NWCG Training Branch at [BLM\\_FA\\_NWCG\\_training@blm.gov](mailto:BLM_FA_NWCG_training@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).

- Recommended unit times represent the allotted time to teach the unit and complete the exercises, simulations, and tests.
- Recommended course hours are provided to help the students and the course coordinator plan for travel, room reservations, and facilities usage. The recommended course hours represent the time estimated to present the NWCG-provided materials including time for breaks, lunch periods, to set up for field exercises or simulations, etc.
- Actual times for both the unit(s) 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

*Heavy Equipment Boss, S-236* is a *recommended* 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:

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### NWCG TRAINING BRANCH

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



## CONTENTS

PREFACE .....	i
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### COURSE INSTRUCTIONS

Introduction .....	1
Course Objectives .....	2
Minimum Instructor Qualifications.....	2
Instructor Preparation and Course Coordination .....	2
Course Materials .....	4
Student Target Group .....	7
Course Prerequisites .....	7
Course Nomination and Selection Letters .....	7
Cadre Meetings .....	8
Recommended Class Size .....	8
Space and Classroom Requirements .....	8
Student Assessment and Certification.....	10
Sample Nomination Letter .....	11
Sample Course Selection Letter .....	13
Sample Agenda .....	15

### INSTRUCTIONAL UNITS

Unit 0 – Introduction .....	0.1
Unit 1 – Administration.....	1.1
Unit 2 – Equipment Identification.....	2.1
Unit 3A – Equipment Inspection.....	3A.1
Unit 3B – Optional Field Exercise .....	3B.1
Unit 4 – Briefings and Tactics .....	4.1
Unit 5 – Safety.....	5.1
Unit 6 – All Hazard Assignments .....	6.1

The following appendixes are located on the Course Materials USB Flash Drive:

Appendix A – Course Ordering and Support Information

Appendix B – PowerPoint Presentations

Appendix C – Student Assessment and Answer Key

Appendix D – Course Evaluation Forms

## **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 before presentation.**

### **I. INTRODUCTION**

The S-236, Heavy Equipment Boss (HEQB), course requires 20 hours for presentation. This course is designed to meet the training needs of a HEQB on an incident as outlined in the Interagency Incident Management System: Wildland Fire Qualification System Guide (PMS 310-1) and the position task book developed for the position.

The National Interagency Incident Management System Wildland Fire Qualification System Guide (PMS 310-1), developed under the sponsorship of the National Wildfire Coordinating Group (NWCG), is designed to establish minimum requirements for training, experience, physical fitness level, and currency standards for wildland fire positions, which all participating agencies have agreed to meet for national mobilization.

To ensure that the most up-to-date material is being presented, instructors are encouraged to refer to the NWCG Training and Qualifications website. This website contains current updates for all NWCG courses (go to <http://training.nwcg.gov/>).

## II. COURSE OBJECTIVES

Course objectives are stated in broad terms that define what students will be able to accomplish after completing the course.

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

- Identify the administrative duties and procedures required of a HEQB.
- Identify and demonstrate the heavy equipment inspection process and related duties of the HEQB.
- Demonstrate the actions required of a heavy equipment boss to safely and effectively complete an assignment.
- Discuss relevant information and methods for communication and tactics related to heavy equipment.
- Identify the process of preparing for an all hazard assignment.

## III. MINIMUM INSTRUCTOR QUALIFICATIONS

Refer to the Field Manager's Course Guide (PMS 901-1) for instructor prerequisites specific to this course (online at <http://training.nwcg.gov/>).

## IV. INSTRUCTOR PREPARATION AND 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://training.nwcg.gov/>).

## B. Exercises and Other Pertinent Information

There are Exercises included in Units 1, 4 and 5. If possible it would be better to utilize the actual forms in their original booklets etc. This allows the student to see the original forms and more easily recognize them when dispatched. Otherwise it is up to the instructor to download the necessary forms beforehand. The exercises in Units 4 and 5 are about tactical decision making and safety. Unit 4 and 5 exercises have all the materials necessary already included in either the student workbook or course USB Flash Drive. Unit 4 is a 5 hour unit, it's suggested that 2 instructors are utilized and that it be broken- up before and after lunch on the agenda.

A modified form will be utilized during the Field Exercise inspection portion of the class. The *Daily field inspection checklist form* has been modified and is the current form located in Unit 3B. This form does not need to be copied as it is in the student workbook.

There is also a pre-work online module located at <http://training.nwcg.gov/pre-courses/s236/s236.html>. This should be given to the students at least 6 weeks prior to the instructor lead training (ILT) and should be reviewed the 1<sup>st</sup> day of class to ensure student comprehension.

Also provided in the pre-work is a link to the Yellow-book which will provide the students a preview of the heavy equipment the course will be emphasizing. This Yellow-book is also a great tool for the students to download for their own use/kit material.

## C. Course Agenda

A sample agenda is on page 15. Revise the agenda as appropriate. The agenda can be inserted into the Student Workbook before the beginning of class. Consider removing timeframes from the agenda that is given to the students.

## V. COURSE MATERIALS

The Course Materials USB Flash Drive contains the Instructor Guide, Student Workbook, and Appendixes in bookmarked files in portable document format (PDF).

### A. Instructor Guide

The Instructor Guide is designed as a teaching aid to assist instructors in presenting the course.

Each unit begins with a Unit Overview that outlines the lesson's approximate delivery time, objectives, learning strategy, instructional methods, required materials (instructional aids), and evaluation criteria.

The Unit Presentation follows the Unit Overview, and contains the lesson plan for each unit, shown in a two-column format:

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



## B. Appendixes

The following appendixes are on the Course Materials USB Flash Drive:

- Appendix A – Course Ordering and Support Information

This appendix tells you how to order required components of the course and what additional support materials are needed for course presentation.

- Appendix B – PowerPoint Presentations

Test the equipment before the start of class to ensure compatibility with software.

Refer to the READ ME file, located on the USB Flash Drive, which provides information on:

- Minimum System Requirements to Successfully Run Microsoft PowerPoint 2010 Presentations
- Editing the original PowerPoint 2010 Files
- Troubleshooting
- Microsoft PowerPoint Viewer 2010
- References on Creating PowerPoint Slides

- Appendix C – Student Assessment and Answer Key

This appendix contains the Final Examination and Answer Key. Duplicate enough copies of the final examination for every student to have one copy.

- Appendix D – Course Evaluation Forms

The Student Training Course Evaluation Form allows the students an opportunity 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.

The Training Course Evaluation Form 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.

The Online Course Evaluation Form also allows for feedback. Comments can also be submitted online at <http://training.nwcg.gov> by selecting the NWCG EVAL button in the upper right corner.

## C. Student Workbook

In most cases, the Student Workbook contains the same course information as the Instructor Guide but without the instructor notes, aids and cues, and exercise answers. Student Workbooks should be ordered before the beginning of the course, one for each student.

## VI. STUDENT TARGET GROUP

The target group should consist of individuals qualified as Fire Fighter Type 1, FFT1 desiring to become qualified Heavy Equipment Boss, HEQB.

It is recommended that students have completed

- Basic ICS (I-200)
- Annual Fireline Safety Refresher (RT-130)
- Crew Boss (Single Resource) (S-230)
- Intermediate Wildland Fire Behavior (S-290)

## VII. COURSE PREREQUISITES

Students must have successfully completed S-131, Fire Fighter Type 1. Refer to the Field Manager's Course Guide (PMS 901-1) for current course prerequisites.

## VIII. COURSE NOMINATION AND SELECTION LETTERS

### A. Nomination Letter

Send a course nomination letter, along with the pre-course work information, to students at least 6 weeks before the course begins. The letter should instruct nominees to return the completed pre-course work materials to the course coordinator or lead instructor at least 2 weeks before beginning the course. An example course nomination letter is located on page 11.

### B. Selection Letter

Send a course selection letter to students who successfully complete or pass the pre-course work or are selected to attend the course. This letter congratulates selected students and should explain class times, dates, and location. Refer to the Course Coordinator's Guide (PMS 907) for more information on selection letters. An example course selection letter is located on page 13.

## IX. 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. A cadre meeting checklist is located in the Course Coordinator's Guide (PMS 907).

A cadre meeting before each day's course presentation is recommended because of the interrelationship of the unit material (changing instructional materials in one unit may impact a later unit).

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.

## X. RECOMMENDED CLASS SIZE

The recommended class size is 25 to 30 students. The recommended student-to-instructor ratio is 5:1. Cadre members should be present for all instructional sessions. A minimum of three instructors should present this course; however, more instructors are required if a field exercise is incorporated. This is to enable strong mentorship by the cadre to the students.

## XI. SPACE AND CLASSROOM REQUIREMENTS

The characteristics of the classroom and supportive facilities have a significant impact on the learning environment. The classroom should be chosen and viewed well in advance of the presentation.

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

- A facility which is able to logistically coordinate the "recommend" field day portion of the course demonstrating the concepts of the class objectives while actually utilizing specific heavy equipment.

- The classroom should be free from outside interruptions and interferences.
- Provide adequate room and flexibility for student work groups and equipment, including supportive facilities such as break areas, restrooms, etc.
- The classroom should have controlled lighting, good acoustics, and good ventilation.
- Provide adequate access to copy and printing services.
- Provide adequate desk space and power outlets for laptop computers (one power strip for each table).
- Be sure a computer with projector and screen is available to show electronic presentations.
- If printing in the classroom, a laptop and driver for the printer will be needed.
- 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.

## XII. STUDENT ASSESSMENT AND CERTIFICATION

Students must obtain a score of 70% or higher on the student assessment evaluation method chosen to receive a certificate of completion for the course.

### 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. Student Assessment

The final exam consists of 30 questions and should be completed within 1 hour. The final exam and answer key are in Appendix D.

**Heavy Equipment Boss, S-236**  
*Sample Nomination Letter*

To:            *Student's Name*

From:        *Course Coordinator's Name*

Subject:     *Course#, Course Title*

Congratulations! You have been tentatively selected to attend the Heavy Equipment Boss, S-236 course, to be held at *location* presented by *Name of Training Unit and location*. The course will begin promptly at *time and date* and end at *time and date*. Please arrange your travel accordingly, as you must attend the entire course to receive credit.

The primary emphasis of this course focuses on duties of the Heavy Equipment Boss (HEQB) position within the Incident Command System.

The pre-course work package developed for Heavy Equipment Boss is designed to help you prepare for and successfully complete the course, and to allow us to evaluate your readiness. The pre-course work package for the course (consisting of reading, tutorials, and knowledge checks) is provided at the NWCG Training Branch website: <http://training.nwcg.gov>. Visit the website to download instructions and materials.

Previous experience indicates it will take as much as 2 hours to complete the pre-course work. You may be tempted to wait until a day or two before the deadline to complete your pre-course work, but it is highly recommended that you allow sufficient time to complete the work.

Use the pre-course work checklist to make sure you have completed and returned everything required.

**In the event that you cannot attend this course, please contact me no later than *enter date*, as there are typically several students on the course waitlist.** Cancellations after this date may result in your home unit being charged for course tuition.

If you have any questions or concerns about the pre-course work or classroom session please feel free to contact Lead Instructor, *insert name* or Course Coordinator *insert name*. Their contact information is listed below.

In the event you cannot attend the course, please contact the course coordinator 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.

*Lead Instructor*  
*Name*  
*Phone number*  
*Email address*

*Course Coordinator*  
*Name*  
*Phone number*  
*Email address*



**Heavy Equipment Boss, S-236**  
*Sample Course Selection Letter*

To:            *Student's Name*

From:        *Course Coordinator's Name*

Subject:     Heavy Equipment Boss, S-236

Congratulations, you have been selected to attend the Heavy Equipment Boss, S-236 course to be held at *(location)*. The course will begin promptly at *(time and date)* and end at *(time and date)*.

The primary emphasis of this course focuses on duties of a Heavy Equipment Boss (HEQB) within the Incident Command System.

Please bring the following references to class:

- Unit Leader Position Task Book (initiated at the home unit), located at <http://www.nwcg.gov/pms/pms.htm>.
- Wildland Fire Incident Management Field Guide located at <http://www.nwcg.gov/pms/pubs/pubs.htm>.
- Incident Response Pocket Guide (PMS 461, NFES 1077), located at <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 before the scheduled course completion time.

In the event you cannot attend the course, please contact the course coordinator before the beginning of the class. This allows time for notifying students who may 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, at phone number, or email address*.



**Heavy Equipment Boss, S-236**  
*Sample Agenda*

**Day 1**

Unit 0 – Introduction ..... 1 hour

Unit 1 – Administration ..... 2 hours

Unit 2 – Equipment Identification ..... 3 hours

***Lunch***

Unit 3A – Equipment Inspection ..... 2 hours

*Cadre Meeting (Course Review)*

**Day 2**

Unit 4 – Briefings and Tactics ..... 3 hours

***Lunch***

Unit 5 – Safety ..... 2 hours

### **Day 3**

Unit 3B – Optional Field Exercise.....4 hours

#### ***Lunch***

Unit 6 – All Hazard Assignments .....2 hours

Final Exam ..... 1 hour

*Issue Course Certificates*

*Cadre Meeting (Course Closeout)*

## **UNIT OVERVIEW**

**Course**      Heavy Equipment Boss, S-236

**Unit**          0 – Introduction

**Time**          1 Hour

### **Objectives**

1.     Introduce the course coordinator, instructors, and students.
2.     Discuss course logistics.
3.     Provide a course overview.
4.     Discuss course expectations.
5.     Identify course reference materials.
6.     Discuss position responsibilities.

### **Strategy**

This unit is an introduction to the course. It involves student and cadre interaction through introductions and a group exercise.

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

- Informal lecture
- Classroom discussion
- Interactive group discussion

### **Instructional Aids**

- ☐    Computer with projector, screen, and presentation software
- ☐    Sign-in sheet
- ☐    Flip charts and markers
- ☐    Position task book

### **Exercise**

- Student expectations for the course

### **Evaluation Method**

- Review and address questions for student clarification.

## **Outline**

- I. Welcome and Introductions
- II. Course Logistics
- III. Course Overview
- IV. Course Expectations
- V. Position Descriptions

## **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** Heavy Equipment Boss, S-236

**Unit** 0 – Introduction

OUTLINE	AIDS & CUES
<b>Present NWCG Mission Statement slide.</b>	Slide 0-1
<b>Present course and unit title slide.</b>	Slide 0-2
<b>Present unit objectives.</b>	Slide 0-3
I. WELCOME AND INTRODUCTIONS	Slide 0-4
<b>Introduce course coordinator, instructors, and students.</b>	
<b>Use any method desired for introductions.</b>	
<b>Have students provide the following information:</b>	
<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 data-bbox="203 281 646 317">II. COURSE LOGISTICS</p> <div data-bbox="207 369 1055 428" style="border: 1px solid black; padding: 2px;"> <p data-bbox="219 380 812 415"><b>Discuss the following as appropriate:</b></p> <ul data-bbox="310 474 617 596" style="list-style-type: none"> <li data-bbox="310 474 617 510">• Course agenda</li> <li data-bbox="310 558 617 596">• Sign-in sheet</li> </ul> </div> <div data-bbox="207 646 1055 747" style="border: 1px solid black; padding: 2px;"> <p data-bbox="219 657 987 737"><b>Circulate the class registration form or a sign-in sheet for students to sign.</b></p> <ul data-bbox="310 793 1019 1299" style="list-style-type: none"> <li data-bbox="310 793 500 829">• Breaks</li> <li data-bbox="310 877 976 999">• Facility locations (restrooms, vending machines, drinking fountains, smoking areas, evacuation policy, etc.)</li> <li data-bbox="310 1050 656 1085">• Message location</li> <li data-bbox="310 1134 660 1169">• Cell phone policy</li> <li data-bbox="310 1218 1019 1299">• Local information (restaurants, local map, transportation)</li> </ul> </div>	<p data-bbox="1079 281 1218 317">Slide 0-5</p>



OUTLINE	AIDS & CUES
<p data-bbox="203 281 654 317">III. COURSE OVERVIEW</p> <p data-bbox="298 365 1040 575">This course is designed to meet the training needs of a Heavy Equipment Boss (HEQB) as outlined in the Wildland Fire Qualifications System Guide (PMS 310-1) and the position task book developed for the position.</p> <p data-bbox="298 623 670 659">A. Course Objectives</p> <p data-bbox="394 707 1040 785">At the successful completion of this course, students will be able to:</p> <ol data-bbox="394 833 1040 1556" style="list-style-type: none"> <li data-bbox="394 833 1040 911">1. Identify the administrative duties and procedures required of a HEQB.</li> <li data-bbox="394 959 1040 1079">2. Identify and demonstrate the heavy equipment inspection process and related duties of the HEQB.</li> <li data-bbox="394 1127 1040 1247">3. Demonstrate the actions required of a heavy equipment boss to safely and effectively complete an assignment.</li> <li data-bbox="394 1295 1040 1415">4. Discuss relevant information and methods for communication and tactics related to heavy equipment.</li> <li data-bbox="394 1463 1040 1556">5. Identify the process of preparing for an all hazard assignment.</li> </ol>	<p data-bbox="1079 281 1219 317">Slide 0-6</p> <p data-bbox="1079 623 1219 659">Slide 0-7</p> <p data-bbox="1079 1304 1219 1339">Slide 0-8</p>

OUTLINE	AIDS & CUES
<p data-bbox="298 281 724 317">B. Instructional Methods</p> <ol data-bbox="396 365 1008 705" style="list-style-type: none"> <li data-bbox="396 365 1008 449">1. Facilitation and short lectures with PowerPoint presentations.</li> <li data-bbox="396 491 656 527">2. Discussion</li> <li data-bbox="396 575 634 611">3. Exercises</li> <li data-bbox="396 659 781 705">4. Field-day exercises</li> </ol> <div data-bbox="220 758 1013 926" style="border: 2px solid black; padding: 5px;"> <p><b>Instructor must find qualified Heavy Equipment operators/mechanics to aid in facilitating the field day portion. Field day guidelines will be found in Unit 3B.</b></p> </div>	<p data-bbox="1081 281 1219 317">Slide 0-9</p>
<p data-bbox="298 984 878 1020">C. Evaluating Student Performance</p> <p data-bbox="396 1068 943 1146">To successfully complete the course, students must:</p> <ul data-bbox="396 1194 1049 1488" style="list-style-type: none"> <li data-bbox="396 1194 1049 1278">• Participate in all classroom discussions, exercises, and scenarios.</li> <li data-bbox="396 1327 1049 1488">• Students must obtain a score of 70% or higher on the final exam to receive a certificate of completion for the course.</li> </ul>	<p data-bbox="1081 984 1235 1020">Slide 0-10</p>

OUTLINE	AIDS & CUES
<p>D. Student Training Course Evaluation Form</p> <p>Students are given the opportunity to comment on the course, the units, and the quality of instruction at the end of the course.</p>	<p>Slide 0-11</p>
<p>E. Course Reference Materials</p> <p>Below is a list of materials that are referenced throughout the course:</p> <ul style="list-style-type: none"> <li>• Incident Response Pocket Guide (PMS 461)</li> <li>• Wildland Fire Qualification System Guide (PMS 310-1)</li> <li>• Interagency Standards for Fire and Fire Aviation Operations (Red Book)</li> </ul>	<p>Slide 0-12</p>

OUTLINE	AIDS & CUES
<p data-bbox="203 281 732 317">IV. COURSE EXPECTATIONS</p> <p data-bbox="298 365 711 401">A. Student Expectations</p> <p data-bbox="203 449 1003 485"><b>EXERCISE: Student Expectations for the Course</b></p> <p data-bbox="203 533 1003 611"><u>Purpose:</u> Students develop a list of their expectations for the course.</p> <p data-bbox="203 659 477 695"><u>Time:</u> 10 minutes</p> <p data-bbox="203 743 1024 821"><u>Format:</u> Students work in small groups of three to five students.</p> <p data-bbox="203 869 846 905"><u>Materials Needed:</u> Flip charts and markers</p> <p data-bbox="203 953 391 989"><u>Instructions:</u></p> <ol data-bbox="203 1037 1036 1640" style="list-style-type: none"> <li data-bbox="203 1037 1036 1241">1. Instruct groups to write their responses to the following question on a flip chart: <ul data-bbox="298 1163 959 1241" style="list-style-type: none"> <li data-bbox="298 1163 959 1241">• What do you expect to learn from this course?</li> </ul> </li> <li data-bbox="203 1289 1036 1367">2. Have each group present their expectations to the class.</li> <li data-bbox="203 1415 634 1451">3. Answer any questions.</li> <li data-bbox="203 1499 1036 1640">4. Post lists around the room and refer to them throughout the course to ensure students' expectations are being met.</li> </ol> <p data-bbox="203 1688 461 1724"><b><u>End of Exercise.</u></b></p>	<p data-bbox="1079 449 1235 485">Slide 0-13</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 a Heavy Equipment Boss (HEQB).</li> <li>• Have completed their pre-course work.</li> <li>• Exhibit mutual cooperation with the group.</li> <li>• Participate actively in all of the training exercises presented in the course.</li> <li>• Return to class at stated times.</li> <li>• Have all questions answered.</li> </ul>	<p>Slide 0-14</p>
<p>V. POSITION DESCRIPTIONS</p> <p>A. The Heavy Equipment Boss (HEQB) will be covered in detail throughout the course.</p> <ul style="list-style-type: none"> <li>• The Heavy Equipment Boss is the direct supervisor of one or more pieces of heavy equipment assigned to an incident. This can be for agency or contracted equipment.</li> <li>• The Heavy Equipment Boss is supervised by the IC, DIVS, TFLD, or STEQ, depending on the nature and complexity of the incident.</li> </ul>	<p>Slide 0-15</p>

OUTLINE	AIDS & CUES
<p data-bbox="300 281 976 321">B. Position Task Book (PTB) Description</p> <p data-bbox="394 365 1057 489">The PTB contains common tasks for all unit leaders and additional specific tasks for the (HEQB).</p> <div data-bbox="207 541 1052 640"> <p><b>Have students compare the HEQB tasks in the FHB with the tasks in the PTB.</b></p> </div> <p data-bbox="394 684 1024 766">The PTB is the primary tool for observing and evaluating performance.</p> <p data-bbox="394 814 1008 938">In the current performance based system, trainees must complete the tasking in the PTB to become qualified as a HEQB.</p> <p data-bbox="394 987 1036 1068">The PTB can only be initiated by the home unit, not at this course.</p> <div data-bbox="207 1117 1052 1215"> <p><b>Ask students if they have any questions concerning the FHB or PTB.</b></p> </div> <div data-bbox="207 1264 1052 1362"> <p><b>Review the online pre-course work with students to ensure comprehension.</b></p> </div>	<p data-bbox="1081 281 1235 321">Slide 0-16</p>
<div data-bbox="207 1415 1052 1556"> <p><b>Review unit objectives.</b></p> <p><b>Answer students' questions.</b></p> </div>	<p data-bbox="1081 1407 1235 1446">Slide 0-17</p>

## **UNIT OVERVIEW**

**Course**      Heavy Equipment Boss, S-236

**Unit**          1 – Administration

**Time**          2 hours

### **Objectives**

1.    Describe the contracting and use responsibilities of the Heavy Equipment Boss, the Logistics Section, the Finance/Administration Section, and the Operations Section.
2.    Identify the inspection, sign-up, and demobilization responsibilities of the Heavy Equipment Boss.
3.    Identify specific information the Heavy Equipment Boss should obtain from the operator before beginning work.
4.    Describe pre-use inspection of heavy equipment, identify any deficiencies, and describe any corrective actions required.

### **Strategy**

This unit covers the responsibility of the HEQB regarding administrative duties (e.g., check-in, demobilization, contracting paperwork, inspection forms, etc.). The duties detailed in this unit do not encompass all of the duties a HEQB will be responsible for; however it does outline the major tenants of the HEQB's job.

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

- Informal lecture
- Classroom discussion
- Interactive group discussion

## **Instructional Aids**

- ☐ Personal computer with LCD projector and presentation software
  - Clicker, wireless pointer
  - Access to Google Earth
- ☐ Flip chart/Markers/Dry erase board
- ☐ Handouts for exercise
  - Complete IBPA form
  - Resource order (filled in)
  - OF-296, partially completed (sections II-IV and VI)
  - OF-297 – Emergency Equipment Shift Ticket
  - ICS-213 – General Message form
  - Optional form 304-Emergency Fuel/oil
  - Unit log, ICS-214

## **Exercise**

- IBPA Exercise

## **Evaluation Methods**

- Student and classroom participation.
- Complete the unit exercise.

## **Outline**

- I. Check-In
- II. Demobilization
- III. Time Keeping
- IV. Heavy Equipment Contracts and Agreements
- V. Contract Information
- VI. Contract Authority
- VII. Interaction with Ground Support
- VIII. Operator Capabilities



## **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:** Heavy Equipment Boss, S-236

**Unit:** 1 – Administration

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>	Slide 1-1
<b>Present Unit Objectives.</b>	Slide 1-2 Slide 1-3
I. CHECK-IN	Slide 1-4
<p>The check-in procedures for initial attack are to contact dispatch and receive your orders. Prior to leaving for the incident you should make sure you have your kit together. This kit contains items you may need on the incident and as a HEQB should carry with you at all times.</p>	Slide 1-5
<b>TIP</b> <b>The HEQB's vehicle will become a mini-supply cache; the HEQB needs to be prepared for any situation.</b>	
<p>The kit items should include but are not limited to the following items:</p> <ul style="list-style-type: none"><li>• Clinometer/compass</li><li>• Fence pliers</li><li>• Flagging</li><li>• Light sticks</li></ul>	Slide 1-6



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Water</li> <li>• Cooler</li> <li>• Sleeping bag</li> <li>• Extra PPE</li> <li>• Fire extinguisher</li> <li>• Chainsaw</li> <li>• All-terrain vehicle (ATV) can be a valuable asset if available.</li> </ul> <p>Many of these items will need to be checked out at the supply unit when arriving at the incident.</p> <p>Upon dispatch you may be assigned a piece of equipment at an agency facility, roadside en route to the incident, or at the incident.</p>	<p>Slide 1-9</p>
<p>In these cases equipment has usually been contracted through the local agency, and has received a pre-season inspection. Prior to accepting the piece of equipment, you should perform a roadside inspection (equipment, personnel, and paperwork).</p>	<p>Slide 1-10</p>

OUTLINE	AIDS & CUES
<p>On a Type 3 incident you will usually check-in at the incident. Depending on the team organization you may receive your assignment, and equipment from the Incident Commander (IC). Check with IC to see if the roadside inspection has been completed. You should still perform a walk around inspection of the equipment before proceeding to your assignment, and document (preferably using photographs) any issues.</p>	<p>Slide 1-11</p>
<p>On Type 1 and Type 2 incidents you will follow the normal check-in procedures you learned in the S-230 Crew Boss course. On these types of incidents you will usually be assigned a piece of equipment on your first shift.</p>	<p>Slide 1-12</p>
<p>When you are assigned a piece of equipment you should complete a walk around inspection.</p>	
<p>II. DEMOBILIZATION</p>	<p>Slide 1-13</p>
<p>Heavy Equipment Boss (HEQB) responsibilities during demobilization include ensuring all equipment time, fuel, and repair services have been properly documented, and turned in. The final inspection of the equipment has been completed, documented, and any checked out equipment has been accounted for.</p>	<p>Slide 1-14</p>
<p>Ensure the Standard Contractor Performance Report (found exhibit E of Incident Blanket Purchase Agreement [IBPA]) is completed, turned in, and a copy is given to the operator.</p>	<p>Slide 1-15</p>

OUTLINE	AIDS & CUES
<p>Work with the Ground Support Unit to ensure required state regulations for permits are in place before equipment is released. Agency and contracted equipment arrives on incident with a permit waiver. Upon demobilization equipment will need to obtain permits which may include weekend restrictions and the necessity of pilot vehicle(s).</p> <div data-bbox="207 667 1052 1108" style="border: 2px solid black; padding: 10px;"> <p><b>TIPS</b></p> <ul style="list-style-type: none"> <li>• <b>Photographs of the equipment should be taken during the final inspection.</b></li> <li>• <b>Objectively document your actions, conversations, and decisions on your Unit Log</b></li> <li>• <b>If you do not have a vehicle, get General Message forms from your supervisor requesting a four-wheel-drive vehicle with good clearance as soon as possible.</b></li> </ul> </div>	<p>Slide 1-16</p>
<p>III. TIME KEEPING</p> <p>HEQB responsibilities are more complex than for a Crew Boss or an Engine Boss. The HEQB is responsible for specific forms related to contracting, and must work closely with Finance (Time Unit), and Ground Support.</p> <p>Time Unit will have personnel time recorders, and equipment time recorders to track hours. Agency owned equipment usually will not have to turn in an Emergency Equipment Shift Ticket (OF-297) but they will have to turn in a Crew Time Report (SF-261) to the personnel time recorder.</p>	<p>Slide 1-17</p> <p>Slide 1-18</p> <p>Slide 1-19</p>

OUTLINE	AIDS & CUES
<p>Non-agency owned equipment will have to fill-in a Shift Ticket and turn it in to the Equipment Time Recorder on a daily basis. The HEQB is responsible to validate or complete the Shift Ticket. The Shift Ticket must be signed by the HEQB or the direct supervisor of the equipment (Task Force Leader or Division Group Supervisor) of the division that the equipment is assigned to for that operational period.</p> <p>Actual hours must be recorded on the Shift Ticket, including meal breaks. This is important to ensure personnel are working within the work/rest ratio guidelines.</p> <p>Equipment will often come with a transport (tractor trailer) and transport driver, which may or may not require its own Shift Ticket. Verify with the Ground Support Unit Leader, who is responsible for signing the transport Shift Ticket. In addition, there may be different rates assigned to the transport for staging.</p> <div data-bbox="207 1266 1052 1409" style="border: 2px solid black; padding: 5px;"> <p><b>Discussion Point</b>  <b>Transport can sometimes be ordered as a service number (e.g., S-1).</b></p> </div>	<p>Slide 1-20</p>



OUTLINE	AIDS & CUES
<div data-bbox="207 283 1052 384" style="border: 2px solid black; padding: 5px; margin-bottom: 20px;"> <p><b>Use the actual form if possible, not the copied form.</b></p> </div> <p>A. Forms</p> <ul style="list-style-type: none"> <li>• Emergency Equipment Shift Ticket (OF-297)</li> </ul> <p>Complete the Emergency Equipment Shift Ticket daily and submit to Equipment Time Recorder.</p> <ol style="list-style-type: none"> <li>1. Agreement No. Enter number from Block 2 of the EERA or Block 2 of the IBPA.</li> <li>2. Contractor. Enter the contractor's name as shown in Block 4 of the EERA or Block 17a of the IBPA. Enter the contractor's resource order number.</li> <li>3. Incident or Project Name. Enter incident name.</li> <li>4. Incident Number. Enter the incident number.</li> <li>5. Operator. Enter the names of all operators in Block 14, Remarks; note the operational periods that each operator was on duty.</li> </ol>	<p>Slide 1-21</p> <p>Hand out actual OF-297 form</p>

OUTLINE	AIDS & CUES
<ol style="list-style-type: none"> <li data-bbox="492 283 1052 661">6. Equipment Make. Enter the make of equipment from Block 9 of the EERA or the Schedule of Items or the Resource Category form of the IBPA. (Note: Blocks 6 through 8 should reflect what is shown on the EERA or IBPA and provided by the contractor.)</li> <li data-bbox="492 709 1052 919">7. Equipment Model. Enter the model of equipment from Block 9 of the EERA or the Schedule of Items or Resource Category form of the IBPA.</li> <li data-bbox="492 968 1052 1129">8. Operator. Check one, in accordance with Block 6 of the EERA or Clause D.1 of the IBPA.</li> <li data-bbox="492 1178 1052 1430">9. Serial Number. Enter serial number of equipment from Block 9 of the EERA or the Schedule of Items or the Resource Category form of the IBPA.</li> <li data-bbox="492 1478 1052 1688">10. License Number. If equipment is licensed, enter license number of equipment (off-road, heavy equipment normally is not licensed).</li> <li data-bbox="492 1736 1052 1894">11. Operating Supplies. Check one, in accordance with Block 7 of the EERA or Clause D.21.4 of the IBPA.</li> </ol>	

OUTLINE	AIDS & CUES
<p>12. Date. Enter date of use.</p> <p>13. Equipment Use. Circle hours, days, or miles as per Block 11 of the EERA or the Schedule of Items or Resource Category form of the IBPA. Record the actual hours worked. Enter the start and stop times or beginning and ending mileage in the columns designated as Start/Stop. Calculate the hours worked or miles driven and enter in the Work column. If the rate of pay is by the day, enter "1".</p> <p>(See Clause 7A of the EERA or the Schedule of Items or the Resource Category form of the IBPA.)</p> <p>Enter any information in the "Special" column required in Block 12 of the EERA or the Schedule of Items in the IBPA.</p> <p>14. Remarks. Enter any information necessary to administer the terms of the EERA or IBPA.</p> <p>15. Equipment Status. Mark the appropriate blocks.</p> <p>16. Invoice Posted By. Enter time recorder initials.</p>	

OUTLINE	AIDS & CUES
<p>17. Contractor's or Authorized Agent's Signature. To be completed and signed by the appropriate contractor representative, normally at the end of each work shift or break in operational periods.</p> <p>18. Government's Officer's Signature. To be signed by the incident official responsible for the immediate supervision of the equipment.</p> <p>19. Date Signed. Enter the date shift ticket is signed.</p>	
<p>B. Crew Time Report (CTR, SF-261)</p>	<p>Slide 1-22</p>
<p>Complete CTR daily and submit to Personnel Time Recorder.</p>	<p>Hand out actual SF-261 form</p>
<p>C. Emergency Equipment Rental Agreement (EERA) (OF-294)</p>	<p>Hand out actual OF-294 form</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>EERA will be discussed later in this unit.</b></p> </div>	

OUTLINE	AIDS & CUES
<p data-bbox="203 283 974 361">IV. HEAVY EQUIPMENT CONTRACTS AND AGREEMENTS</p> <div data-bbox="207 415 1052 888" style="border: 2px solid black; padding: 10px;"> <p data-bbox="219 422 993 882"><b>Make sure the students understand these are Federal contracts and agreements, and in some cases State agreements that are available. Some geographical areas have supplements to the Interagency Incident Business Management Handbook (IIBMH), Chapter 20 to identify the requirements of specific equipment to issue Emergency Equipment Rental Agreements (EERA). Incident Blanket Purchase Agreements (IBPA) include the specific equipment requirements (Section D).</b></p> </div>	<p data-bbox="1079 283 1234 319">Slide 1-23</p>
<p data-bbox="300 945 974 1022">A. Incident Blanket Purchase Agreements (IBPA)</p> <ul style="list-style-type: none"> <li data-bbox="397 1071 917 1106">• Most common contract used</li> </ul> <p data-bbox="490 1155 1042 1360">Generally, these contracts are the most commonly used by agencies during high activity to provide heavy equipment support as needed for the duration of the incident.</p> <ul style="list-style-type: none"> <li data-bbox="397 1413 1031 1575">• The contracted equipment should be carrying two copies of their IBPA; one copy for the HEQB and one for themselves.</li> <li data-bbox="397 1623 971 1659">• Used for unspecified timeframe.</li> </ul> <p data-bbox="490 1707 1042 1873">Provides the agencies with a contract to obtain service from a heavy equipment vendor on a call-when-needed basis.</p>	<p data-bbox="1079 940 1234 976">Slide 1-24</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Awarded every 3 years (typically)</li> <li style="padding-left: 40px;">The call-when-needed contracts are solicited and awarded typically every 3 years. Contractors that have been awarded the agreement may only replace equipment when approved by the contracting officer.</li> <li>• Used nationally</li> </ul> <p>B. Emergency Equipment Rental Agreement (EERA) (incident only)</p> <ul style="list-style-type: none"> <li>• Typically used: <ul style="list-style-type: none"> <li>- Initial attack</li> <li>- After IBPA resources have been exhausted</li> <li>- Specialized equipment not signed up during the IBPA competitive process</li> </ul> </li> <li>• Only awarded for the duration of the incident</li> <li>• Used nationally</li> <li>• Standard for some state agencies</li> </ul>	<p>Slide 1-25</p>
<div style="border: 2px solid black; padding: 10px;"> <p><b>Some state agencies allow a HEQB to use an EERA and negotiate a rate for the closest resource not under an existing agreement. This type of agreement can be used until contracted resources are in place.</b></p> </div>	

OUTLINE	AIDS & CUES
<p>C. Cooperative Agreements</p> <ul style="list-style-type: none"> <li>• State, local, or rural fire departments</li> <li>• Check with the local agency for specific guidelines.</li> </ul> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p><b>Discussion Point</b></p> <ul style="list-style-type: none"> <li>• <b>Where do you find the different types of contracts and agreements?</b></li> </ul> <p><b>The IBPA may be found at the Virtual Incident Procurement (VIPR) website:</b></p> <p><b><a href="http://www.fs.fed.us/business/incident/vipr.php">www.fs.fed.us/business/incident/vipr.php</a></b></p> <p><b>All competitively awarded IBPAs can be accessed at this website.</b></p> <p><b>EERAs can be obtained from the Finance Section on the incident or from the vendor.</b></p> </div>	<p>Slide 1-26</p>
<p>V. CONTRACT INFORMATION</p> <p>Copies of the IBPA, EERA, and State Cooperative Agreements can be obtained from the Finance Section or the vendor (initial attack).</p> <p>IBPA, EERA, and State Cooperative Agreements contain all pertinent information regarding equipment requirements, vendor information, and pricing.</p>	<p>Slide 1-27</p> <p>Slide 1-28</p> <p>Slide 1-29</p>

OUTLINE	AIDS & CUES
<p>VI. CONTRACT AUTHORITY</p> <p>A. Contracting Officer (CO)</p> <p>The CO is the appointed government official with the authority to enter into, administer, and terminate the agreement.</p> <p>B. Contracting Officer's Representative (COR)</p> <p>Authorized to take actions necessary to assure compliance with the technical provisions of the contract.</p> <p>Most CORs are designated at geographical areas.</p> <p>Project Inspectors (PI) perform duties onsite on behalf of a remotely located COR.</p> <p>HEQBs are responsible for the onsite contract administration of the resource assigned to them, but have no delegated authority.</p> <div data-bbox="207 1392 1052 1493" style="border: 2px solid black; padding: 5px;"> <p><b>PIs are not appointed to the IBPA; the HEQB is expected to fill that role.</b></p> </div>	<p>Slide 1-30</p> <p>Slide 1-31</p>
<p>C. HEQB Role</p> <p>“these heavy equipment contractors are businessmen, be clear with them up-front and it will make everything go more smoothly,.....they expect to operate professionally”</p>	<p>Slide 1-32</p>





OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Provides an honest performance evaluation on the Standard Contactor Performance Report form, and ensures a copy is provided to the vendor and Finance Section.</li> </ul> <p data-bbox="394 625 961 703">2. Solicitation/Contract/Order For Commercial Items, SF-1449</p> <p data-bbox="488 751 1052 1087">This form is commonly referred to as the SF-1449 and is used as contractor agreement coversheet. This form is the source of information a HEQB needs to complete an Emergency Equipment Shift Ticket, OF-297 and Vehicle/Heavy Equipment Inspection Checklist, OF-296.</p> <ul style="list-style-type: none"> <li>• Block 2 – Contract Number</li> <li>• Block 3 – Award/Effective Date</li> <li>• Block 17a – Contractor/ Offeror</li> <li>• Page 2 – Schedule of Items <ul style="list-style-type: none"> <li>- HEQB will verify that the vehicle identification number (VIN) numbers of the equipment onsite matches the contract.</li> </ul> </li> </ul>	<p data-bbox="1081 625 1235 657">Slide 1-36</p> <p data-bbox="1081 751 1235 783">Slide 1-37</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Section D <ul style="list-style-type: none"> <li>- D.1 – Scope of Agreement, provides an overview of the agreement.</li> <li>- D.2 – Equipment Requirements, provides the technical specifications for the equipment.</li> <li>- D.3 – Personnel Requirements, provides training standards for equipment operators.</li> <li>- D.7 – Property, provides what may and may not be provided to vendor.</li> <li>- D.17 – Incident Pre-Use Inspection, provides overview of the incident inspection process.</li> <li>- D.19 – Workmanship, provides information regarding performance standards.</li> <li>- D.20 – Performance Evaluations, provides information used when evaluating the contractor’s performance.</li> </ul> </li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>- D.21 – Payments, provides an overview of the business practices including payment, repairs, and operating supplies</li> <li>• Exhibit E – Incident Blanket Purchase Agreement (IBPA) Performance Evaluation</li> </ul> <p>The administrative information on Exhibit E is obtained from page 1 of the SF-1449 and the resource order.</p> <p>Thoroughly document any unsatisfactory, marginal, exceptional ratings, including any unusual events that may have occurred. For example, the operator does not attend operational briefing and arrives on the line late several times during the assignment.</p> <p>Any unsatisfactory performance that cannot be mitigated through verbal communication, should be documented, and elevated through the chain-of-command to the Contracting Officer.</p>	<p>Slide 1-38</p> <p>Slide 1-39</p>

OUTLINE	AIDS & CUES
<p><b>Tips</b></p> <ul style="list-style-type: none"> <li>• <b>Gifts from contractors should not be accepted.</b></li> <li>• <b>Do not encourage or comment on potential contractor's claims.</b></li> <li>• <b>Maintain a professional working relationship with contractors.</b></li> <li>• <b>When filling out Emergency Equipment Shift Ticket, OF-297, write legibly, complete all blocks, obtain all proper signatures, and turn-in daily to the Finance Section.</b></li> <li>• <b>The contracting world can be complicated, if you have questions, ask. The Finance Section is there to help.</b></li> <li>• <b>On a daily basis complete a Unit Log, ICS-214.</b></li> <li>• <b>Document any unusual occurrence on a General Message Form, ICS-213. Use only facts and avoid using opinions.</b></li> <li>• <b>Ensure General Message Form is submitted to your supervisor and document on your ICS-214.</b></li> <li>• <b>Be sure to answer questions from the Finance Section related to equipment damage or breakdowns in detail.</b></li> </ul>	
<p><b>IBPA Exercise, see IR 1-1 for instructions.</b></p>	<p>Slide 1-40 IR 1-1 SR 1-1</p>
<p><b>Discussion Point:</b> <b>What would happen if operator forgot his Nomex or other PPE?</b></p>	

OUTLINE	AIDS & CUES
<p data-bbox="396 281 870 321">3. Transports for equipment</p> <p data-bbox="490 365 1036 491">Transportation for equipment varies. Check with the hosting agency for proper procedures.</p> <p data-bbox="490 535 1045 745">Verify if the equipment and transport was ordered as one unit or ordered separately. Verification should be handled by reviewing the resource order the operator will have.</p> <p data-bbox="490 789 1029 1171">Relay this information to your supervisor. They will make the determination if they want to keep the transport on the line or release it back to Ground Support. Document the decision on a General Message form, ICS-213 for the Ground Support Unit and document on your Unit Log, ICS-214.</p> <p data-bbox="490 1215 1045 1428">In the remarks section of the Emergency Equipment Shift Ticket, OF-297, note the transport operator's name and whether the transport was retained with the heavy equipment.</p>	<p data-bbox="1081 281 1230 321">Slide 1-41</p>

OUTLINE	AIDS & CUES
<div data-bbox="207 283 1052 1150" style="border: 1px solid black; padding: 10px;"> <p><b>Discussion Point</b></p> <p><b>Discuss the responsibilities of the HEQB, who is responsible for transport, and the paperwork required for the following scenarios:</b></p> <ul style="list-style-type: none"> <li>• <b>Transport delivers the heavy equipment to the line and is released to go back to its home base.</b></li> <li>• <b>Transport delivers the heavy equipment to the line and is ordered to return back to camp or staging.</b></li> <li>• <b>Transport is married to the heavy equipment and staged on the fireline.</b></li> <li>• <b>Transport delivers the heavy equipment to the fireline and is released from the incident but the heavy equipment operator was also the transport driver.</b></li> <li>• <b>Transport is used to move multiple pieces of heavy equipment around the incident.</b></li> </ul> </div> <p><b>D. Conflicts or Disagreements</b></p> <p>Conflicts or disagreements when working with heavy equipment can happen at any time and in any environment.</p> <p>Objective communication is always the best starting point in any type of disagreement. The HEQB must strive to be objective and maintain a professional attitude when working through conflicts or problems.</p> <p>Documentation is the key to ensuring that the conflict solution is clearly defined as understood by all parties.</p>	<p>Slide 1-42</p>

OUTLINE	AIDS & CUES
<p>The HEQB should follow the appropriate chain-of-command in the beginning of the documentation process to ensure that they are not outside their scope of authority or committing the government to unobtainable solutions.</p> <p>Below is a general contact guideline for requesting assistance:</p> <ul style="list-style-type: none"> <li>• If the problem is contractual and operational related, contact your supervisor.</li> <li>• If your supervisor, or his supervisor cannot solve the problem, they may have you contact the Finance Section Chief.</li> </ul> <div style="border: 1px solid black; padding: 10px; margin-top: 20px;"> <p><b>Tips for HEQB with Conflicts or Disagreements</b></p> <ul style="list-style-type: none"> <li>• <b>It is important that the HEQB objectively document all events, conversations, and actions taken concerning a conflict or disagreement. Only use facts.</b></li> <li>• <b>Always keep the immediate supervisor apprised of any conflicts, discussions, or problems that may come up during operations.</b></li> <li>• <b>Protect your good working relationship with the contractor by not spending unproductive time arguing with them. Contact the appropriate level of supervision early in the discussions for help and advice.</b></li> </ul> </div>	



OUTLINE	AIDS & CUES
<p>VII. INTERACTION WITH GROUND SUPPORT</p> <p>Interaction with the Ground Support Unit is important to ensure that the piece of equipment you are assigned has been properly inspected, and is ready for an assignment. You will still need to do you daily walk around inspection of the equipment.</p> <p>The Ground Support Unit is responsible to ensure transportation to and from the incident has been arranged, and service and fuel needs are in place. Ground support needs to arrange a secure area for staging of the heavy equipment.</p> <p>Copies of damage reports, maintenance repairs, and inspections should be turned in to the Ground Support Unit.</p> <p>In case that Ground Support Unit is not in place you will need to contact the Logistics Section Chief to find out what the interim process is.</p> <p>Report any unused or abandoned equipment to the Ground Support Unit.</p>	<p>Slide 1-43</p> <p>Slide 1-44</p> <p>Slide 1-45</p> <p>Slide 1-46</p>
<p>VIII. OPERATOR CAPABILITIES</p> <p>HEQB should speak to the operator before starting a shift to identify their experience and knowledge with the particular piece of equipment, and familiarity with firefighting tasks.</p> <p>Find out what arrangements have been made for service and fueling, and how many hours they have been working before this assignment. Assess the suitability of the operator and the equipment to meet needs of the assigned tasks.</p>	<p>Slide 1-47</p> <p>Slide 1-48</p> <p>Slide 1-49</p>

OUTLINE	AIDS & CUES
<b>TIP</b> <b>It is a good practice to document the discussion with the operator.</b>	
<b>Review unit objectives.</b>	

Slide 1-50  
Slide 1-51

## **EXERCISE: Incident Blanket Purchase Agreement (IBPA)**

Purpose: Allow students the opportunity to become familiar with parts of the IBPA, SF-1449 and Section D.

Time: 25 minutes to complete each part.

Format: Students will work individually.

### Materials Needed:

Handouts: Use **actual forms** listed below.

- Complete IBPA form
- Resource order (filled in)
- OF-296, partially completed (pre-use sections)
- OF-297 – Emergency Equipment Shift Ticket
- ICS-213 – General Message form
- Unit Log, ICS-214
- OF-304 Emergency Fuel and Oil

### Day 1 Scenario

- Complete IBPA
- Resource order
- OF-296, partially completed (pre-use sections )
- Emergency Equipment Shift Ticket, OF-297 (blank)

### Day 2 Scenario

- Complete IBPA
- Resource order
- OF-296, partially completed (pre-use sections ) Emergency Equipment Shift Ticket, OF-297 (blank)
- General Message Form, ICS-213 (blank)
- Unit Log, ICS-214 (blank)

### Day 3 Scenario

- Complete IBPA
- Standard Contractor Performance Report (found in exhibit E of IBPA)
- OF-296, partially completed
- Emergency Equipment Shift Ticket, OF-297
- Unit Log, ICS-214

Instructions:

1. Allow students 15 – 25 minutes to complete each scenario.
2. Read each scenario to the students. Answer any questions the students may have.
3. Provide specific information to students to complete forms.
4. At the end of the scenario select one random student for each day's scenario to outline their documentation. Ask class for additional information or information that was different.
5. Ask students if they have any questions.

## Day 1 Scenario

### Materials Needed:

- Complete IBPA
- Resource order
- OF-296, partially completed (Pre-use sections) Emergency Equipment Shift Ticket, OF-297 (blank)

### Scenario:

You are assigned as a HEQB on the West fire in the Plumas National Forest. You have been assigned a Type II excavator, equipped with a six-way dozer blade, and a bucket and thumb.

The first day of your assignment you meet up with the operator. You receive a copy of the contract from the contractor. Using the provided contract and resource order, complete the pertinent sections of the OF-296. Using the resource order, contract, and information provided below, complete an Emergency Equipment Shift Ticket, OF-297.

### Day 1

0800 – 0900

Travel to Fire

0900 – 1100

Check-In

1100 – 1800

Operational period

## Day 2 Scenario

### Materials Needed:

- Complete IBPA
- Resource order
- OF-296, partially completed (pre-sections)
- Emergency Equipment Shift Ticket, OF-297 (blank)
- General Message Form, ICS-213 (blank)
- Unit Log, ICS-214 (blank)

### Scenario:

It is now day 2 of the assignment. You have attended the briefing and completed your daily inspection. At 1000 of the operational period the equipment has a bearing failure. The operator contacts their support vehicle which breaks an axle on the way to the repair site. At this time the contractor requests the incident mechanic respond and repair the heavy equipment.

At 1400 the repairs are completed and the heavy equipment is able to complete the rest of the operational period.

Referencing the IBPA, identify the clauses, and complete the required documentation. Complete the Emergency Equipment Shift Ticket, OF-297.

### Day 2

0600 – 1000

Operational period

1000 – 1400

Equipment breakdown – Bearing on roller failed.

Support vehicle breaks an axle on the way to the repair site.

Incident Mechanic used to repair.

1400 – 1800

Operational period

### Instructor information:

D.21.3 Mechanic Repairs

D.21.8.3 Equipment down time

(Payment Clause)

(Damage Documentation)

## Day 3 Scenario

### Materials Needed:

- Complete IBPA
- Standard Contractor Performance Report (found in exhibit E of IBPA)
- OF-296, partially completed
- Emergency Equipment Shift Ticket, OF-297
- Unit Log, ICS-214

### Scenario:

It is now day 3 of the assignment. The incident is in the demobilization stage. The operator performs well while in the field but the Supply Unit Leader complained about the vendor continually trying to checkout PPE.

Complete the Emergency Equipment Shift Ticket, OF-297, Release Inspection section of the OF-296, Standard Contractor Performance Report, and Unit Log, ICS-214.

### Day 3

0600 – 1200

Operational period

1230 – 1430

Demobilization – Release Inspection,  
Performance Report

1430 – 1530

Travel





## **UNIT OVERVIEW**

**Course**      Heavy Equipment Boss, S-236

**Unit**          2 – Equipment Identification

**Time**          3 Hours

### **Objectives**

1.      Identify the various pieces of heavy equipment utilized during a wildfire, or all hazard incident, including rehabilitation and repair.
2.      Identify differences in equipment capabilities, limitations, and attachments.
3.      Discuss transportation requirements and considerations for heavy equipment.

### **Strategy**

Equipment identification are a must for any qualified HEQB: Unit 2 emphasized equipment capabilities, transportation and the role of the HEQB.

### **Instructional Methods**

- Informal lecture and discussion with PowerPoint.
- Exercises and scenarios
- Video clips

### **Instructional Aids**

- ☐    Computer with LCD projector, presentation software, and screen
- ☐    Flip chart and markers
- ☐    Flip charts/Dry Erase Board/ Dry-erase markers

### **Exercises**

- None

### **Evaluation Methods**

- Student and classroom participation.

## **Outline**

- I. Equipment Overview
- II. Heavy Equipment
- III. More Heavy Equipment
- IV. Transportation and Transports

## **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:** Heavy Equipment Boss, S-236

**Unit:** 2 – Equipment Identification

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>	Slide 2-1
<b>Present Unit Objectives.</b>	Slide 2-2
I. EQUIPMENT OVERVIEW	Slide 2-3
A. Identification	
Heavy equipment identification, knowledge of attachments, and the equipment's capabilities and limitations are a must for all Heavy Equipment Bosses (HEQB). This knowledge will allow them to utilize a piece or a package of heavy equipment safely and efficiently.	Slide 2-4
Some geographic locations may use specific heavy equipment and attachments best suited for their area. The HEQB should consult with local experience when available to best choose the right equipment for the soils and fuel model in order to accomplish the mission safely and efficiently.	Slide 2-5



OUTLINE		AIDS & CUES												
<ul style="list-style-type: none"><li>• Maneuverability</li><li>• Ground pressure</li><li>• Width</li><li>• Staging</li></ul> <div><b>TIP</b> Heavy equipment that will be used together as a package, without significant geographical separation, will often be managed by one HEQB; if you feel you are being asked to supervise too much equipment, or if it is often separated, consider asking your supervisor for a strike team or task force leader (STEQ, TFLD).</div>														
II. HEAVY EQUIPMENT		Slide 2-8												
A. Dozer		Slide 2-9												
<table><tr><th>Types</th><th>Horse Power</th><th>Examples</th></tr><tr><td>1 Heavy</td><td>200-320</td><td>D7, D8, TD20</td></tr><tr><td>2 Medium</td><td>100-199</td><td>D6, D5H, JD750</td></tr><tr><td>3 Light</td><td>50-99</td><td>D3, D4, JD550</td></tr></table>		Types	Horse Power	Examples	1 Heavy	200-320	D7, D8, TD20	2 Medium	100-199	D6, D5H, JD750	3 Light	50-99	D3, D4, JD550	
Types	Horse Power	Examples												
1 Heavy	200-320	D7, D8, TD20												
2 Medium	100-199	D6, D5H, JD750												
3 Light	50-99	D3, D4, JD550												
1. Features and Capabilities		Slide 2-10												
<ul style="list-style-type: none"><li>• Pushing soil or clearing vegetation<ul style="list-style-type: none"><li>— For fireline construction</li><li>— Road building or improvement</li></ul></li></ul>														

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Turnouts</li> <li>– Safety zones</li> <li>• Retrieving stuck or disabled equipment</li> <li>• Fireline pioneering</li> <li>• Push over hazard trees</li> <li>• Can access steeper ground than wheeled machines</li> <li>• Low ground pressure</li> </ul>	Slide 2-11
<p>2. Limitations</p> <ul style="list-style-type: none"> <li>• Maximum slope: <ul style="list-style-type: none"> <li>– 75% downhill</li> <li>– 55% uphill</li> <li>– 45% sidehill</li> </ul> </li> </ul>	Slide 2-12
<p>3. Attachments and Options</p> <ul style="list-style-type: none"> <li>• Blades <ul style="list-style-type: none"> <li>– Straight</li> </ul> <p>Often times a straight blade isn't able to be angled, requiring the dozer to turn and cast more often.</p> </li> </ul>	Slide 2-13

OUTLINE	AIDS & CUES
<p>Uses for straight blades are: pioneering, fireline and safety zone construction, and road construction and maintenance.</p> <p>– Angle (4-way, 6-way)</p> <p>Can push soil to either side of the dozer.</p> <p>Very versatile for fireline construction and an excellent choice for water barring, and other rehabilitation needs.</p> <p>Angle blades are either manually or hydraulically adjusted.</p>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Universal Blade (U blade) <p>Is tall and curved, and has large side wings to carry or push more material.</p> <p>Semi U</p> <p>Both U and semi U blades are best used for pioneering, and building fireline when followed up by an angle blade dozer. They are also a good choice for sump digging, general earth moving needs, and road building.</p> </li> <li>– Brush rake <p>A short dozer blade with added vertical bars below and/or above the blade.</p> <p>The best uses for brush blades are pioneering in brush, clearing and piling slash, mop up work, and certain rehabilitation work.</p> </li> </ul>	



OUTLINE	AIDS & CUES
<p>There are also brush racks, which can be added or removed to the top of dozer blades.</p> <p>– Shear</p> <p>Shearing blades are designed to sever tree trunks at ground level. They are fixed at an angle and have saw-like teeth along the base of the modified dozer blade for cutting.</p> <p>Used for rapid clearing of non-sprouting trees. They leave the area relatively smooth with stumps usually left intact in the ground. They are not effective in rocky ground.</p> <p>– V blade</p> <p>Best used in swampy ground as dirt is thrown to both sides in front of dozer for tracks to ride up on.</p> <p>Also good for punching through dense stands of small diameter fuels (pioneering).</p>	

OUTLINE	AIDS & CUES
<p style="text-align: center;">Are utilized in some geographical areas to “strip” undergrowth from between treed plantation rows.</p> <p style="text-align: center;">Not good in rocky ground or steep slopes.</p> <ul style="list-style-type: none"> <li>• Wide track</li> </ul> <p style="text-align: center;">These have low ground pressure (LGP), and can be up to 36” wide.</p> <ul style="list-style-type: none"> <li>• Ice grousers (square stock welded to grousers) for added traction</li> <li>• Cable winch with and without arch. Cable designed for skidding timber.</li> <li>• Winch (retrieving equipment)</li> <li>• Lights</li> <li>• Grapple</li> </ul> <p>4. Application</p> <ul style="list-style-type: none"> <li>• Pioneering</li> <li>• A cleared line down to mineral soil.</li> </ul>	<p>Slide 2-14</p> <p>Slide 2-15</p> <p>Slide 2-16</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Fuel break <ul style="list-style-type: none"> <li>– Shaded and un-shaded</li> <li>– Has no mineral soil break within it.</li> <li>– Walk down, where trees aren't removed.</li> </ul> </li> <li>• Rehabilitation</li> <li>• Hazard tree and snag mitigation</li> <li>• Building staging areas, roads, road improvement, and turnouts.</li> <li>• Safety zone construction</li> <li>• Vehicle retrieval with winch</li> </ul> <p>5. Unique Inspection Characteristics</p> <ul style="list-style-type: none"> <li>• Blade system <p>Blade anchor pins and trunion ball (manual angle blades)</p> </li> <li>• Track drive system</li> <li>• Attachments</li> </ul>	<p>Slide 2-17</p> <p>Slide 2-18</p>
<div style="border: 2px solid black; padding: 5px;">Play dozer video.</div>	<p>Slide 2-19</p>

**DOZER TIPS**

- **Winches are a valuable attachment when ordering dozers. Guideline is half of assigned dozers should have winches.**
- **Consider what type of blade is best for accomplishing the mission efficiently.**
- **In some geographical areas, you will need to consider specifying options such as wide tracks or ice grousers.**
- **While larger dozers can increase production, they also pose logistical limitations of maneuverability and transportation.**

B. Dozer – Pumper Cat

Slide 2-20

Types	Horse Power	Tank Size
1	200-320+	500+ gallons
2	100-199	325-499 gallons
3	50-99	200-324 gallons

All pumps: 30 gpm at 70 psi

1. Features and capabilities

Slide 2-21

- Water tank, pump, and live hose reel
- Fully functioning blade
- Stable, powerful, moderately fast, versatile

OUTLINE	AIDS & CUES
<p>2. Limitations</p> <ul style="list-style-type: none"> <li>• Maximum slope: <ul style="list-style-type: none"> <li>– 75% downhill</li> <li>– 55% uphill</li> <li>– 40% sidehill</li> </ul> </li> </ul>	Slide 2-22
<p>3. Attachments and options</p> <ul style="list-style-type: none"> <li>• 200 gallon to 1500 gallon tank</li> <li>• Foam unit</li> <li>• Removable tank (not always)</li> <li>• Straight or angle blade</li> </ul>	Slide 2-23
<p>4. Application</p> <ul style="list-style-type: none"> <li>• Ability to direct water placement in difficult terrain.</li> <li>• Support harvester and feller buncher operations.</li> <li>• Pioneering</li> <li>• Fireline construction</li> </ul>	Slide 2-24

OUTLINE	AIDS & CUES
<p>5. Unique Inspection Characteristics</p> <ul style="list-style-type: none"> <li>Modification system (water tank and pump)</li> <li>Blade system <ul style="list-style-type: none"> <li>Blade anchor pins and trunion ball (manual angle blades)</li> </ul> </li> <li>Track drive system</li> <li>Attachments</li> </ul>	<p>Slide 2-25</p>
<div> <p><b>DOZER – PUMPER CAT TIPS</b></p> <ul style="list-style-type: none"> <li><b>This is a good choice of equipment for supporting fuel break construction in difficult terrain.</b></li> <li><b>Good piece of equipment for Initial Attack as you have a dozer for line construction and if you are lucky (good) enough to catch the fire, and a tool to help with mop up without ordering more.</b></li> </ul> </div>	
<div> <p><b>Discussion Point</b></p> <p><b>How do you find out if heavy equipment has been modified?</b></p> <p><b>Ask the operator.</b></p> </div>	



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Swing and fixed boom grapples</li> <li>• Cable winch with and without arch</li> <li>• Lights</li> <li>• Wide track for lower ground pressure (LGP).</li> </ul>	
<p>4. Application</p> <ul style="list-style-type: none"> <li>• Drag (skid) logs off line.</li> <li>• Can perform dozer functions.</li> <li>• Sweeping away ground fuels, when skidding whole tree bundles</li> <li>• Rehabilitation and repair</li> </ul>	Slide 2-29
<p>5. Unique Inspection Characteristics</p> <ul style="list-style-type: none"> <li>• Grapple system</li> <li>• Blade system</li> </ul> <p>Blade anchor pins and trunion ball (manual angle blades)</p> <ul style="list-style-type: none"> <li>• Track drive system</li> <li>• Attachments</li> </ul>	Slide 2-30
<div style="border: 2px solid black; padding: 2px;">Play video of dozer/track skidder.</div>	Slide 2-31



**DOZER/TRACK SKIDDER TIPS:**

- **Excellent for rehabilitation due to its ability to place timber and vegetation back on the line, while building water bar.**
- **Skidders use cable winches with arch, grapples or both.**
- **There are three styles of grapple skidder booms:**
  - **Single function with two hydraulic cylinders, allowing the boom to only lower in one position.**
  - **Dual function booms have four cylinders, allowing for adjusting the boom two ways.**
  - **Swing- boom can be swung from side to side allowing spread out trees to be grabbed at once.**
- **Know your attachments.**

D. Excavator

Slide 2-32

Types	Horse Power	Rating
1	156 +	>50k lbs.
2	111-155	>32k lbs.
3	81-110	> 25k lbs.
4	60-80	> 15k lbs.

1. Features and capabilities

Slide 2-33

- 360° swing



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Brush rake</li> <li>• Blades (varying from light to heavy duty)</li> </ul> <p>New breed of machines coming from the manufacture with 6-way heavy duty blades.</p> <p>4. Application</p> <ul style="list-style-type: none"> <li>• Depending on attachments and options <ul style="list-style-type: none"> <li>– Fuel breaks</li> <li>– Rehabilitation</li> <li>– Repair of culvert and ditch drainage.</li> <li>– Precise placement of materials</li> <li>– Fireline construction</li> </ul> </li> </ul>	<p>Slide 2-37</p>
<p>5. Unique Inspection Characteristics</p> <ul style="list-style-type: none"> <li>• Boom assembly</li> <li>• Turntable</li> </ul>	<p>Slide 2-38</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>Play video of excavator on steep slope.</b></p> </div>	<p>Slide 2-39</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>Play video of excavator digging line.</b></p> </div>	<p>Slide 2-40</p>

**EXCAVATOR TIPS**

- **When ordering realize that 360 degree swing machines are not required by OSHA to have ROPs. OSHA states that the boom qualifies it as the ROP system.**
- **If excavator does not have a blade it can use a log or steel beam for dragging and grooming.**
- **Can build a corduroy system out of available logs in boggy areas, and carry it with them.**
- **In some geographical areas wide tracks can be specified when ordering, which will reduce ground pressure.**
- **Excellent for rehabilitation due to its precise ability to place timber and vegetation back on the line.**
- **Some excavators have dozer undercarriages and larger blades and can work in very steep country (<75%) utilizing their boom and blade for positioning.**
- **Type I excavators can be 55,000 to 100,000 pounds with tracks 12' wide; be sure to discuss your typing needs with your supervisor.**
  - **Useful when rehabbing large lines when a long reach is needed. Saves padding time.**
- **Thumbs are extremely useful and should be specified when ordering excavators.**
- **Excavator can go places that a dozer can't. Less soil disturbance than a dozer.**

OUTLINE		AIDS & CUES						
E.	Feller Buncher	Slide 2-41						
<table><tr><th>Types</th><th>HP</th></tr><tr><td>1</td><td>226+</td></tr><tr><td>2</td><td>160-225</td></tr></table>		Types	HP	1	226+	2	160-225	
Types	HP							
1	226+							
2	160-225							
1.	Features and capabilities	Slide 2-42						
<ul style="list-style-type: none"><li>• 360 degree swing</li><li>• Most have leveling cabs</li><li>• Cut and fell 1-3 trees per minute.</li><li>• Tracked</li><li>• Rubber tired (drive to tree)- Has no swing or reach.</li></ul>								
<div><p><b>Discussion Question:</b></p><p><b>Rubber tired feller buncher and tracked feller buncher are very different machines with specific purposes, be very clear when ordering these machines. How are they different?</b></p><p><b>Answer:</b></p><p><b>The rubber tired feller buncher is very unstable when not on flat ground.</b></p></div>								
<ul style="list-style-type: none"><li>• Cut up to 28” diameter</li><li>• Double cut up to 40” diameter</li></ul>		Slide 2-43						

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Fells one tree-stem at a time while accumulating the others.</li> <li>• Up to 28 foot reach</li> <li>• Rotational heads can cut horizontally or vertically.</li> </ul>	
<p>2. Limitations</p> <ul style="list-style-type: none"> <li>• Maximum slope: Tracked feller buncher <ul style="list-style-type: none"> <li>– 40-55% uphill and downhill</li> <li>– 30% sidehill</li> </ul> </li> <li>• Slow track speed</li> <li>• Often large and heavy</li> <li>• 300 foot minimum safety circle (360 degrees).</li> <li>• Generally this equipment is logistically complex to transport (to, from, and within incident).</li> </ul>	<p>Slide 2-44</p>
<p>3. Attachments and Options</p> <ul style="list-style-type: none"> <li>• “Hot saw” disc heads</li> <li>• Lights</li> </ul>	<p>Slide 2-45</p>

OUTLINE	AIDS & CUES
<p>4. Application</p> <ul style="list-style-type: none"> <li>• Snagging and hazard tree falling</li> <li>• Thinning along roads</li> <li>• Fuel breaks</li> </ul>	Slide 2-46
<p>5. Unique Inspection Characteristics</p> <ul style="list-style-type: none"> <li>• Leveling cabs</li> <li>• Boom and head attachments</li> <li>• Turntable</li> <li>• Complicated high pressure hydraulics</li> </ul>	Slide 2-47
<div>Play video of feller buncher.</div>	Slide 2-48
<div> <b>FELLER BUNCHER TIPS</b> <ul style="list-style-type: none"> <li>• Due to the high speed of the cutting disc, consider having a skidgine or other piece of water handling equipment available due to rock strikes and fire starting potential.</li> <li>• Most bunchers are not able to cut effectively in a horizontal position, while most harvester type heads can.</li> <li>• High stumping will significantly reduce the chance of rock strikes.</li> <li>• Disc head can be back dragged to create a narrow fireline.</li> </ul> </div>	

OUTLINE		AIDS & CUES								
F.	Skidder, Rubber Tired	Slide 2-49								
<table><tr><th>Types</th><th>Horse Power</th></tr><tr><td>1</td><td>176+</td></tr><tr><td>2</td><td>100-175</td></tr><tr><td>3</td><td>60-99</td></tr></table>		Types	Horse Power	1	176+	2	100-175	3	60-99	
Types	Horse Power									
1	176+									
2	100-175									
3	60-99									
1.	Features and capabilities	Slide 2-50								
<ul style="list-style-type: none"><li>• Low ground pressure</li><li>• Light duty blade</li><li>• Articulated, for tight stands or narrow trails</li><li>• Quicker travel speed than tracked machine.</li></ul>										
2.	Limitations	Slide 2-51								
<ul style="list-style-type: none"><li>• Maximum slope:<ul style="list-style-type: none"><li>– 30-45% uphill and downhill, depending on soils</li><li>– 22% sidehill</li></ul></li></ul>										
3.	Attachments and Options	Slide 2-52								
<ul style="list-style-type: none"><li>• Cable winch, with arch and chokers</li><li>• Grapple, fixed or swing boom</li><li>• Both cable and grapple</li></ul>										



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Lights</li> <li>• Chains</li> </ul> <p>4. Application</p> <ul style="list-style-type: none"> <li>• Drag (skid) logs off line</li> <li>• Sweeping away ground fuels, when skidding whole tree bundles</li> <li>• Clear dead and down from line</li> <li>• Build fireline in a pinch</li> <li>• Break up jackpots of fuel during mop up</li> </ul> <p>5. Unique Inspection Characteristics</p> <ul style="list-style-type: none"> <li>• Grapple system</li> <li>• Winch, if equipped</li> <li>• Articulation points</li> </ul>	<p>Slide 2-53</p> <p>Slide 2-54</p>
<div style="border: 2px solid black; padding: 5px;"> <b>Play video of skidder, rubber tired</b> </div>	<p>Slide 2-55</p>

OUTLINE	AIDS & CUES
<div data-bbox="217 289 787 331" data-label="Section-Header"> <p><b>SKIDDER, RUBBER TIRED TIPS</b></p> </div> <div data-bbox="217 348 1036 1312" data-label="List-Group"> <ul style="list-style-type: none"> <li>• <b>Cable winch for log retrieval.</b></li> <li>• <b>Cable requires operator to leave cab, or have a second person as setter.</b></li> <li>• <b>Depending on terrain consider chains when ordering.</b></li> <li>• <b>Consider a grapple skidder paired with a mechanized feller to get bundled stems off the line.</b></li> <li>• <b>Consider the distance required to skid bundles; you may need to order an additional skidder to keep pace with felling operations.</b></li> <li>• <b>Rubber tired skidders can be more stable on rock than track machines.</b></li> <li>• <b>The high ground speed of rubber tired skidders allows them to cover large distances on an incident without the need for a transport.</b></li> <li>• <b>Chains can significantly improve off-road capabilities.</b></li> </ul> </div>	

OUTLINE		AIDS & CUES																				
<p>G. Skidgine, Rubber Tired</p> <p>Skidgines are converted skidders with either fixed or removable tank and pump systems.</p> <table><tr><th>Types</th><th>Horse Power</th><th>Pump</th><th>Tank Size in gallons</th></tr><tr><td>1</td><td>176+</td><td>30 gpm @ 70 psi</td><td>1200+</td></tr><tr><td>2</td><td>75-175</td><td>30 gpm @ 70 psi</td><td>800-1199</td></tr><tr><td>3</td><td>100+</td><td>30 gpm @ 70 psi</td><td>400-799</td></tr><tr><td>4</td><td>69-99</td><td>30 gpm @ 70 psi</td><td>200-399</td></tr></table> <p>1. Features and capabilities</p> <ul style="list-style-type: none"><li>• Low ground pressure</li><li>• Light duty blade</li><li>• Articulated, for tight stands or narrow trails</li><li>• Quicker travel speed than tracked machine.</li><li>• Water tank and pump system</li></ul>		Types	Horse Power	Pump	Tank Size in gallons	1	176+	30 gpm @ 70 psi	1200+	2	75-175	30 gpm @ 70 psi	800-1199	3	100+	30 gpm @ 70 psi	400-799	4	69-99	30 gpm @ 70 psi	200-399	<p>Slide 2-56</p> <p>Slide 2-57</p>
Types	Horse Power	Pump	Tank Size in gallons																			
1	176+	30 gpm @ 70 psi	1200+																			
2	75-175	30 gpm @ 70 psi	800-1199																			
3	100+	30 gpm @ 70 psi	400-799																			
4	69-99	30 gpm @ 70 psi	200-399																			

OUTLINE	AIDS & CUES
<p>2. Limitations</p> <ul style="list-style-type: none"> <li>• Maximum slope: <ul style="list-style-type: none"> <li>– 30-45% uphill and downhill, depending on soils</li> <li>– 22% sidehill</li> <li>– Water pump is relatively small</li> </ul> </li> <li>• Water tank</li> </ul>	Slide 2-58
<p>3. Attachments and options</p> <ul style="list-style-type: none"> <li>• Some skidgines can drop the water system and be used as a skidder.</li> <li>• Water cannon</li> <li>• Foam</li> <li>• Modified blade</li> <li>• Lights</li> <li>• Chains</li> </ul>	Slide 2-59
<p>4. Application</p> <ul style="list-style-type: none"> <li>• Support for mechanized felling operations.</li> <li>• Support for off-road suppression or mop up.</li> </ul>	Slide 2-60

OUTLINE		AIDS & CUES								
5.	Unique inspection characteristics <ul style="list-style-type: none"><li>Water and pump system</li><li>Articulation points</li></ul>	Slide 2-61								
<div>Play video of skidgine, rubber tired.</div>		Slide 2-62								
<div>SKIDGINE, RUBBER TIRED TIPS<ul style="list-style-type: none"><li>Chains can significantly improve off-road capabilities.</li><li>Ordering a removable water system will give you dual capabilities of an off-road engine platform or a skidder.</li><li>This equipment is highly customized by individuals and there are a variety of options and capabilities within each type.</li></ul></div>										
H.	Skidgine Soft Track <table><tr><th>Type</th><th>Horse Power</th><th>Pump</th><th>Tank Size</th></tr><tr><td>1</td><td>170+</td><td>30 gpm @ 70 psi</td><td>600+ gl.</td></tr></table>	Type	Horse Power	Pump	Tank Size	1	170+	30 gpm @ 70 psi	600+ gl.	Slide 2-63
Type	Horse Power	Pump	Tank Size							
1	170+	30 gpm @ 70 psi	600+ gl.							
1.	Features and capabilities <ul style="list-style-type: none"><li>Can work in steeper ground than rubber tired equipment.</li><li>Performs better in some soils when compared to rubber tired.</li><li>Higher track speeds than hard tracked equipment.</li></ul>	Slide 2-64								

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Light duty blade</li> </ul> <p>2. Limitations</p> <ul style="list-style-type: none"> <li>• 60% uphill and downhill</li> <li>• 35-40% sidehill</li> </ul> <p>3. Attachments and options</p> <ul style="list-style-type: none"> <li>• Foam</li> <li>• Water cannon</li> <li>• Modified blade</li> </ul> <p>4. Application</p> <ul style="list-style-type: none"> <li>• Support for mechanized felling operations.</li> <li>• Support for off-road suppression or mop up.</li> </ul> <p>5. Unique inspection characteristics</p> <ul style="list-style-type: none"> <li>• Soft track system</li> <li>• Tank and pump system</li> </ul>	<p>Slide 2-65</p> <p>Slide 2-66</p> <p>Slide 2-67</p> <p>Slide 2-68</p>
<div style="border: 2px solid black; padding: 5px;"> <b>Play video of skidgine, soft track.</b> </div>	<p>Slide 2-69</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>SKIDGINE SOFT TRACK TIP</b></p> <p><b>This equipment is highly customized by individuals and there are a variety of options and capabilities within each type</b></p> </div>	

OUTLINE		AIDS & CUES						
I.	Tractor Plow (Types 2-3)	Slide 2-70						
<table><tr><th>Types</th><th>Horse Power</th></tr><tr><td>2</td><td>100-199</td></tr><tr><td>3</td><td>50-99</td></tr></table>		Types	Horse Power	2	100-199	3	50-99	
Types	Horse Power							
2	100-199							
3	50-99							
1.	Features and capabilities	Slide 2-71						
<ul style="list-style-type: none"><li>• Plow is pulled to create fireline.</li><li>• Pushing soil or clearing vegetation with blade is secondary.</li><li>• Creates a fireline down to mineral soil faster than blading alone, in some soil types.</li><li>• Retrieving stuck or disabled equipment.</li><li>• Fireline pioneering.</li><li>• Pushing over snags.</li><li>• Low ground pressure.</li></ul>								
2.	Limitations	Slide 2-72						
<ul style="list-style-type: none"><li>• Not used in steep terrain.</li><li>• Rocky soil</li><li>• Maneuvering can be a factor in pull behind plows.</li></ul>								





OUTLINE	AIDS & CUES								
<ul style="list-style-type: none"> <li>• Pioneering</li> </ul> <p>5. Unique Inspection Characteristics</p> <ul style="list-style-type: none"> <li>• Plow (stinger or pull behind)</li> <li>• Blade system</li> </ul> <div style="border: 2px solid black; padding: 10px; margin-top: 10px;"> <p><b>TRACTOR PLOW TIPS</b></p> <ul style="list-style-type: none"> <li>• <b>Excellent for fireline construction in many geographical areas.</b></li> <li>• <b>Winches are a valuable attachment when ordering tractor plows.</b></li> </ul> </div>	<p>Slide 2-75</p>								
<p>J. Grader</p> <table border="1" data-bbox="396 1031 800 1207"> <thead> <tr> <th>Types</th><th>Horse Power</th></tr> </thead> <tbody> <tr> <td>1</td><td>201+</td></tr> <tr> <td>2</td><td>126-200</td></tr> <tr> <td>3</td><td>&lt;125</td></tr> </tbody> </table> <p>1. Features and capabilities</p> <ul style="list-style-type: none"> <li>• Road maintenance</li> <li>• Fireline construction in flashy fuels</li> <li>• Road shoulder vegetation treatment</li> <li>• Recontour road surface</li> </ul>	Types	Horse Power	1	201+	2	126-200	3	<125	<p>Slide 2-76</p> <p>Slide 2-77</p>
Types	Horse Power								
1	201+								
2	126-200								
3	<125								

OUTLINE	AIDS & CUES
<p>2. Limitations</p> <ul style="list-style-type: none"> <li>• Maximum slope: <ul style="list-style-type: none"> <li>– 45% uphill and downhill</li> <li>– 15% sidehill</li> </ul> </li> <li>• Approach and departure angles can be a factor due to long wheel base and attachments.</li> </ul>	Slide 2-78
<p>3. Attachments and options</p> <ul style="list-style-type: none"> <li>• Articulating chassis</li> <li>• 14 feet moldboards</li> <li>• Slopeboard</li> <li>• Rippers</li> <li>• Scarifier</li> <li>• Chains</li> <li>• Lights</li> </ul>	Slide 2-79
<p>4. Application</p> <ul style="list-style-type: none"> <li>• Grass vegetation</li> <li>• Existing roads</li> </ul>	Slide 2-80

OUTLINE		AIDS & CUES												
<div>5. Unique inspection characteristics<ul style="list-style-type: none"><li>Bull wheel, or circle assembly</li><li>Trunion ball</li></ul></div> <div><div>GRADER TIPS<ul style="list-style-type: none"><li>Higher operating speeds than tracked-blade equipment.</li><li>Useful for rehabilitation.</li><li>Grader operator’s experience may be in road and not in wildfire.</li></ul></div></div>		Slide 2-81												
III. MORE HEAVY EQUIPMENT		Slide 2-82												
A. Forwarder		Slide 2-83												
<table><tr><th>Types</th><th>Horse Power</th><th>Pump</th><th>Tank (minimum)</th></tr><tr><td>1</td><td>176+</td><td>50 gpm @ 100 psi</td><td>1200 gallons</td></tr><tr><td>2</td><td>75-175</td><td>50 gpm @ 100 psi</td><td>800 gallons</td></tr></table>		Types	Horse Power	Pump	Tank (minimum)	1	176+	50 gpm @ 100 psi	1200 gallons	2	75-175	50 gpm @ 100 psi	800 gallons	
Types	Horse Power	Pump	Tank (minimum)											
1	176+	50 gpm @ 100 psi	1200 gallons											
2	75-175	50 gpm @ 100 psi	800 gallons											
<div>1. Features and capabilities<ul style="list-style-type: none"><li>Log moving</li><li>Self-load and un-load timber</li><li>4/6/8 wheel configurations</li><li>8–20 ton hauling capacity</li><li>12 mph–15 mph unloaded</li><li>Rubber tires</li></ul></div>		Slide 2-84												



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Chains or tire bands</li> <li>• Lights</li> </ul> <p>4. Application and options</p> <ul style="list-style-type: none"> <li>• Multiple capabilities depending upon attachments.</li> <li>• Can be configured as a Type I skidgine.</li> <li>• Can load and transport timber and slash.</li> </ul> <p>5. Unique inspection characteristics</p> <ul style="list-style-type: none"> <li>• Boom assembly</li> <li>• Drive wheel assembly</li> <li>• Log bunk and tank securement</li> </ul>	<p>Slide 2-88</p> <p>Slide 2-89</p>
<div style="border: 2px solid black; padding: 5px;">Play video of forwarder</div>	<p>Slide 2-90</p>
<div style="border: 2px solid black; padding: 10px;"> <p><b>FORWARDER TIPS</b></p> <ul style="list-style-type: none"> <li>• Can be a very versatile piece of equipment, depending upon attachments.</li> <li>• This is a wide piece of equipment. Best used after a fireline or fuel break has been established.</li> </ul> </div>	

OUTLINE	AIDS & CUES
<p data-bbox="298 281 542 317">B. Harvester</p> <p data-bbox="394 365 1040 491">Harvesters are generally negotiated under a separate agreement, and aren't nationally typed.</p> <p data-bbox="394 533 857 575">1. Features and capabilities</p> <ul data-bbox="492 617 1024 1730" style="list-style-type: none"> <li data-bbox="492 617 846 659">• 360 degree swing</li> <li data-bbox="492 701 987 785">• Track machines often have leveling cab.</li> <li data-bbox="492 827 997 911">• Boom mounted bar saw cutting heads (dangle head)</li> <li data-bbox="492 953 997 995">• Fell, delimb, and buck trees</li> <li data-bbox="492 1037 927 1079">• Cut one stem at a time.</li> <li data-bbox="492 1121 1003 1205">• Bar chain moves only when activated.</li> <li data-bbox="492 1247 1003 1331">• Harvester heads lighter than feller buncher.</li> <li data-bbox="492 1373 927 1457">• Vertical and horizontal positions for cutting.</li> <li data-bbox="492 1499 906 1583">• Useful for downed or jack-strawed timber</li> <li data-bbox="492 1625 1024 1709">• Some booms can reach as far as 32 feet.</li> </ul>	<p data-bbox="1078 281 1230 317">Slide 2-91</p> <p data-bbox="1078 533 1235 569">Slide 2-92</p> <p data-bbox="1078 1121 1235 1157">Slide 2-93</p>

OUTLINE	AIDS & CUES
<p>2. Limitations</p> <ul style="list-style-type: none"> <li>Maximum slope: 35-55% uphill and downhill (depending on track configuration)</li> <li>Newest machines can operate up and downslope of 80%</li> <li>Rubber tire mounted – &lt;40% up and downhill slope</li> <li>Slow track speeds</li> </ul>	Slide 2-94
<p>3. Attachments and options</p> <ul style="list-style-type: none"> <li>Track or rubber tire mounted</li> <li>Fixed or dangle head</li> <li>Harvester head (different diameter)</li> <li>Bar-saw</li> <li>Chains or track bands</li> <li>Lights</li> </ul>	Slide 2-95
<p>4. Application</p> <ul style="list-style-type: none"> <li>Directional felling of trees.</li> <li>Lifting and bucking of downed timber.</li> </ul>	Slide 2-96

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Can be used as a processor after line construction and leave green material in the fuel break as a slash mat.</li> <li>• Useful for wet areas to place logs as a corduroy.</li> </ul> <p>5. Unique inspection characteristics</p> <ul style="list-style-type: none"> <li>• Head attachment area</li> <li>• Leveling cab</li> <li>• Complicated high pressure hydraulic system</li> </ul>	<p>Slide 2-97</p>
<div>Play videos of a harvester.</div>	<p>Slide 2-98 Slide 2-99</p>
<div> <p><b>Discussion Question:</b></p> <p><b>Discuss with the students the main capability differences between utilizing a harvester or a feller-buncher (e.g., cut-to-length, delimb, ability to place cut fuels, cutting head mobility etc.).</b></p> </div>	
<div> <p><b>HARVESTER TIPS</b></p> <ul style="list-style-type: none"> <li>• <b>Rotate 360°, consider safety circle</b></li> <li>• <b>Generally this equipment is logistically complex to transport (to, from, and within incident)</b></li> </ul> </div>	



OUTLINE		AIDS & CUES																
C.	<p>Skidgine, Hard Track</p> <p>A smaller piece of equipment converted from snow cat style cab/chassis. Used in marshy areas.</p>	Slide 2-100																
D.	<p>Chipper</p> <p>Chippers can be used behind a thinning crew and can be assigned to a nearby HEQB.</p> <table><tr><th>Types</th><th>Horse Power</th><th>Minimum Capacity</th></tr><tr><td>1</td><td>180+</td><td>18+ inches</td></tr><tr><td>2</td><td>110-179</td><td>13-17 inches</td></tr><tr><td>3</td><td>48-109</td><td>9-12 inches</td></tr></table> <div><b>Play video of a chipper.</b></div>	Types	Horse Power	Minimum Capacity	1	180+	18+ inches	2	110-179	13-17 inches	3	48-109	9-12 inches	Slide 2-101				
Types	Horse Power	Minimum Capacity																
1	180+	18+ inches																
2	110-179	13-17 inches																
3	48-109	9-12 inches																
		Slide 2-102																
E.	<p>Mulchers (Masticators)</p> <p>Mulchers (masticators) can be utilized in a thinning project for fuel breaks. They are best used in conjunction with a felling operation.</p> <table><tr><th>Types</th><th>Horse Power</th><th>Hydraulic Flow</th><th>Carrier Weight</th></tr><tr><td>1</td><td>156+</td><td>60+ gpm</td><td>50,000+</td></tr><tr><td>2</td><td>111-155</td><td>38-59 gpm</td><td>32,000-49,999</td></tr><tr><td>3</td><td>80-110</td><td>24-37 gpm</td><td>24,000-31,999</td></tr></table>	Types	Horse Power	Hydraulic Flow	Carrier Weight	1	156+	60+ gpm	50,000+	2	111-155	38-59 gpm	32,000-49,999	3	80-110	24-37 gpm	24,000-31,999	Slide 2-103
Types	Horse Power	Hydraulic Flow	Carrier Weight															
1	156+	60+ gpm	50,000+															
2	111-155	38-59 gpm	32,000-49,999															
3	80-110	24-37 gpm	24,000-31,999															



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Can be put on a non-boomed machine.</li> <li>– Can mulch large trees very slowly.</li> </ul> <p>Horizontal shaft head:</p> <ul style="list-style-type: none"> <li>– Resembles a barrel drum with mulching teeth attached.</li> <li>– Teeth rotate around a horizontal shaft.</li> <li>– Typically mounted on the front-end of a tracked or wheeled machine.</li> <li>– Often has a push bar to keep severed trees away from the machine.</li> </ul>	Slide 2-107
<p>2. Limitations</p> <ul style="list-style-type: none"> <li>• Slow track speeds</li> <li>• Can grind big trees, but very slowly</li> </ul>	Slide 2-108
<p>3. Attachments and options</p> <ul style="list-style-type: none"> <li>• Track or rubber tire mounted</li> <li>• Wheeled and non-boomed</li> <li>• Tracked and boomed</li> </ul>	Slide 2-109

OUTLINE	AIDS & CUES
<p>4. Application</p> <ul style="list-style-type: none"> <li>• Heavy Equipment drives over trees in order for the mulching head to grind them up.</li> <li>• Can also drive up to a tree and grind from the top down.</li> </ul> <p>5. Unique inspection characteristics</p> <ul style="list-style-type: none"> <li>• Mulching teeth</li> <li>• Pivot cutting knives</li> </ul>	<p>Slide 2-110 Slide 2-111</p> <p>Slide 2-112</p>
<div data-bbox="207 926 1052 982" style="border: 2px solid black; padding: 2px;"><b>Play video of pivot cutting knives</b></div> <ul style="list-style-type: none"> <li>• Hydraulics</li> </ul>	
<div data-bbox="207 1136 1052 1192" style="border: 2px solid black; padding: 2px;"><b>Play video of mulcher.</b></div>	<p>Slide 2-113</p>

OUTLINE	AIDS & CUES								
IV. TRANSPORTATION AND TRANSPORTS	Slide 2-114								
<table border="1"> <thead> <tr> <th>Types</th><th>Rating</th></tr> </thead> <tbody> <tr> <td>I</td><td>70k + lbs.</td></tr> <tr> <td>II</td><td>35k-70k lbs.</td></tr> <tr> <td>III</td><td>&lt;35k lbs.</td></tr> </tbody> </table>	Types	Rating	I	70k + lbs.	II	35k-70k lbs.	III	<35k lbs.	Slide 2-115
Types	Rating								
I	70k + lbs.								
II	35k-70k lbs.								
III	<35k lbs.								
<p>Larger pieces of Heavy Equipment may be more difficult to move around the fire logistically.</p>	Slide 2-116								
<p>Transportation needs must be calculated along with the Heavy Equipment's work capacity in order to make a final decision.</p>									
<p>A transport can be a tractor with fifth wheel trailer, which comes in a number of configurations (semi), or a truck with mounted flatbed which tilts to the ground. Dump trucks also utilize pull behind trailers which generally tilt.</p>	Slide 2-117								
<p>A lowboy is a semi-trailer with a drop in deck height between gooseneck and rear axles. This allows the deck to be extremely low compared with other trailers. It offers the ability to carry legal loads up to 12 feet (3.66 m) tall, which other trailers cannot.</p>									
<p>A. Limitations</p> <ul style="list-style-type: none"> <li>Roads with loose sandy soils require higher operating speeds or may be inaccessible.</li> <li>Steep slopes and tight turns may require a shorter coupled transport or may not be usable by transports.</li> </ul>	Slide 2-118								





OUTLINE	AIDS & CUES
<div data-bbox="207 283 1052 873"> <p><b>TIPS</b></p> <ul style="list-style-type: none"> <li>• <b>Some transport drivers will be uncomfortable in the back woods and or the fire environment.</b></li> <li>• <b>Proof out new routes with drivers in a pickup before committing.</b></li> <li>• <b>Discuss with transport driver their experience in off road heavy haul.</b></li> <li>• <b>If a transport is left in a staging area on an active fire, remember that they may be relying on you as their eyes and ears to keep them safe.</b></li> </ul> </div> <div data-bbox="207 940 1052 993"> <p><b>Review unit objectives.</b></p> </div>	<p>Slide 2-125</p>



## **UNIT OVERVIEW**

**Course**      Heavy Equipment Boss, S-236

**Unit**          3A – Equipment Inspection

**Time**          2 Hours

### **Objectives**

1. Discuss the field inspection process the heavy equipment boss is responsible for performing.
2. Identify specific information the heavy equipment boss should obtain from the operator before beginning work.

### **Strategy**

This unit informs the HEQB on the process of field inspection, and their role in obtaining crucial information from the Heavy Equipment operator. It is the HEQB's responsibility to ensure information is correct and that problems are mitigated before equipment is engaged on the line.

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

- Informal classroom lecture
- Interactive group discussion
- Video clips
- Exercises and Scenarios

### **Instructional Aids**

- ☐ Flip chart/Dry Erase Board/ Dry erase markers
- ☐ Personal computer with LCD projector and presentation software

### **Exercise(s)**

- None

### **Evaluation Method(s)**

- Student and classroom participation.

## **Outline**

- I.     Inspections and Forms
- II.    Day in the Life of a HEQB

## **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:** Heavy Equipment Boss, S-236

**Unit:** 3A – Equipment Inspection

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>	Slide 3A-1
<b>Present Unit Objectives.</b>	Slide 3A-2
I. INSPECTIONS AND FORMS	Slide 3A-3
<p>This section discusses pre-use and daily inspections. A pre-use inspection is usually performed by the Ground Support Unit when the equipment is checked into the incident. The daily inspection is performed by the Heavy Equipment Boss (HEQB) each day before the equipment begins its assignment.</p> <p>On Type I and II incidents, check with the Ground Support Unit to ensure the pre-use inspection was completed on the assigned equipment. If it was not completed, work with Ground Support to complete this inspection prior to beginning your assignment.</p> <p>For initial attack and some Type III incidents the HEQB may have to perform the pre-use inspection.</p>	Slide 3A-4

OUTLINE	AIDS & CUES
<p>A. Forms</p> <p>The standard heavy equipment inspection form is the Vehicle/Heavy Equipment Inspection Checklist (OF-296). Different regions or states may have their own form that they require for inspection. It is advised to check with the local agency to ensure that you are using the correct form.</p> <p>The S-236, HEQB Daily Inspection Checklist or equivalent is used for the start of shift safety inspection on an incident.</p> <p>B. OF-296, Vehicle/Heavy Equipment Inspection Checklist</p> <p>The OF-296 is used for pre-use inspection and release inspection.</p> <p>This form is divided into-3 sections.</p> <ul style="list-style-type: none"> <li>• Section I – Tractor, Motor-Grader</li> <li>• Section II –Remarks</li> <li>• Section III — Power Saw and Pump</li> </ul> <p>1. Blocks 1-9</p> <p>Inspector may not be able to complete all blocks if the equipment assigned is being used for initial attack, and it is not under an agreement. Complete block numbers 1-9 as much as possible, and contact the Contracting Officer as soon as possible.</p>	<p>Slide 3A-5</p> <p>Slide 3A-6</p> <p>Slide 3A-7</p> <p>Slide 3A-8</p>



OUTLINE	AIDS & CUES
<p>c. If accepted, the Vendor and Inspector must sign, print name, and provide a telephone number. Additionally, the "ACCEPTED" (block #10) must be checked. If not accepted check "REJECTED" and keep a copy for future reference.</p> <p>d. "Finance Copy - Pre-Use", is sent as soon as possible to the Finance Section.</p> <p>e. "Vendor Copy – Pre-Use/Release", is given to Vendor with instruction to bring the copy back for the release inspection.</p> <p>f. "Finance Copy - Release", and "Inspector - Pre-Use/Release", are kept with the inspector and the contractor.</p>	<p>Slide 3A-12</p> <p>Slide 3A-13</p>
<div data-bbox="207 1354 1052 1495" style="border: 2px solid black; padding: 5px;"> <p><b>The OF-296 may come from the cache with color copies but will still have the labeling, e.g., Finance Copy.</b></p> </div>	

OUTLINE	AIDS & CUES
<p>2. Release Inspection</p> <p>If vendor chooses to check No Damage/No Claim box, then a release inspection is not required.</p> <p>a. Retrieve "Vendor Copy" and place between the "Finance Copy - Release" and "Inspector - Pre-use/Release" copies that were held by the Inspector.</p> <p>b. Inspector completes vehicle/equipment inspection checking all items as indicated in the "Release" column of the applicable Section and Remarks if needed, If applicable</p> <p>c. Release Inspection must be completed by both Vendor and Inspector. Inspectors need to print and Vendors need to sign their names.</p> <p>d. Inspector returns "Vendor Copy" to Vendor and as soon as possible sends "Finance Copy - Release" to the Finance Section.</p>	<p>Slide 3A-14</p> <p>Slide 3A-15</p> <p>Slide 3A-16</p> <p>Slide 3A-17</p> <p>Slide 3A-18</p>

OUTLINE	AIDS & CUES
<p>e. At conclusion of a Type I or II incident the Finance Section will include copies of the inspection documentation with their close-out package to the hosting unit. For an initial attack or Type III incident check with the hosting agency for collection of Inspection documentation.</p>	<p>Slide 3A-19</p>
<p>C. S-236, HEQB Daily Inspection Checklist (or equivalent)</p> <ol style="list-style-type: none"> <li>1. Complete upper section each day with applicable information and note any changes in operator or equipment in general observation section.</li> <li>2. If equipment is in serviceable condition it should be checked as acceptable.</li> <li>3. If equipment is damaged or unserviceable the not acceptable block should be checked, and proper procedures should be followed as specified in the contract. Equipment should be placed in out-of-service status until corrective action has been taken.</li> </ol>	<p>Slide 3A-20</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>Expand on each of the categories and add examples of situations that you may have encountered on an incident.</b></p> </div>	



OUTLINE	AIDS & CUES
<p>4. Operator Safety</p> <ul style="list-style-type: none"> <li>• Annual Fireline Safety Refresher (RT-130)</li> <li>• New generation fire shelter</li> <li>• PPE: Nomex clothing, leather gloves, leather boots, approved hard hat, eye and hearing protection, flashlight, etc.</li> <li>• Seat belts (serviceable)</li> </ul>	<p>Slide 3A-21</p>
<p>5. Engine</p> <ul style="list-style-type: none"> <li>• Oil levels</li> <li>• Belts and hoses</li> <li>• Fuel leaks</li> <li>• Cooling system (no leaks and clean)</li> <li>• Spark arrester (if equipped)</li> </ul>	<p>Slide 3A-22</p> <p>Slide 3A-23</p> <p>Slide 3A-24</p> <p>Slide 3A-25</p> <p>Slide 3A-26</p>
<p>6. Hydraulics</p> <ul style="list-style-type: none"> <li>• No leaks</li> <li>• All cylinders extend and retract fully</li> <li>• Hoses (serviceable)</li> </ul>	<p>Slide 3A-27</p> <p>Slide 3A-28</p> <p>Slide 3A-29</p>

OUTLINE	AIDS & CUES
<p>7. Electrical</p> <ul style="list-style-type: none"> <li>• Forward lights</li> <li>• Work lights</li> <li>• Reverse lights</li> <li>• Backup or travel alarm</li> <li>• Battery secured and not corroded</li> </ul> <p>8. Overall condition of equipment</p> <ul style="list-style-type: none"> <li>• Windows (no cracks or breaks, good visibility)</li> <li>• Undercarriage (no broken pads, rollers in serviceable condition)</li> <li>• No cracks, broken welds, missing hardware or guards, etc.</li> <li>• Tires (no cracks or cuts to cord)</li> <li>• Tracks</li> <li>• Cutting edges (serviceable)</li> <li>• Engine compartment (e.g., belly pan), free of flammable materials</li> <li>• Fire extinguisher (secure)</li> </ul>	<p>Slide 3A-30</p> <p>Slide 3A-31</p> <p>Slide 3A-32</p> <p>Slide 3A-33</p> <p>Slide 3A-34</p> <p>Slide 3A-35</p> <p>Slide 3A-36</p> <p>Slide 3A-37</p> <p>Slide 3A-38</p> <p>Slide 3A-39</p> <p>Slide 3A-40</p>

OUTLINE	AIDS & CUES
<p>II. DAY IN THE LIFE OF A HEQB</p> <p>A. Arrival at the Incident</p> <p>After checking in, if possible meet with the Operations Section Chief or line supervisor.</p> <p>Information and opportunities gained at this meeting should include:</p> <ul style="list-style-type: none"> <li>• Leader's intent</li> <li>• Coordination of assignments</li> <li>• Sharing information</li> <li>• Priorities</li> <li>• Local hazards</li> <li>• Environmental concerns</li> </ul> <p>Types of questions to ask:</p> <ul style="list-style-type: none"> <li>• Who is your supervisor?</li> <li>• How do you get there (maps)?</li> <li>• Where is the equipment?</li> <li>• Communication plan</li> <li>• Copy of the incident action plan (IAP) if available.</li> </ul>	<p>Slide 3A-41</p> <p>Slide 3A-42</p> <p>Slide 3A-43</p> <p>Slide 3A-44</p>

OUTLINE	AIDS & CUES
<p>B. Operational Topics</p> <p>Your supervisor may be the Incident Commander, Operations Section Chief, Division Supervisor, or Strike Team/Task Force Leader.</p> <ul style="list-style-type: none"> <li>Attend the operational briefing.</li> <li>When the heavy equipment operator is available, ensure they attend the operational and division breakout briefing.</li> <li>Ask your supervisor if the transport is to remain on the line or return to staging.</li> </ul>	<p>Slide 3A-45</p> <p>Slide 3A-46</p> <p>Slide 3A-47</p>
<div data-bbox="207 1056 1052 1455" style="border: 2px solid black; padding: 10px;"> <p><b>Discussion Point</b>  <b>Ask students what do they see when they look at the slide. The slide shows a water tender transporting a dozer.</b></p> <ul style="list-style-type: none"> <li><b>Is the tender the dozers permanent transport?</b></li> <li><b>What happens if the tender leaves? How will the dozer be transported around the fire?</b></li> </ul> </div> <p>If transport is to remain on the line, discuss with your supervisor who is to assume supervision, and responsibility of the transport.</p> <ul style="list-style-type: none"> <li>Conduct operator interview and daily inspection of equipment (verify if there is a transport driver).</li> </ul>	<p>Slide 3A-48</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li data-bbox="396 281 1040 407">• Brief equipment operator on mission specifics, hazards, local concerns, and give a view of the big picture.</li> <li data-bbox="396 451 1015 577">• Ensure communication is clear and understood, e.g., radio, hand, flagging, and other signals.</li> <li data-bbox="396 621 1040 789">• Ensure operator is ready for the assignment, PPE, adequate drinking water, lunch, and any other logistical needs.</li> <li data-bbox="396 833 998 1001">• Verify transport is capable of delivering equipment to the assignment, e.g., load restrictions, bridges, road access, etc.</li> <li data-bbox="396 1045 1024 1171">• After you arrive at your assignment consider logistics of loading, unloading, and staging.</li> <li data-bbox="396 1215 1024 1341">• After unloading equipment, ensure equipment operator understands the assignment.</li> <li data-bbox="396 1386 1015 1554">• Work closely with adjoining forces to ensure safe distances and operations are maintained from the equipment.</li> <li data-bbox="396 1598 1008 1724">• Periodically, evaluate production rates and relay information to your supervisor.</li> </ul>	<p data-bbox="1081 281 1260 317">Slide 3A-49</p> <p data-bbox="1081 621 1260 657">Slide 3A-50</p> <p data-bbox="1081 833 1260 869">Slide 3A-51</p> <p data-bbox="1081 1386 1260 1421">Slide 3A-52</p>











OUTLINE	AIDS & CUES
<p data-bbox="394 283 1052 363">Attend morning briefing, and take notes to be used for the equipment operator briefing.</p> <div data-bbox="207 411 1055 470" style="border: 2px solid black; padding: 2px;"> <p data-bbox="224 422 587 459"><b>Review unit objectives.</b></p> </div>	<p data-bbox="1081 411 1260 447">Slide 3A-63</p>

## **UNIT OVERVIEW**

**Course**      Heavy Equipment Boss, S-236

**Unit**          3B – Optional Field Exercise

**Time**          4 Hours

### **Objectives**

Given a set of guidelines, students will correctly perform the following tasks in a field exercise:

1.      Observe loading and unloading.
2.      Pre-use inspection.
3.      Daily walk-around check.

### **Strategy**

Unit 3B provides the student with a hands-on application of the material presented in class and online. The student will do an inspection of provided equipment and be able to ask questions in a mentoring field environment. There may also be demonstrations of equipment capabilities if logistically feasible.

### **Instructional Method**

- This will be an instructor led field exercise with inspection areas set up in advance. The students will perform walk-around inspections of equipment and perform basic field duties under the tutelage of a cadre member.

### **Instructional Aids**

- ☐ Suggest one dozer with operator per 10 students.
- ☐ Mechanic on hand if possible.
- ☐ Field Evaluation forms (one per student for cadre to fill-out)
- ☐ Clipboards
- ☐ Pens
- ☐ Coveralls
- ☐ Gloves and other proper PPE
- ☐ OF-296 forms (one for each student)
- ☐ Inspection schematic form (one for each student)

### **Evaluation Methods**

- Complete walk-around with inspection schematic (one per student).
- OF-296 forms
- Student will be evaluated on: participation, pertinent questions asked and general capacity to perform a field inspection using correct forms and dialogue.

## **Heavy Equipment Boss, S-236**

### **Field Exercise**

Instructions for conducting the field exercise:

1. The field exercise will take approximately four hours to complete.
2. Equipment and materials needed:
  - Suggest one piece of heavy equipment with operator per ten students
  - Mechanic on hand if possible
  - HEQB Daily inspection checklist form (page 3B.9)
  - Clipboards and pens
  - Coveralls/gloves

## **Field Inspection Guidelines**

The instructors will arrange for several pieces of heavy equipment to be available for you to inspect.

You will be divided into groups, one group per available heavy equipment station. The groups will rotate from station to station to inspect the equipment.

- At each inspection station, the heavy equipment operator or mechanic will conduct an inspection using the OF-296, Vehicle/Heavy Equipment Checklist (or equivalent), and then perform a walk-around inspection with each group. During this procedure, you are encouraged to closely examine the heavy equipment and ask questions pertinent to its condition. The principal purpose of the first station is to orient you on how to conduct an adequate visual equipment inspection with the assistance of the operator or mechanic.
- After the first station, and at each subsequent station, you will each conduct your own individual checklist inspection of the equipment (as time permits) using a different OF-296 form for each piece of equipment. You should be able to recognize and describe any equipment defects and necessary corrective action. The heavy equipment operator or mechanic will critique your individual inspection performance.
- After you have rotated through all the stations, then return to your original station for the second phase of the exercise. At this point the operators or mechanics at each station will explain that in order to perform an adequate inspection the equipment must be started. Thus, the objective of the second phase of the field exercise is to emphasize the importance of the operational check as an integral component of a thorough and adequate inspection.
- After the above explanation is given, the heavy equipment at each station will be started, if possible, and operated briefly through the following steps: (1) blade raised, lowered and tilted; (2) equipment moved forward and backward; (3) equipment turned right and left; (4) equipment shutdown. The operator or mechanic will then explain any mechanical problems the equipment exhibited, as well as what should be done for correction. This demonstration by the operator or mechanic shall serve as the orientation for the second phase of the field exercise.

- Upon completion of the second phase orientation, as time and equipment are available, each group shall rotate to all other equipment stations, individually performing inspections of the equipment during mechanical operation. As in the first phase of the exercise, the operator or mechanic should critique your performance, as well as answer any questions you might have.

Student Name \_\_\_\_\_

### **FIELD EVALUATION**

1. \_\_\_\_\_ Student observed loading and unloading and was able to describe the guidelines.

Instructor Comments:

2. \_\_\_\_\_ Student completed Pre-use Inspection. (Equipment operator or mechanic may critique individual performance.)

Instructor Comments:

3. \_\_\_\_\_ Student completed daily Walk-around Check.

Instructor Comments:



## **LOADING AND UNLOADING**

Loading and unloading will be demonstrated, students will observe only.

### Loading/unloading guidelines:

1. Park on level ground.
2. Do not use congested area.
3. Ensure brakes are set on low bed (chock block).
4. Ensure heavy equipment is properly released (unchained).
5. Perform a walk around to ensure everything is clear.
6. Act as spotter for operator.
7. Before leaving, ensure transport is in a safe area.
8. Avoid damage to improved roads.

## **DAILY WALK-AROUND CHECK EXERCISE**

Discuss the difference between the daily walk-around check and the pre-use inspection to students.

Explain that for maintenance and operator personnel safety, and maximum service life of the equipment, they should make a thorough walk-around inspection when doing lubrication and maintenance work. A good place to start the check is at the front of the heavy equipment. Always check under and around for such items as loose bolts, trash buildup, oil or coolant leaks.

Students are to complete the daily walk-around check form and the blank walk-around check drawing. Instruct students to put a check mark next to each item on the list if in satisfactory condition. The drawing can be used for taking notes on equipment parts to be inspected.

Observe and evaluate their performance during the inspection. Hand out the completed walk-around check drawing after the exercise.

## S-236, HEQB DAILY INSPECTION CHECKLIST

Date:	HEQB Name: Phone:	Vendor Name: Phone:
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### Operator/Driver Information:

Operator Name: Phone:  Last Day(s) Off:	Driver Name: Phone:  Last Day(s) Off:
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### Equipment and Transport Information:

E#:	Make/Model:
Transport Make/Model:	
Transport Trailer License #:	
E#:	License#:
State:	Trailer Load Rating:

### Equipment Inspection:

INSPECTION ITEMS	Acceptable	Not Acceptable
<b>Operator Safety</b>		
• RT-130		
• New generation fire shelter		
• PPE: Nomex clothing, leather gloves, leather boots, approved hard hat, eye and hearing protection, flashlight, etc.		
• Seat belts (serviceable)		
<b>Engine</b>		
• Oil levels		
• Belts and hoses		
• Fuel leaks		
• Cooling system (no leaks and clean)		
• Spark arrester (if equipped)		
<b>Hydraulics</b>		
• No leaks		
• All cylinders extend and retract fully		
• Hoses (serviceable)		
<b>Electrical</b>		
• Forward lights		
• Reverse lights		
• Work lights		
• Backup or travel alarm		
• Battery secured and not corroded		
<b>Overall condition of equipment</b>		
• Windows (no cracks or breaks, good visibility)		
• Undercarriage (no broken pads, rollers in serviceable condition)		
• No cracks, broken welds, missing hardware or guards, etc.		
• Tires (no cracks or cuts to cord)		
• Cutting edges (serviceable)		
• Engine compartment (e.g., belly pan), free of flammable materials		
• Fire extinguisher (secure)		

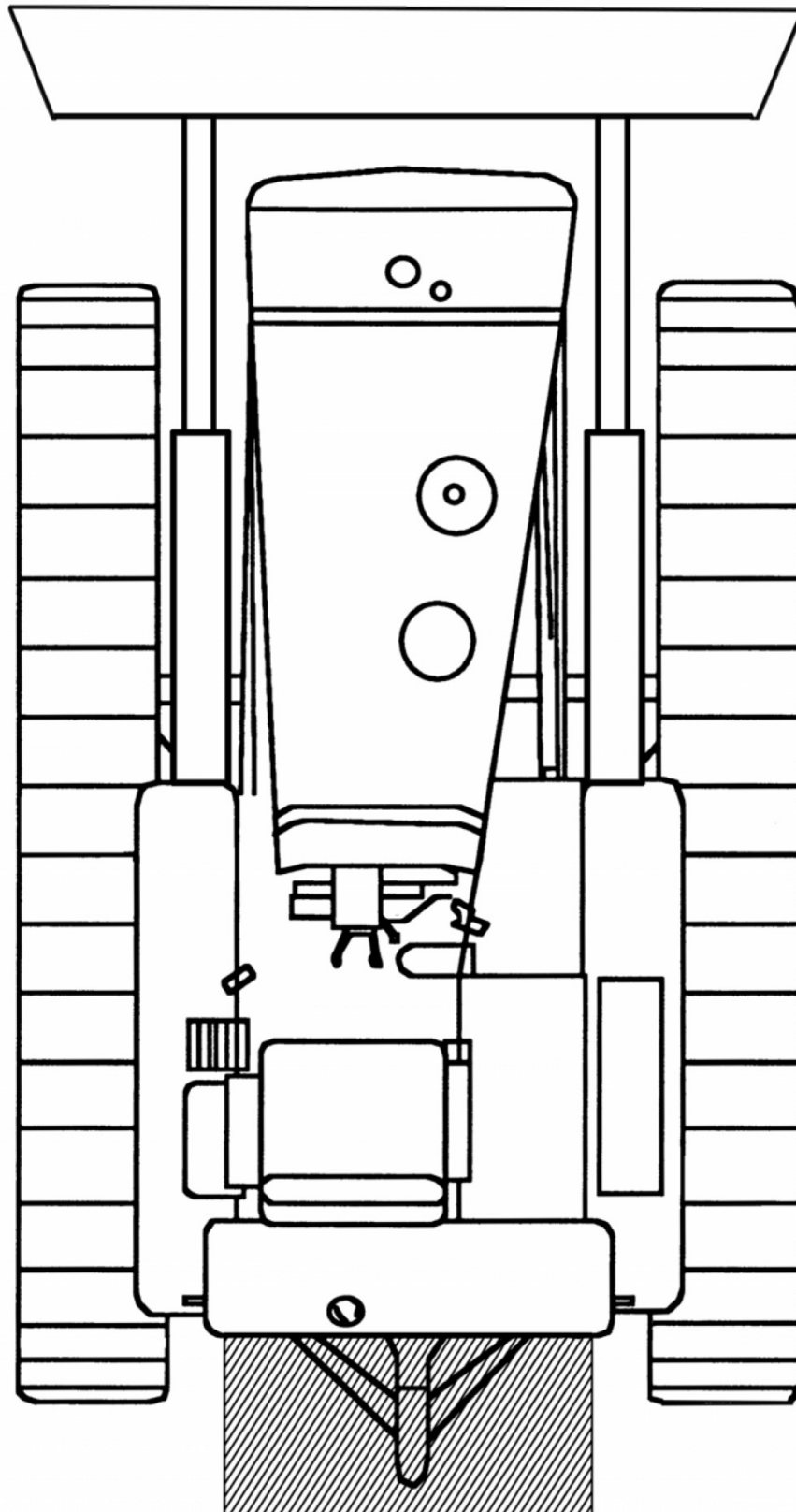
### Transport Inspection:

INSPECTION ITEMS	Acceptable	Not Acceptable
Has commercial vehicle operator performed the daily inspection?		
• Tires		
• Fuel system		
• Cooling system		
• Electrical system		
• Air		
• Brakes		
• PPE		

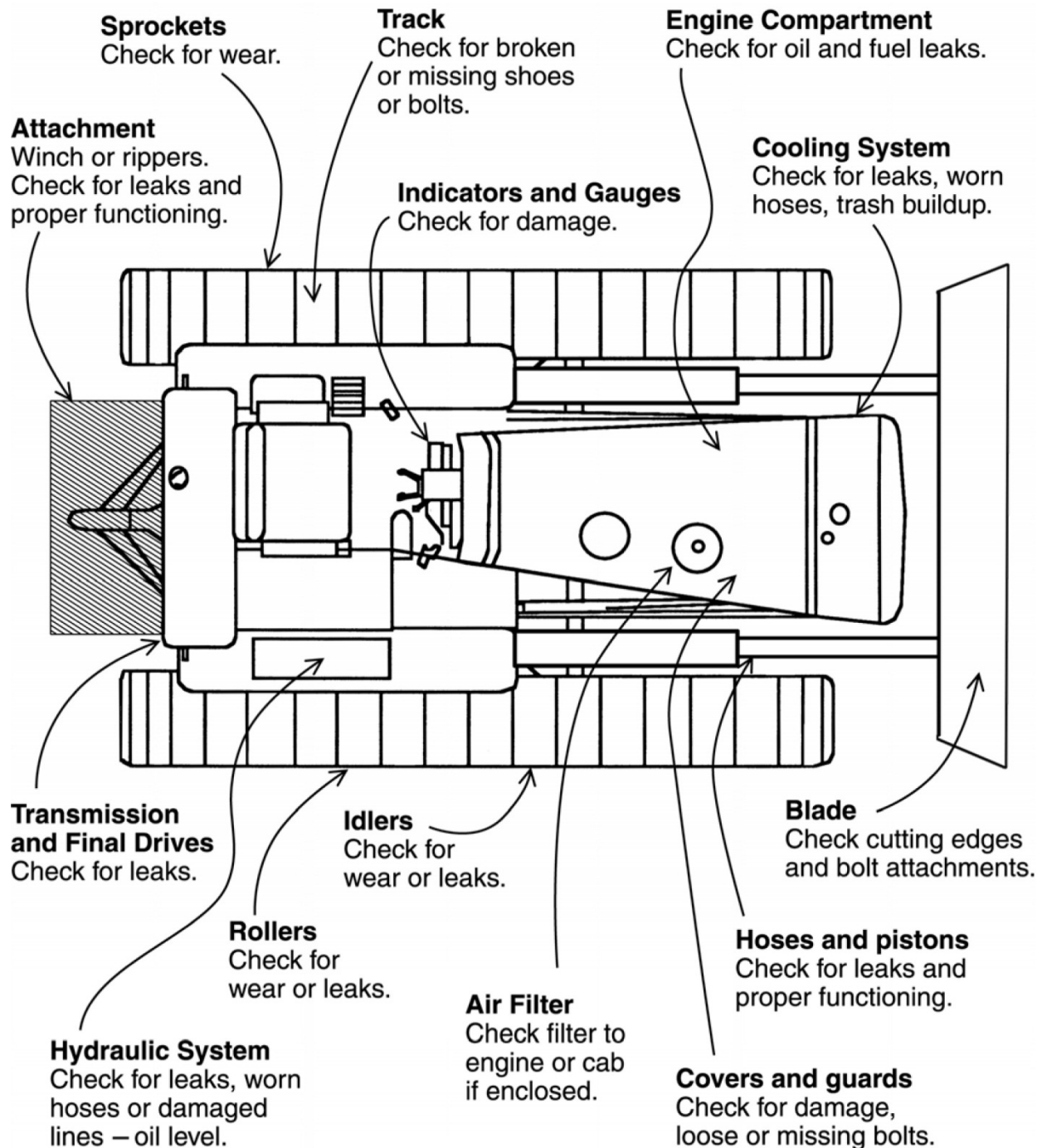
### General Observations and Comments (use back of sheet if needed):

HEQB Signature: \_\_\_\_\_

## Walk-Around Check



## Walk-Around Check



### **Class discussion**

What actions should you take if the equipment is inoperable?

What should the HEQB do if cut off from operator by fire?

### **Optional Exercises**

Suggestions for optional exercises are:

- Line construction
- Water barring
- Winching
- Flagging
- Hand communications
- Have alternative industrial machinery on display

## **Cut out and laminate for a pocket card.**

### **Daily Walk-around Check Form**

- \_\_\_\_\_ Check the blade for broken or bent push arms, adjusting arms, and condition of cutting edge and end bits.
- \_\_\_\_\_ Check hydraulic system for leaks, worn hoses, or damaged lines and oil level.
- \_\_\_\_\_ Check inside the radiator for oil. This could be an indication of a bad head gasket or broken head.
- \_\_\_\_\_ Check rollers for wear and oil leaks.
- \_\_\_\_\_ Check for leaks, water, oil, or grease under or around the dozer.
- \_\_\_\_\_ Check grouser height, tracks for broken or missing pads or bolts, cracked rails, loose pins, and tightness.
- \_\_\_\_\_ Check sprockets for wear or damage.
- \_\_\_\_\_ Check idlers for wear, oil leaks and cracks.
- \_\_\_\_\_ Check engine compartment for water in the oil, for oil and fuel leaks, for trash build-up.
- \_\_\_\_\_ Check air filter.
- \_\_\_\_\_ Check rollover protection for proper condition and record on time keeping forms.
- \_\_\_\_\_ Check indicators and gauges for damage.
- \_\_\_\_\_ Check for fire extinguisher and shovel.
- \_\_\_\_\_ Check lights.

## **Cut out and laminate for a pocket card.**

### **Dozer Entrapment Emergency Procedure Briefing to Operator**

1. Recognize rapidly changing conditions (environment).
2. Communicate situation and plan of action with work group.
3. Don't panic. Stay with dozer if possible.
4. Retreat (use escape route) to safety or deployment zone.
5. Request (call for) air drop.
6. Clear out a deployment site.
7. Burn out around deployment site-if time allows.
8. Doze trench, pushing out berm facing approaching front.
9. Position (straddle) dozer over trench, blade on berm.
10. Engage brakes, set throttle to 1/3.
11. Deploy shelter under dozer.





## **UNIT OVERVIEW**

**Course**      Heavy Equipment Boss, S-236

**Unit**          4 – Briefings and Tactics

**Time**          3 Hours

### **Objectives**

1. Discuss how relevant information is exchanged during briefings and debriefings.
2. Define other communication methods used by a HEQB.
3. Identify specific tactics used by heavy equipment on a wildfire.
4. Discuss procedures used by heavy equipment to rehabilitate a fireline.

### **Strategy**

This unit covers the necessary briefing elements a HEQB needs to comprehend: How to give a specific, concise, informative briefing and basic tactics utilized while operating/managing heavy equipment on an incident.

### **Instructional Methods**

- Classroom Lecture
- Classroom discussion
- Instructor led exercises
- Interactive group discussion

### **Instructional Aids**

- ☐ Student workbooks (1 per student)
- ☐ Personal computer with LCD projector and presentation software, wireless clicker, pointer and screen.
- ☐ Flip charts, dry erase board, markers, and erasers
- ☐ Position Task Book (1 per student)

### **Exercises**

- Alaska Fire Exercise
- Idaho Fire Exercise

## **Evaluation Methods**

- Student and class participation.
- Complete Unit exercises.

## **Outline**

- I. Effective Briefings
- II. Heavy Equipment Briefing Topics
- III. Communication
- IV. Communication Timeline
- V. HEQB Responsibilities During Tactical Operations
- VI. Tactical Uses Of Heavy Equipment
- VII. Rehabilitation

## **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:** Heavy Equipment Boss, S-236

**Unit:** 4 – Briefings and Tactics

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>	Slide 4-1
<b>Present Unit Objectives.</b>	Slide 4-2
I. EFFECTIVE BRIEFINGS	Slide 4-3
<b>Instructor will be introduced as a HEQB and demonstrate a short briefing to the class on the topic of their choice. Include the specific information listed in the Heavy Equipment Briefing Topics in section II of this unit.</b>	
<p>An operational briefing is held at the beginning of each operational period (day and/or night) to review the IAP with operations personnel. Each member of the command and general staff who has a part in the IAP makes a short presentation.</p>	Slide 4-4
<p>Effective briefings are essential. Heavy Equipment Bosses (HEQBs) need to have the ability to communicate:</p> <ul style="list-style-type: none"> <li>• Risk management expectations</li> <li>• Tactical objectives</li> <li>• Hazards including fire behavior, fuel types, terrain features</li> <li>• Environmental and cultural concerns</li> </ul>	Slide 4-5

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Contingencies (trigger points)</li> <li>• Communication</li> <li>• Logistics for the operators (equipment and support vehicle)</li> </ul> <p>Tailor the briefing by importance to the audience.</p> <p>Elements of an effective briefing:</p> <ul style="list-style-type: none"> <li>• Leader's intent and clearly stated goals.</li> <li>• Briefing should be short and concise.</li> <li>• Communicate known and potential hazards and associated risks, and reference Risk Management Process.</li> <li>• Emphasize the importance of trigger points, the need for analyzing associated risks, and the need for additional briefings before tactically engaging.</li> <li>• Ask audience if there are questions or comments on the briefing.</li> </ul>	<p>Slide 4-6</p>





OUTLINE	AIDS & CUES
<p>C. Communications</p> <ul style="list-style-type: none"> <li>• Maps, GPS</li> <li>• Incident communication plan (IAP)</li> <li>• Radio (frequencies, clone, batteries)</li> <li>• Phone systems</li> <li>• Contact numbers</li> <li>• Flagging methods, glow sticks</li> </ul>	Slide 4-11
<div> <p><b>Discussion Point</b></p> <p><b>Prior to shift, agree upon flagging methods with the operator. This could include coloring, directions, flagging gates. etc.</b></p> </div>	
<ul style="list-style-type: none"> <li>• Strobe lights</li> <li>• Hand signals</li> <li>• Signal mirrors</li> <li>• Emergency communication protocol (Medical Plan)</li> </ul>	Slide 4-12

OUTLINE	AIDS & CUES
<p data-bbox="298 281 513 317">D. General</p> <p data-bbox="394 365 1029 491">Remind operators to have adequate supply of medications and personal needs for two operational periods.</p> <div data-bbox="207 541 1052 726" style="border: 1px solid black; padding: 5px;"> <p data-bbox="220 550 285 583"><b>TIP</b></p> <p data-bbox="220 592 964 718"><b>Ensure you take notes and document events on your Unit Log to be used for the after action review (AAR).</b></p> </div> <div data-bbox="207 772 1052 1642" style="border: 1px solid black; padding: 5px;"> <p data-bbox="220 781 889 819"><b>HEAVY EQUIPMENT BRIEFING TIPS:</b></p> <ul data-bbox="220 827 1029 1633" style="list-style-type: none"> <li>• <b>Recognize some heavy equipment operators may have hearing loss due to working with equipment for many years.</b></li> <li>• <b>Verify operators can hear your briefing. You may need to speak louder.</b></li> <li>• <b>Provide copies of written information to all operators (incident action plan, maps).</b></li> <li>• <b>Make sure all operators and drivers are present.</b></li> <li>• <b>Sometimes one HEQB will give the briefing for several pieces of equipment.</b></li> <li>• <b>Respect that most operators are experienced and are looking to you for the fire behavior, safety, and logistical aspects of the job.</b></li> <li>• <b>Refer to your initial interview to gauge experience levels of operators.</b></li> <li>• <b>Be adaptive with visual aids (white board, flip chart paper, cardboard, side of vehicle, etc.).</b></li> </ul> </div>	<p data-bbox="1081 281 1230 317">Slide 4-13</p>



OUTLINE	AIDS & CUES
III. COMMUNICATION	Slide 4-14
A. Awareness	Slide 4-15
<ul style="list-style-type: none"> <li>Resources within division</li> </ul>	
<ul style="list-style-type: none"> <li>With adjacent divisions</li> </ul>	
<ul style="list-style-type: none"> <li>Aviation resources</li> </ul>	
<ul style="list-style-type: none"> <li>Other HEQBs</li> </ul>	Slide 4-16
<ul style="list-style-type: none"> <li>Other heavy equipment on incident</li> </ul>	
<ul style="list-style-type: none"> <li>Technical Specialist (Regional Fire Equipment Specialists, Equipment Manager, Resource Advisor)</li> </ul>	
B. With Operator	Slide 4-17
<ul style="list-style-type: none"> <li>Agreed upon flagging methods</li> </ul>	
<ul style="list-style-type: none"> <li>Hand signals</li> </ul>	
<ul style="list-style-type: none"> <li>Strobe light signals</li> </ul>	
<ul style="list-style-type: none"> <li>Flashing mirror signals</li> </ul>	Slide 4-18
<ul style="list-style-type: none"> <li>Agreed upon meeting times</li> </ul>	
<ul style="list-style-type: none"> <li>Agreed upon signals (engine revs, powering down, horns, lights)</li> </ul>	
<ul style="list-style-type: none"> <li>Radio systems</li> </ul>	Slide 4-19
<ul style="list-style-type: none"> <li>Cellular phones</li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Equipment breakdown, estimated time of repair</li> </ul> <p>C. With Supervisor (Chain-of-Command)</p> <ul style="list-style-type: none"> <li>• Advise supervisor on equipment configurations (if you have a Feller Buncher [hot saw] you may need a skidder, skidgine or engine to support it)</li> <li>• When recommending additional resources, recognize the difference in typing capabilities (Type I, II, III).</li> <li>• Make suggestions about the correct piece of equipment for the task.</li> <li>• Give feedback on actual and projected production rates.</li> </ul>	<p>Slide 4-20</p> <p>Slide 4-21</p>
<div data-bbox="207 1178 1052 1451" style="border: 2px solid black; padding: 10px;"> <p><b>TIPS</b>  <b>There are tradeoffs with ordering larger equipment.</b></p> <ul style="list-style-type: none"> <li>• <b>Larger equipment (Type I) may be less mobile and requires more complex logistical needs.</b></li> </ul> </div> <ul style="list-style-type: none"> <li>• Equipment breakdown, estimated time of repair</li> <li>• Transportation (logistics, lowboys)</li> <li>• Fueling</li> <li>• Maintenance cycles</li> </ul>	<p>Slide 4-22</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Time related issues</li> <li>• Operator performance issues</li> <li>• Claims/hazards</li> <li>• Logistical needs – use the chain-of-command <ul style="list-style-type: none"> <li>– Specialized maps (archaeological sites, sensitive resource areas, threatened and endangered species, wilderness study areas)</li> <li>– Hazard maps (mining area, military ordinance)</li> <li>– Slope maps</li> <li>– GIS</li> <li>– Road systems maps (are they current)</li> <li>– Pre-incident map (structure protection, water sources, identified hazards, etc.)</li> <li>– Specialized equipment – strobe lights, clinometers, fencing pliers, GPS, digital camera, stereoscope (aerial photographs)</li> <li>– Use of transport (for other equipment on incident, release, or stage).</li> </ul> </li> </ul>	<p>Slide 4-23</p> <p>Slide 4-24</p> <p>Slide 4-25</p> <p>Slide 4-26</p>

OUTLINE	AIDS & CUES
<p>D. Radio Frequencies and Use</p> <p>Many contractors have their own company radios. Some can be cloned and some cannot. If clonable radios are not required by the contractor's contract, check with cache to see if they have enough radios to issue to each piece of equipment and each HEQB (ear buds or shoulder microphones).</p> <ul style="list-style-type: none"> <li>• Magnetic mount antenna</li> <li>• Portable repeater</li> <li>• Extra batteries</li> </ul>	Slide 4-27
<p>E. Backup System if Radio Fails</p> <ul style="list-style-type: none"> <li>• Contractor radio network</li> <li>• Cellular phones</li> <li>• Routine exchange of contacts and numbers (business cards)</li> </ul>	Slide 4-28
<p>F. Hand Signals</p> <p>Hand signals may vary with each incident. Agree on hand signals. Ensure they are clearly understood before beginning assignment.</p>	Slide 4-29
<p>G. Flagging</p> <p>Proper interpretation and use of flagging during line location. Ensure flagging usage is clearly understood before beginning assignment.</p>	Slide 4-30

OUTLINE	AIDS & CUES
<p>For example:</p> <ul style="list-style-type: none"> <li>• Which side of line is flagged?</li> <li>• Directional change or stop gates?</li> <li>• Combination of flagging colors to designate specific issues, etc.</li> </ul> <p>H. Language Barriers</p> <p>Equipment operator may not speak English (check with local agency for contract clarification).</p>	
<div> <b>Exercise: Briefing Role Play</b>  <b>Refer to IR 4-1 for instructions.</b> </div>	IR 4-1 SR 4-1
<p>IV. COMMUNICATION TIMELINE</p>	Slide 4-32
<div> <b>Ask students when is it a good time to ask questions?</b> </div>	
<p>Questions to ask (examples):</p> <ul style="list-style-type: none"> <li>• Does the equipment come wet or dry?</li> <li>• Has it been inspected?</li> <li>• Is it coming with its own transport?</li> <li>• Who is supervising the transport?</li> <li>• Does the equipment have a radio?</li> </ul>	Slide 4-33
<ul style="list-style-type: none"> <li>• Is it single or double shifted?</li> </ul>	Slide 4-34

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Is it under an agreement?</li> <li>• Are the operators fireline qualified?</li> <li>• Do the operators have PPE?</li> <li>• Other questions?</li> </ul>	
<p>V. HEQB RESPONSIBILITIES DURING TACTICAL OPERATIONS</p>	<p>Slide 4-35</p>
<p>A. Situational Awareness</p> <ul style="list-style-type: none"> <li>• The operators are going to be focused on their machines and the task at hand.</li> <li>• HEQBs need to be focused on the operator, the equipment, and the surrounding environment including adjoining forces.</li> <li>• Many operators rely on the HEQB to be their eyes and ears for fire behavior, weather, and any other unseen hazards.</li> </ul>	<p>Slide 4-36</p> <p>Slide 4-37</p>
<p>B. Special Considerations</p> <p>In addition to the normal risk management considerations the HEQB will have special considerations related to heavy equipment.</p> <p>Ensure the tasks assigned do not exceed the capabilities and limitations of the assigned equipment, operator, and time table for the task at hand.</p>	<p>Slide 4-38</p> <p>Slide 4-39</p>

OUTLINE	AIDS & CUES
<p>Use operator experience as a resource. HEQB needs to listen to operator. Operator may have a different way to mitigate a hazard.</p> <p>Special considerations must be given for heavy equipment during night operations. There are both benefits and risk management considerations.</p> <p>Approved heavy equipment is designed with operator protection systems as required by OSHA and specifications outlined in the ISO/FDIS 11850.</p> <p>Operator protection systems are made up of the rollover protection systems (ROPS), and falling object protection systems (FOPS), and cab operator protection systems (OPS). Not all three protection systems are required on all equipment.</p>	<p>Slide 4-40</p> <p>Slide 4-41</p> <p>Slide 4-42</p>
<p><b>All heavy equipment is required to have OPS in place however; the level of the OPS may vary between equipment. Ensure that you have the correct OPS combination for the assigned task.</b></p>	
<p><b>Discussion Point</b>  <b>Initiate a discussion with students about the differences (machine limitations and risks).</b></p>	
<p>Operator protection systems (ROPS, FOPS, OPS) should be considered as a mitigation measure when working in an area that would present overhead or site hazards to faller and hand crews. Use the right equipment for the job.</p>	





OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• The flexible design and modifications to equipment combined with optional attachments may allow for a piece of equipment to perform multiple tasks.</li> </ul>	Slide 4-46
<ul style="list-style-type: none"> <li>• Combinations or modules including task force and/or strike teams of equipment can be an option to enable the equipment to meet the tactical needs. The HEQB may be a direct supervisor of equipment within this module; the module could be part of a group that goes through Division to accomplish its objectives.</li> </ul>	Slide 4-47
<p>E. Equipment Advances and Improvements</p> <p>Advances in equipment, weight distribution, and tread and track design allow for modern equipment to be able to go into sensitive areas with reduced damage (e.g., low ground pressure equipment).</p>	Slide 4-48
<p><b>Advances in equipment and available options also correlate to the Federal Fire Policy goal of managing for multiple objectives related to environmental concerns.</b></p>	
<p>Contractors often modify their equipment. The intent of modification is to improve performance but may result in an unsafe design. Ensure the modifications have been inspected, approved, and noted in the contract.</p>	Slide 4-49

OUTLINE	AIDS & CUES
<p>F. Regulations</p> <p>Heavy equipment operations fall under OSHA regulations.</p> <p>Specific states may have more restrictive state OSHA regulations that supersede Federal OSHA (e.g., California, Oregon, Washington, and Alaska).</p>	<p>Slide 4-50</p>
<p>VI. TACTICAL USES OF HEAVY EQUIPMENT</p> <p>Tactical decision should be detailed, decisive, well planned, and achievable.</p>	<p>Slide 4-51</p>
<p>A. Fireline Suppression Techniques</p> <p>A fireline is the part of a containment or control line that is scraped or dug to mineral soil. The various techniques used with heavy equipment include:</p>	<p>Slide 4-52</p>
<ul style="list-style-type: none"> <li>• Direct – Line constructed at fire perimeter. Refer to the Incident Response Pocket Guide (IRPG) for specific guidelines.</li> </ul>	<p>Slide 4-53</p>
<ul style="list-style-type: none"> <li>• Indirect – Line constructed at a considerable distance from the fire. Used on fast moving, high intensity fires where heat does not allow direct attack. Also used where topography or fuel loading is restrictive to direct or parallel attack.</li> </ul>	<p>Slide 4-54</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Parallel – Constructing a fireline parallel to the flank of a running fire at a safe distance to minimize radiant heat while burning out against constructed line.</li> <li>• Pincer – Direct attack from an established anchor on both flanks simultaneously where the head is pinched off.</li> <li>• Flanking – Attacking a fire by working along a flank from an established anchor point.</li> <li>• Leapfrogging – Form of direct attack where equipment (usually dozers) take turns in lead position.</li> </ul>	<p>Slide 4-55</p> <p>Slide 4-56</p> <p>Slide 4-57</p> <p>Slide 4-58</p>
<p><b>It is important for the HEQB to know when the leapfrogging occurs and what piece of equipment is now in the lead.</b></p>	
<ul style="list-style-type: none"> <li>• Potato patching – Crisscrossing of tractor plow lines to break surface fuel continuity. Common in the southeast.</li> <li>• Stripping – Removing all surface and understory vegetation between rows of timber plantation.</li> </ul>	<p>Slide 4-59</p> <p>Slide 4-60</p>

OUTLINE	AIDS & CUES
<p data-bbox="298 281 667 317">B. Line Construction</p> <ul style="list-style-type: none"> <li data-bbox="396 365 1036 705"> <p>• Specific tasks for different pieces of equipment.</p> <ul style="list-style-type: none"> <li data-bbox="488 495 789 531">– Earth moving</li> <li data-bbox="488 537 691 573">– Felling</li> <li data-bbox="488 579 732 615">– Mulching</li> <li data-bbox="488 621 854 657">– Material transport</li> <li data-bbox="488 663 805 699">– Water delivery</li> </ul> </li> <li data-bbox="396 747 1045 1213"> <p>• Design parameters</p> <ul style="list-style-type: none"> <li data-bbox="488 835 1045 871">– Width and location of dirt line.</li> <li data-bbox="488 919 915 1003">– Width and location of vegetation clearing.</li> <li data-bbox="488 1052 984 1213">– Acceptable quantity and distribution of residual vegetation, e.g., fuel break versus fireline.</li> </ul> </li> <li data-bbox="396 1262 1036 1854"> <p>• The line can be made of fireline, a fuel break, or a combination of the two. General guidelines for line width:</p> <ul style="list-style-type: none"> <li data-bbox="488 1476 1036 1560">– Either 1½ times fuel height or 1½ times flame height.</li> <li data-bbox="488 1608 1019 1770">– Operational safety following agency safety guidelines of 2 times the height of the tallest hazard trees</li> <li data-bbox="488 1818 967 1854">– Reinforce sections of line</li> </ul> </li> </ul>	<p data-bbox="1078 281 1232 317">Slide 4-61</p> <p data-bbox="1078 747 1235 783">Slide 4-62</p> <p data-bbox="1078 1262 1235 1297">Slide 4-63</p> <p data-bbox="1078 1608 1235 1644">Slide 4-64</p> <p data-bbox="1078 1818 1235 1854">Slide 4-65</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Consider additional factors of fire behavior.</li> <li>• Fuelbreak – A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled.</li> <li>• Shaded Fuelbreak – Fuelbreaks built in timbered areas where the trees on the break are thinned and pruned to reduce the fire potential yet retain enough crown canopy to make a less favorable microclimate for surface fires.</li> <li>• Fuelbreak Reinforcement – Widening a pre-constructed fuelbreak line or removing additional fuel from a fuelbreak or a shaded fuelbreak.</li> <li>• Mitigation of vegetation: <ul style="list-style-type: none"> <li>– Using heavy equipment to compress vertical fuel to a horizontal configuration (commonly referred to as walk down or walking down).</li> <li>– Place vegetation to the green side of the fireline.</li> <li>– Skid/forward vegetation to brush bays or log decks adjacent to or off of the fireline.</li> </ul> </li> </ul>	<p>Slide 4-66</p> <p>Slide 4-67</p> <p>Slide 4-68</p> <p>Slide 4-69</p>









OUTLINE	AIDS & CUES
<p>VII. REHABILITATION</p> <p>The objective is to restore disturbed areas to prevent erosion, and to leave the area as close to natural conditions as possible.</p> <p>Check with local agency or Resource Advisor for rehabilitation guidelines.</p> <p>Heavy equipment can be a valuable resource if used properly. Consideration should be used during line location and construction to minimize rehabilitation efforts.</p> <p>Areas that may need special rehabilitation consideration are:</p> <ul style="list-style-type: none"> <li>• Riparian zones <ul style="list-style-type: none"> <li>– Bogs</li> <li>– Marshes</li> <li>– Swamplands</li> <li>– Waterways</li> <li>– Springs</li> </ul> </li> <li>• Permafrost</li> <li>• Archaeological sites</li> <li>• Steep slope</li> <li>• Sandy or clay based soil</li> <li>• Residual vegetation (root wads, stumps, slash piles/dozer berm)</li> </ul>	<p>Slide 4-80</p> <p>Slide 4-81</p> <p>Slide 4-82</p> <p>Slide 4-83</p> <p>Slide 4-84</p>

OUTLINE	AIDS & CUES
<div data-bbox="207 285 1052 384" style="border: 2px solid black; padding: 5px; margin-bottom: 20px;"> <p><b>Generate a discussion with students related to rehabilitation of natural wilderness areas.</b></p> </div> <p>Rehabilitation techniques:</p> <ul style="list-style-type: none"> <li>• Water bars (How deep? How frequent? Outlet? Angle? Soils?)</li> <li>• Log placement drainage is when logs are placed at a 30° angle to direct water drainage from the fireline.  May be better than water bars due to less soil disturbance.</li> <li>• Slash filter is a tactic when the leafy top of trees are placed on the fireline and used as a filter to protect the soil and reduce erosion.</li> <li>• Filter barrier is used to prevent soil sedimentation in low lying areas.</li> <li>• Pull dozer berms and cat piles (feather debris).</li> <li>• Hydrophobic soil is soil that will not absorb water and may need to have a dozer with rippers or a tracked machine to break the surface.</li> </ul>	<p>Slide 4-85</p> <p>Slide 4-86</p> <p>Slide 4-87</p> <p>Slide 4-88</p>

OUTLINE	AIDS & CUES
<p><b>TIPS</b></p> <ul style="list-style-type: none"> <li>• <b>Tractor plow furrow – replace materials back to fireline using front dozer blade.</b></li> <li>• <b>Excavator can be used for breaking ground surface.</b></li> <li>• <b>Mulcher and chipper can be used for distributing ground cover.</b></li> <li>• <b>Make contact with private landowners who may deploy their own equipment to protect their land. Make sure you are trying to achieve the same goal.</b></li> </ul>	
<p><b>Idaho Fire Exercise, see IR 4-4.</b></p>	<p>Slide 4-89 IR 4-4 SR 4-4</p>
<p><b>Review unit objectives.</b></p>	<p>Slide 4-90</p>



## **EXERCISE: BRIEFING ROLE PLAY**

### Purpose:

Students will learn the importance of how to receive and impart heavy equipment specific information during a mock briefing.

Time: 45 minutes

### Format:

Split up students into groups, have each group pick a group member to participate in the exercise as the Incident Commander, Division Supervisor, Heavy Equipment Boss or the Operator.

### Materials Needed:

- Briefing exercise text (in IG only)
- Wildland Fire Incident Management Field Guide (suggested reference)
- Pen and Paper to take notes on the briefing.
- IRPG briefing checklist (inside of back cover)

### Exercise Instructions:

- Students should be ready to listen to the briefing, ask pertinent questions to the IC/Division Supervisor and be ready to ask/answer pertinent questions from the operator when he is re-introduced to the briefing.
  - Students will be evaluated on participation.
1. Separate class into separate groups.
  2. Pick a student from one group only to act the part of the IC/Division supervisor. Give them a copy of the briefing information located in the instructor guide.
  3. Have a student acting as an operator leave the room until the briefing is over.
  4. Have the “mock” IC/Division Supervisor read the briefing to a student acting as the HEQB.
  5. Have the “operator” come back into the room and receive a briefing from the “HEQB.”

6. Cadre should be ready to fill in gaps in questions pertaining to the briefing.
7. What questions should the HEQB ask the operator after imparting the briefing information? Some examples are listed below.
8. Briefly discuss example questions and go over discussion questions with students.
9. Ensure students briefing are concise and to the point not belabored!

**Example Questions for the operator (questions students should be asking after the briefing).**

- **Do you understand the mission and objectives?**
- **Do you understand the communications plan and do you know the locations of your safety zones and escape routes.**
- **Are you all fueled up?**
- **Do you know the contingency plan?**
- **Is this expected production achievable with your machine and track speed?**
- **How do you see this operation going, what methodology do you see working best with our mission?**
- **What is the best way for me to approach your machine when working**
- **How often should we communicate, stay in touch.**
- **Can we perform a radio check before work begins.**
- **How long can you work on a tank of fuel**

### **Discussion Question**

**Operators will not typically run their equipment at full speed for very long, how might this factor in when considering production and contingency plans?**

- **Example answers: Find out actual production speed by monitoring equipment working and re-calculate base on realistic numbers, do you as a HEQB need to re-configure your contingency plans, does the Division Supervisor/IC need briefed on the new production estimates and safety zone expectations considering the timeframes involved?)**

### **Discussion Question**

**Why do we not deck logs in the safety zone? (Example Answer: not a safety zone if there are heavy burnable fuels within it)**

### **Discussion Question**

**What information do you as a HEQB relay back to the division supervisor/IC after briefing the operator?**

- **Example answers: Production rates expected, alternate ideas for production (i.e., maybe take 40' in rather than 120' and maybe request another FB and skidder(s) off another division, time-frame to build adequate safety zone, priorities considering fire is at least 2 days out)**

**Exercise Ends. Any Questions?**





## **SAFETY ZONE GUIDELINES (Same for Heavy Equipment as Crews)**

- Avoid locations that are downwind from the fire.
- Avoid locations that are in chimneys, saddles, or narrow canyons.
- Avoid locations that require a steep uphill escape route.
- Take advantage of heat barriers such as lee side of ridges, large rocks, or solid structures.
- Burn out safety zones prior to flame front approach.
- For radiant heat only, the distance separation between the firefighter and the flames must be at least four times the maximum flame height. This distance must be maintained on all sides, if the fire has ability to burn completely around the safety zone.
- Convective heat from wind and/or terrain influences will increase this distance requirement.

### **CALCULATIONS ASSUME NO SLOPE AND NO WIND**

Flame Distance Separation Area in Height (firefighters to flame) Acres

10 ft. 40 ft. 1/10 acre

20 ft. 80 ft. 1/2 acre

50 ft. 200 ft. 3 acres

75 ft. 300 ft. 7 acres

100 ft. 400 ft. 12 acres

200 ft. 800 ft. 50 acres

Distance Separation is the radius from the center of the safety zone to the nearest fuels. When fuels are present that will allow the fire to burn on all sides of the safety zone this distance must be doubled in order maintain effective separation in front, to the sides, and behind the firefighters.

Area in Acres is calculated to allow for distance separation on all sides for a three person engine crew. One acre is approximately the size of a football field or exactly 208 feet x 208 feet.



## **EXERCISE: Alaska Exercise –Tactical Decision Making**

### Purpose:

Learning to make tactical decisions while on an incident, best method of attack, placement of resources, advantages/disadvantages of equipment, safety/risk management concerns.

Time: 20 min.

Format: Break out groups

### Materials Needed:

- Map(s)
- Flip Chart with markers
- IRPG
- Wildland Fire Incident Management Field Guide (suggested reference)

### Preparation:

1. Break out into groups of a manageable size
2. Select a student lead that will coordinate and present the groups observations
3. Give each group a couple of the questions to answer, the Idaho Exercise is 5 parts, the Alaska Exercise is only 2 parts. Do not assign all the questions for the Idaho Exercise to each group due to time constraints in this long unit.
4. Prepare to answer questions and fill in knowledge gaps for students.

Instructions:

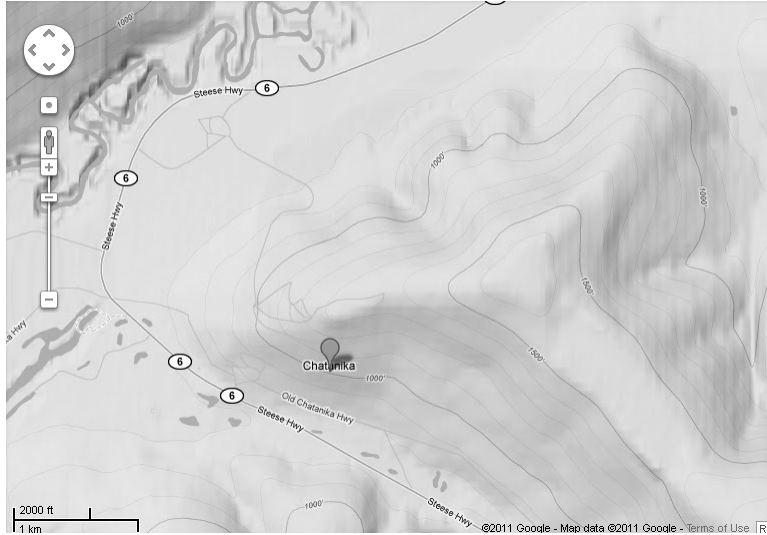
1. Read the scenario; utilize the Power Point and Maps provided.
2. After 15 minutes, answer the scenario questions within your groups and provide input pertaining to the scenario.
3. Utilizing a student lead present your information to the class.
4. Discuss your findings with the instructor and the class.
5. Exercises will be evaluated by each individual group cadre member based upon: group cohesion, group comprehension of exercise, and observations discussed by the group.

**The following are some of the points and observations:**

- **Decision made by group to go direct or indirect.**
- **Did the group identify any safety factors?**
- **Did the group have a solution for mitigation of safety issues?**
- **Did the group have pertinent questions to ask the Ops in order to clarify their assignment?**
- **Did the group recognize that afternoon's weather could impact their operation? (Getting hotter and drier.)**
- **Were permafrost issues discussed?**

## **You Are a Heavy Equipment Boss in Fairbanks, Alaska On the Chatanika Fire**

It is June 23<sup>rd</sup>; you have been reassigned as a HEQB on a transitional fire 12 miles NW of Fairbanks, Alaska. You arrive at staging at 1130 and tie-in with the Operations Section Chief (Ops) of the rapidly assembled ICT3 team. Much of the



overhead is detailing from outside of the Area; some IA forces are being reassigned to new starts.

Ops informs you that the fire started last night and is now about 60 acres, predominately burning in Black Spruce. He's

assigning you to Division A, the left flank. Your DIVS is en route with an ETA of 1300, and the division is currently unstaffed. Ops assigns you 2 Type 2 dozers, which have just arrived.

Some line has been put in by hand crews and engines, and is holding along the heel. The fire has hung-up on a seismic trail along the lower part of Div A, which he wants you to improve; he plans to have crews hold this line. The fire continues to move up-slope towards a large infrastructure of communications equipment 1 mile to the NE of the seismic trail. He informs you that the National Park boundary is 2 miles NE of the fire, and there are various gold mining camps in the area. Division D, the right flank, is being staffed by 3 type 6 engines and 1 type 2IA hand crew.

Ops plans on placing a resources order soon, but wants your input on what Heavy Equipment will be needed to accomplish the strategies of seismic trail improvement, direct fire line construction along Div A and protection of the communications equipment. He is also concerned that the fire will spot onto the north side of the ridge, where afternoon winds could push it towards cabins along the river. He wants to know if you can go indirect on the backside of the ridge if necessary, or if he'd be better off ordering more hand crews. You get into your rental pickup for a recon of division A.

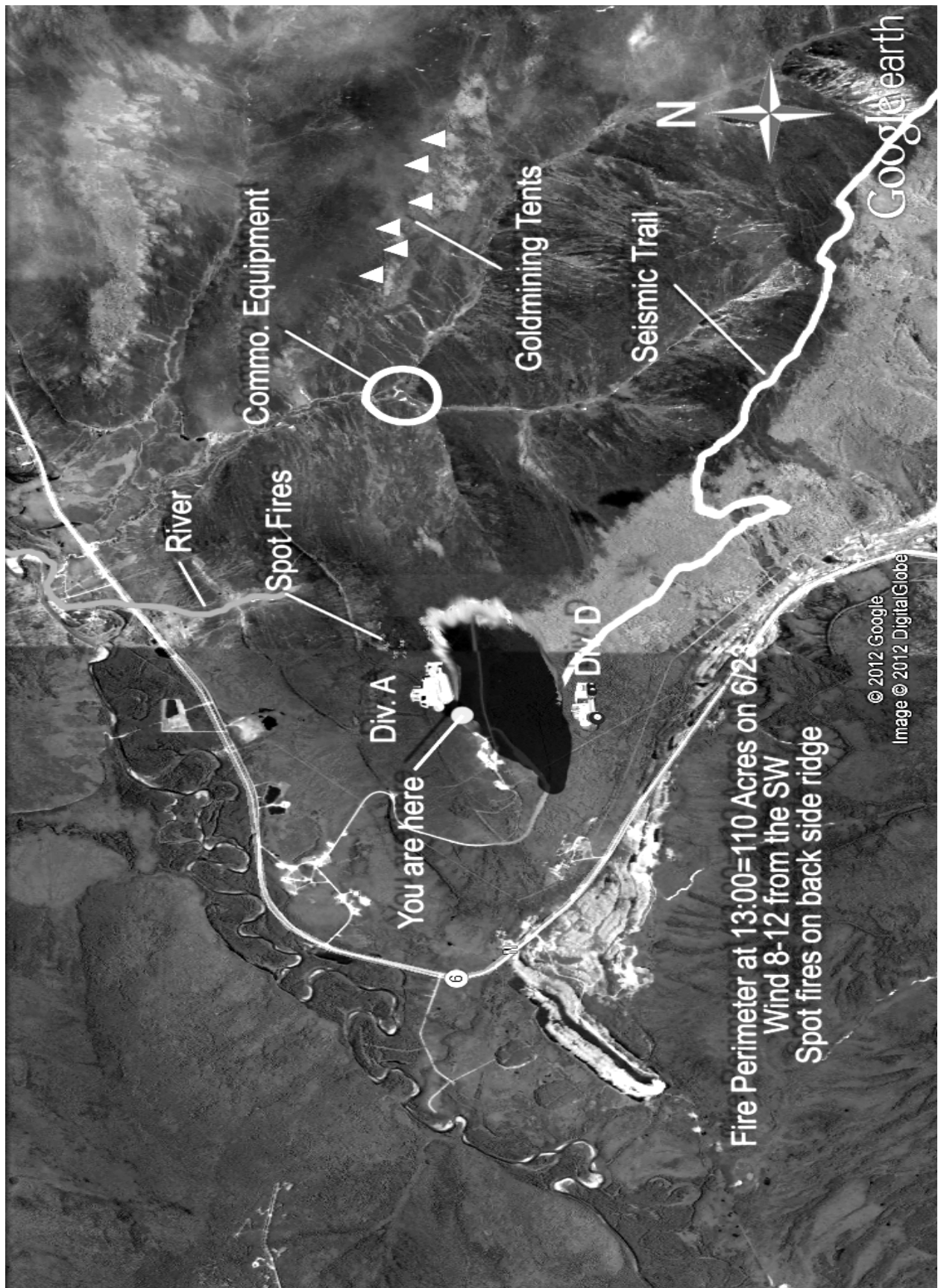
**1100 Observed Weather:** 77 degrees, 35% RH, winds SW 5.

**Predicted afternoon weather:** 86 degrees, 28% RH, winds S 12-15.

1. What are the tasks you, as a Heavy Equipment Boss, need to accomplish, to be sure your assigned equipment and personnel are able to accomplish your objectives safely and efficiently?

2. When will you updating Ops? List any questions or clarifications needed, issues you anticipate, additional resources needed, production rates, possible line location, etc.

**NOTES:**





## **EXERCISE: Idaho Exercise (5-part scenario)**

Purpose: HEQBs will learn tactical decision making components: placement of resources, best method of attack, advantages/disadvantages of equipment, safety/risk management concerns.

Time: 10 minutes/exercise part. This is a 5-part scenario.

Format: Break out groups

### Materials Needed:

- Map(s)
- Flip chart with markers
- IRPG
- Wildland Fire Incident Management Field Guide (suggested reference)

### Preparation:

1. Break out into groups of manageable size.
2. Select a lead student that will coordinate and present the groups observations.

### Instructions:

1. Read the scenario/each part is meant to be read individually then worked as a group before moving onto the next scenario.
2. After 10 minutes, one group will be chosen to present the groups observations at the end of each level.

3. Exercises will be evaluated by each individual group cadre member based upon: group cohesion, group comprehension of exercise, and observations discussed by the group.

**The following are some of the points and observations:**

- **Part 1 – Did the group recognize:**
  - **Potential issues arising from information provided at the briefing (Crew having to go to safety zone twice in two shifts, spot fires potential, lacking overhead to manage positions, lack of ground support vehicles to utilize for recon.)**
- **Part 2 – Did the group have pertinent questions for the Div Sup.**
  - **Did the group identify safety issues? ( 3 HEQB's in one truck, hotshot member acting as a HEQB, lots of dead trees)**
- **Part 3 – Did the group recognize safety issues? (cannot see main fire, slower than expected production rates)**
  - **Did the group do the math to see if the DIVS production expected was reasonable considering tree type and slope and time of shift?**
- **Part 4 – Did the group recognize:**
  - **Communication getting weaker and scratchier.**
  - **Escape route not seen.**
  - **Weather getting hotter/drier/ more unstable.**
- **Part 5 – Did the group recognize:**
  - **Is the safety zone accessible due to time constraints and track speed of your machine?**
  - **Are there alternate areas that may be utilized as a safety zone?**

## **Idaho Exercise**

### **Planning Ops assigns you to Division Bravo**

#### **Part 1**

**September 9th, 1130:** You have arrived at the ICP of the Red River fire, which has been burning on the Nez Pierce National Forest for 18 days. Weather has significantly increased the fire's activity and it is now 43,000 acres. The fire increased in size by 3,200 acres yesterday, moving predominantly in a southeast direction; the small town of Dixie and two ranches are threatened. Many unassigned resources have recently arrived, including other HEQB's, but after some confusion you have been assigned to Division B by Planning Ops and received a briefing from the Operations Section Chief (Ops).

In the briefing you are shown that your division is located approximately 11 miles northeast of the ICP and runs north to south, in a forest fuel type of sub alpine fir and lodge pole. The inversion has been breaking by 1100, winds have been picking up by 1300. RH is predicted to be 9% by early afternoon with wind speed and direction of 10-15NW. Resources on your division has gone into safety zones the last two shifts. The IMT2 team's objectives are to hold the fire west of the 1194 rd. and north of the Jack Mtn. rd. Your division is building a contingency line up a spur ridge from the Dixie road southeast to the NF rd. 1194, constructing direct line south from the Dixie rd., and securing two spot fires that crossed the division's fireline yesterday. Your DIVS has recently received additional Heavy Equipment resources but is short on overhead to supervise them; he is anxious for you and your fellow HEQB's to arrive on the line.

At Ground Support you discover there are no available vehicles. The best solution is to ride with a fellow HEQB who has an agency vehicle and is also newly assigned to Division B. Another HEQB just assigned to Division B will also be riding with you. You are handed an IAP and maps and told to report to the DIVS by 1330, giving you time to get your camp set up and obtain supplies.

**Would you have any questions for the Operations Section Chief during his briefing?**

**What are your thoughts concerning this assignment?**

**What supplies will you obtain?**

**Do you see any potential issues?**

## Part 2

**September 9th, 1315:** You were able to contact DIV Echo on your division's tactical channel and received instructions to meet him for a face to face at the intersection of NF rd. 1194 and Jack Mountain Rd. On the ride up the mountain you observe a smoke column well below and to the northwest of you; the DIVS is looking at a map on his truck's hood when you arrive at the intersection at 1330.

The inversion has dissipated and visibility is good. You notice the winds are 3-5 from the north. The forest on both sides of the intersection seems to have a high percentage of sick and dead lodgepole. The DIVS gives you a briefing and describes the tasks the division is involved with. These include direct attack below and approximately 3 miles to the northwest of you, where you saw the smoke column, mop-up of spot fires below and about 2 miles your south, and a fuel break being constructed below you that will come up to the road you are on (Jack Mountain Rd.). The DIVS is surprised to see 3 of you in one pickup, but divides you up in what he feels is a logical manner. You are to be dropped off at the location of the feller-buncher constructing the fuel break; a hot shot crew member has been supervising this piece of equipment for the last 2 shifts. Dan, one of your fellow HEQB's is to be dropped off at one of the spot fires to supervise 2 dozers that are lining it, he wants one of these dozers, a Type III, to be re-tasked and begin constructing a one blade fuel break up the contingency line you will be on; this equipment is also being supervised by a member of a shot crew. Bill, the last HEQB, has the pickup and will supervise a masticator that is thinning the Jack Mountain Rd., heading towards the upper end of the fuel break under construction.

**Would you have any questions for the Division Supervisor?**

**What are your thoughts concerning your assignment?**

**Do you see any potential issues?**

### **Part 3**

**September 9th, 1400:** You tie in with the feller buncher and the shot crew member who has been supervising it. You can no longer see the smoke column activity which you believe is to your west at about your elevation or slightly below you. You observe that the fuel break is nearly 50 feet wide and that the tree bundles are being key-holed on the “green” side of the break. The slope is roughly 40% and heavily treed with numerous DBH’s of 14-18 inches. You ask the crew member where and when they started this shift; he responds that they began cutting at 1000 and are now going to have a lunch break, and that he flagged their days start point. The feller buncher started working on this contingency line yesterday, cutting .5 miles on that shift. During their break you pace off the distance cut today at about .25 miles. You consult your map and estimate that you have an additional 1.5 miles to cut before reaching Jack Mountain Rd. The DIVS has the expectation that the fuel break will be done by end of shift tomorrow.

**Would you have any questions for the hotshot crew member?**

**What are your thoughts concerning your assignment?**

**Do you see any potential issues?**

**What other actions will you take?**

## **Part 4**

**September 9th, 1430:** You observe the operator and crewmember ending their lunch. You thank the crew member for the briefing, double check the operator's name (Fred), and move about 400 feet below and to the "black" side of the fuel break and observe the operation. The operator appears to be competent with the machine with no wasted motion and logical placement of trees and bundles.

You have been monitoring your tactical channel and you have noted an increase in the communication tempo concerning fire behavior, and once again are able to see the smoke column which has sheared towards you from west winds aloft. You realize the wind has been picking up and you now note numerous gusts to 10-12mph from the west northwest. You mentally review your escape route and realize you haven't actually seen your safety zone which is below the road you came in on.

Your DIVS contacts you on your division tactical channel for an update; he is scratchy and weak, but readable.

**What will you report to your DIVS?**

**Do you see any potential issues?**

**What actions will you be taking?**



## **Part 5**

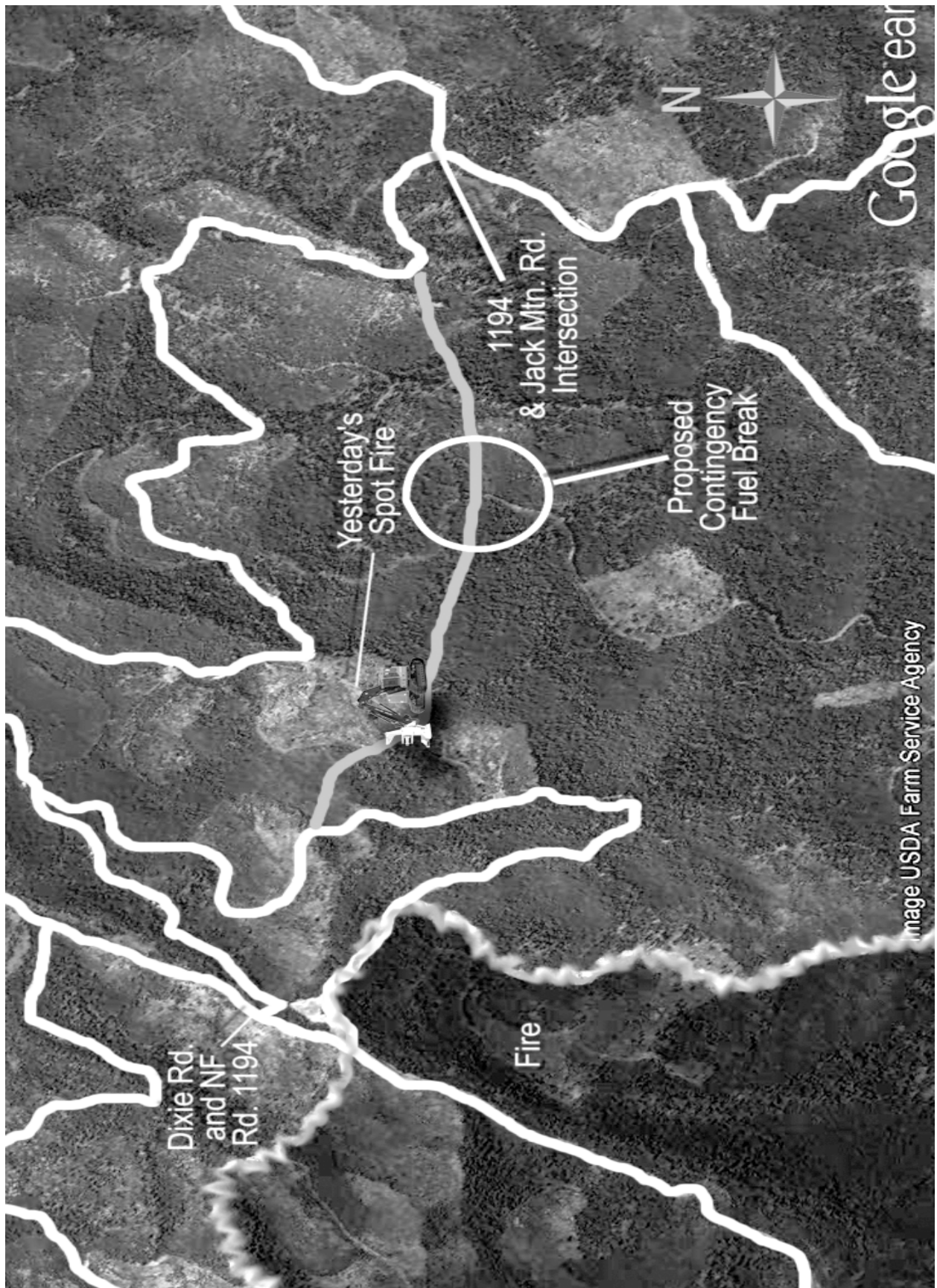
**September 9th, 1510:** Due to an increase in winds and fire behavior, and after advising your DIVS, you are withdrawing with your feller-buncher to the safety zone, which is about .3 miles to your northwest; your equipment's track speed is about 1 mph. You will cross the 1194a rd. in .2 miles and it has a wide turnout where the contingency line leaves it. One of yesterday's spot fires abuts your contingency line above the 1194a rd. and is about .15 miles from your position. Earlier on your way up the contingency line you noted this 15 acre spot fire had hard black up against your line. This is the spot that Dan is securing with his 2 dozers. You are disappointed because you estimate you only progressed about 5 chains since lunch.

You hear radio traffic on your tac channel stating there is a new spot fire below the 1194a rd.

**What are your thoughts concerning your escape route and safety zone?**

**Do you see any potential issues?**

**What actions will you take?**



## **UNIT OVERVIEW**

**Course**      Heavy Equipment Boss, S-236

**Unit**          5 – Safety

**Time**          2 Hours

### **Objectives**

1.      Describe how to apply the risk management process as it relates to heavy equipment.
2.      Describe safety procedures and guidelines when working on or around heavy equipment.
3.      Discuss the process to correct safety issues with contract equipment.
4.      Discuss manmade and environmental factors that can affect safety when working with Heavy Equipment.

### **Strategy**

This Unit covers the principles of Risk Management associated with Heavy equipment. It also emphasizes standard safety procedures and LCES.

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

- Classroom Instruction
- Class Discussion
- Interactive group discussion
- Exercise(s)

### **Instructional Aids**

- ☐ Flip chart with markers
- ☐ Personal computer with LCD projector and presentation software

### **Exercise(s)**

- South-Central Oregon Exercise #4

### **Evaluation Method(s)**

- Student and class participation. Complete Unit exercises.

## **Outline**

- I. Use the Risk Management (RM) Process
- II. Heavy Equipment Safety
- III. Escape Routes and Safety Zones
- IV. Road System for Access
- V. Environmental
- VI. Operational Periods

## **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:** Heavy Equipment Boss, S-236

**Unit:** 5 – Safety

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>	Slide 5-1
<b>Present Unit Objectives.</b>	Slide 5-2
<p>I. USE THE RISK MANAGEMENT (RM) PROCESS</p> <p>As you might surmise for this class, most personnel at this level already are applying risk management in an intuitive manner.</p> <p>This unit is designed to reinforce and clarify the application of Risk Management for the single resource boss level as it applies to the HEQB.</p> <p>Although RM is not a safety program in and of itself, it is a key component of an overall safety program.</p> <p>Safety is a natural outcome or byproduct of effective risk management. RM minimizes the effects of hazards that cause injury, loss of lives, and damage or destruction of equipment and should ultimately result in operational success.</p> <p>RM is the principal risk-reduction process to protect personnel and the goal is to make it a routine part of both the planning and execution of operations.</p>	<p>Slide 5-3</p> <p>Slide 5-4</p> <p>Slide 5-5</p>

OUTLINE	AIDS & CUES
<p>RM is a systematic process designed to:</p> <ul style="list-style-type: none"> <li>• Reduce the risks associated with operational hazards.</li> <li>• Bring personnel to a common understanding of how to identify and manage risk.</li> <li>• Give management the ability to identify and manage risks associated with all operations.</li> </ul>	Slide 5-6
<p>The foundational concept of RM – Convert the hazard to a <i>risk</i>.</p> <p>The terms <i>hazard</i> and <i>risk</i> are often used interchangeably; however, they have two distinct meanings as described below:</p>	Slide 5-7
<p><b>Hazard</b> – A condition or situation that exists within the working environment capable of causing physical harm, injury, or damage.</p> <p>In addition, hazards may result in mission degradation.</p>	Slide 5-8
<p><b>Risk</b> – An expression of possible loss in terms of severity and probability (associated with human interaction).</p> <p>As this unit is instructed think of how to apply RM to the information presented.</p>	Slide 5-9

OUTLINE	AIDS & CUES
<p data-bbox="201 281 803 317">II. HEAVY EQUIPMENT SAFETY</p> <p data-bbox="298 365 1045 789">The HEQB should be trained how to work safely around equipment. Unsafe practices by either the operator or those around the equipment can create very dangerous situations. Injury accidents involving heavy equipment have a higher probability of resulting in a fatality or serious injury than many other types of accidents. It is critical to follow all agency and OSHA safety rules and procedures when working around heavy equipment.</p> <ul style="list-style-type: none"> <li data-bbox="298 835 1029 919">• Ensure equipment operators adhere to safe work practices (OSHA and agency).</li> <li data-bbox="298 961 1013 1304">• Monitor condition of assigned resources and ensure work/rest guidelines are met. <ul style="list-style-type: none"> <li data-bbox="396 1094 1013 1220">– If the operator is also the transport driver consider limitations of hours driven per day.</li> <li data-bbox="396 1262 964 1304">– Follow agency driving policies.</li> </ul> </li> <li data-bbox="298 1346 948 1388">• Look out for other nearby personnel.</li> <li data-bbox="298 1430 1045 1598">• Safety circle is generally 200-300 feet depending upon piece of equipment and site conditions. Some equipment will have safe working distance placards.</li> <li data-bbox="298 1640 899 1682">• Good communication is essential.</li> <li data-bbox="298 1724 1029 1850">• High visibility vests will help the operator to quickly locate personnel, as well as increasing personnel safety on roadways.</li> </ul>	<p data-bbox="1078 281 1235 317">Slide 5-10</p> <p data-bbox="1078 365 1235 401">Slide 5-11</p> <p data-bbox="1078 835 1235 871">Slide 5-12</p> <p data-bbox="1078 961 1235 997">Slide 5-13</p> <p data-bbox="1078 1346 1235 1381">Slide 5-14</p> <p data-bbox="1078 1430 1235 1465">Slide 5-15</p> <p data-bbox="1078 1640 1235 1675">Slide 5-16</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Wear hearing protection when required. If it has been determined that noise levels around the equipment could potentially cause hearing loss, always use protective plugs or muffs when working on or around the equipment.</li> <li>• Never jump onto or off the equipment. Operators should always use the three-point contact rule when climbing onto or off heavy equipment. The three-point rule means having both feet and one hand, or one foot and both hands in contact with the equipment and/or ladder access at all times.</li> </ul>	<p>Slide 5-17</p> <p>Slide 5-18</p>
<div style="border: 2px solid black; padding: 10px;"> <p><b>TIP</b>  <b>The nature of heavy equipment provides a safer work environment for the operator. Risk to fireline personnel is reduced when heavy equipment performs line construction and all non-machines essential personnel are not assigned near the equipment's work area.</b></p> </div>	
<p>III. ESCAPE ROUTES AND SAFETY ZONES</p> <p>Heavy equipment can be a valuable tool when constructing escape routes and safety zones. A HEQB should work closely with their supervisor and/or the Safety Officer to ensure they are receiving specific directions regarding the placement of escape routes, size and location of safety zones.</p> <p>Your supervisor may request information from the HEQB for the time and equipment needed to construct escape routes and safety zones.</p>	<p>Slide 5-19</p> <p>Slide 5-20</p> <p>Slide 5-21</p>



OUTLINE	AIDS & CUES
<p>Considerations:</p> <ul style="list-style-type: none"> <li>• Ensure operator and other assigned personnel are aware of escape route and safety zone locations.</li> <li>• Flag routes to ensure awareness when necessary.</li> <li>• Determine if escape routes and safety zones are adequate for equipment and other resources.</li> </ul>	<p>Slide 5-22</p>
<p><b>TIP</b></p> <p><b>Due to the variability of equipment operators, terrain, and fuel types, it is often best to observe equipment working for a period of time to determine actual production rates.</b></p> <p><b>Examples of Heavy Equipment Production Rates and Costs are listed in IR 5-1 and SR 5-1</b></p>	<p>IR 5-1 SR 5-1</p>
<p><b>TIP</b></p> <p><b>Use available resources for calculating safety zones and equipment production rates, etc., many are available online.</b></p> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>• <b>Wildland Fire Incident Management Field Guide</b></li> <li>• <b>Incident Response Pocket Guide (IRPG)</b></li> </ul>	

OUTLINE	AIDS & CUES
IV. ROAD SYSTEM FOR ACCESS	Slide 5-23
<p>Risks associated with road systems can be tied to various factors, such as the type of equipment being transported, condition of the road, and the maintenance level of the road.</p> <p>Examples of hazards include:</p>	Slide 5-24
<ul style="list-style-type: none"> <li>• Surface materials <ul style="list-style-type: none"> <li>– Cobble (wash board, base rock)</li> <li>– Pavement</li> <li>– Unimproved road (two track and native surface)</li> </ul> </li> </ul>	Slide 5-25
<ul style="list-style-type: none"> <li>– Oil, bound (water, salts, magnesium chloride)</li> <li>– Gravel, sand, and pumice</li> </ul>	Slide 5-26
<ul style="list-style-type: none"> <li>• Slopes (expressed in percent) <ul style="list-style-type: none"> <li>– Uphill and downhill</li> <li>– Out sloped</li> </ul> </li> </ul>	Slide 5-27
<ul style="list-style-type: none"> <li>• Bridges <ul style="list-style-type: none"> <li>– Permanent or temporary</li> <li>– Gross vehicle weight (GVW) posted</li> </ul> </li> </ul>	Slide 5-28
<ul style="list-style-type: none"> <li>– Designed for vehicle or equipment use</li> </ul>	Slide 5-29

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Height and width limitations</li> </ul>	Slide 5-30
<ul style="list-style-type: none"> <li>– Condition and age</li> </ul>	
<ul style="list-style-type: none"> <li>– Ownership (variations in seasonal load limit)</li> </ul>	
<ul style="list-style-type: none"> <li>• Culverts</li> </ul>	Slide 5-31
<ul style="list-style-type: none"> <li>– Load ratings</li> </ul>	
<ul style="list-style-type: none"> <li>– Condition</li> </ul>	
<ul style="list-style-type: none"> <li>– Design (material: metal, concrete, wood)</li> </ul>	Slide 5-32
<ul style="list-style-type: none"> <li>– Depth of surface material to the top of the culvert (check with local engineers for adequate depth of surface material).</li> </ul>	
<ul style="list-style-type: none"> <li>• Other water crossings</li> </ul>	Slide 5-33
<ul style="list-style-type: none"> <li>– Low water crossing (sometimes called a ford or swale, can be natural or constructed)</li> </ul>	
<ul style="list-style-type: none"> <li>– Corduroy (also used in wetlands)</li> </ul>	Slide 5-34
<ul style="list-style-type: none"> <li>• Turnouts</li> </ul>	Slide 5-35
<ul style="list-style-type: none"> <li>– Availability</li> </ul>	
<ul style="list-style-type: none"> <li>– Distance</li> </ul>	
<ul style="list-style-type: none"> <li>– Size</li> </ul>	Slide 5-36
<ul style="list-style-type: none"> <li>– How many</li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Traffic <ul style="list-style-type: none"> <li>– One-way or two-way</li> <li>– Timing (Is road congested at certain times?)</li> <li>– Load (how often is it used)</li> <li>– Controlled access (opened, closed, gated)</li> </ul> </li> <li>• Access and egress <ul style="list-style-type: none"> <li>– Narrow mountain roads</li> <li>– Switchbacks (hairpin turns)</li> <li>– Soft shoulders</li> <li>– Traffic congestion</li> <li>– Overhanging branches (mirrors, glass, hydraulic lines)</li> <li>– Debris and blowdown</li> <li>– Speed bump (Kelly humped)</li> </ul> </li> <li>• Visibility <ul style="list-style-type: none"> <li>– Time of day</li> <li>– Smoke</li> <li>– Condition of windshield</li> <li>– Line of sight</li> </ul> </li> </ul>	<p>Slide 5-37</p> <p>Slide 5-38</p> <p>Slide 5-39</p> <p>Slide 5-40</p> <p>Slide 5-41</p> <p>Slide 5-42</p> <p>Slide 5-43</p> <p>Slide 5-44</p>







OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>○ Poisonous (poison oak and poison ivy)</li> <li>– Slash</li> <li>○ Volume</li> <li>○ Type (woody, logs, trees, shrubs or combination)</li> <li>○ Removal/consolidate debris (skid, brush bay/keyhole, pile, mulch)</li> </ul>	<p>Slide 5-60</p> <p>Slide 5-61</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>TIP</b>  <b>Consider how fuel type and continuity affect escape routes, distance, and safety zone size.</b></p> </div>	
<p>VI. OPERATIONAL PERIODS</p> <p>Equipment and incident personnel interactions during different operation periods can be more complex for the HEQB.</p> <ul style="list-style-type: none"> <li>• Shift change (overlapping of equipment and incident personnel)</li> <li>• Night operations (visibility of personnel and hazards)</li> <li>• Logistics (servicing, fueling, and transporting)</li> <li>• Ensure scheduling needs are met within the operational period.</li> </ul>	<p>Slide 5-62</p> <p>Slide 5-63</p> <p>Slide 5-64</p> <p>Slide 5-65</p>



OUTLINE	AIDS & CUES
<b>TIP</b> <b>Night or swing shift operations can provide advantages to the equipment and its production rates due to cooler temperatures, reduced fire behavior, and less incident personnel on the line.</b>	
<b>Oregon Fire Exercise, see IR 5-2 for instructions.</b>	Slide 5-66 IR 5-2 SR 5-2
<b>Review unit objectives.</b>	Slide 5-67



## **EXAMPLES OF HEAVY EQUIPMENT PRODUCTION RATES**

**The following is an excerpt from the Mechanized Equipment for Fire and Fuels Operations, 2009 (page 34):**

### **FELLER BUNCHER AND HARVESTER TASKS**

Felling machines are best suited for quick line clearing and opening up wide sky space in accordance with the long-standing fireline width rule:

1½ times as wide as the height of the dominant fuel.

Thus, in 100 ft. tall timber the fireline width to successfully reduce fire spread from convection and radiation heat would be 150 ft. As a rule, at 100-150 stems felled/hour, or approximately 4 acres cleared a day, for a 150 ft. wide fireline one feller buncher can clear about 1200 ft. of line in 10 hrs. (2400 ft. if double shifted, or by adding another machine). At a modest 50 ft. wide fireline canopy opening, one machine could clear the recommended open space for approximately 3500 ft. in 10 hours (or 7000 ft./double shift day).

## EXAMPLES OF HEAVY EQUIPMENT PRODUCTION COSTS

Comparison of line construction methods 1 mile of line, 50 feet cleared of timber (6 acres) 2 feet to mineral soil

Equipment	Cost for 1 Mile of Line	Line Quality	Safety
Dozers	\$1,800/shift x 4 shifts = <b>\$7,200</b>	Trees pushed over by roots. Creates a big long windrow of green trees, slash and dirt ready to catch a spot which is difficult to mop up. Significant soil disturbance with significant rehab needed	No manual falling, difficult to drop individual hazard trees in green
Crews	\$10,000/shift x 10 shifts = <b>\$100,000</b>	Trees cut, bucked, carried by hand and piled on outside of the line creating a large jackpot of fuel. 2 feet to mineral soil, minimal rehab	Significant exposure from falling timber and hazard trees
Feller-Buncher, Tracked Skidder	\$5,200/Shift x x 7 shifts = <b>\$3,640</b>	Trees cut and removed or some retained for rehab. Minimal soil disturbance, 2 feet to mineral soil minimal rehab	No manual falling, hazard trees cut mechanically, creates safe work area for crews

### Daily rates for:

- Feller-Buncher Type 1- **\$3,410**
- Rubber Tired Skidgine Type 3- **\$1,900**
- Excavator Type 2- **\$1,820**
- 20 person Crew- **\$ 10,000**
- Engine Type 6 - **\$ 1,436**

Source for Daily rates: Northern Rockies and Rocky Mountain-Great Basin Incident Business Management Handbook Supplements

## **EXERCISE: Oregon Fire**

Purpose: HEQBs will learn to recognize safety issues associated with heavy equipment operation and management. This scenario will also reinforce tactics and tactical decision making.

Time: 10 minutes per part. This is a 5-part exercise.

Format: Break out into groups.

### Materials Needed:

- Map(s)
- Flip chart with markers
- IRPG
- Wildland Fire Incident Management Field Guide (suggested reference)

### Preparation:

1. Break out into groups of manageable size.
2. Select a lead student that will coordinate and present the groups observations.
3. Give each group a couple of the questions pertaining to this exercise; do not assign each table all 5 parts if there is a time constraint.

### Instructions:

1. Read the scenario/each part is meant to be read individually then worked as a group before moving onto the next scenario.
2. After 10 minutes, one group will be chosen to present the groups observations at the end of each level.
3. Exercises will be evaluated based upon: group cohesion, group comprehension of exercise, and observations discussed by the group.

**The following are some of the points and observations:**

- **Part 1 – Did the group recognize:**
  - **Poor Communication with DIVS**
  - **Confusing directions to staging area**
  - **Inadequate staging area with other division's equipment.**
- **Part 2 – Did the group recognize:**
  - **Overhead calling resources by different names. (timbco, hotsaw)**
  - **DIVS approving plan verbally without scouting.**
  - **Fire activity increasing.**
  - **Are you still within your span of control as a HEQB?**
- **Part 3 – Did the group recognize:**
  - **Increasing fire activity, spotting, etc.**
  - **Communication getting worse and more convoluted on the tac channel.**
  - **Poor communication with assigned resources ( i.e., dozer)**
  - **Production slowing due to lag of Skidder, other resource not yet on scene.**
- **Part 4 – Did the group recognize:**
  - **Equipment blocking access/egress**
  - **Transport issues are arising and deployment to safety zone may be imminent.**
- **Part 5 – Did the group recognize:**
  - **Did the group come up with a reasonable solution for transporting both feller bunchers?**
  - **What is the alternate plan? (cutting alternate safety zone, emergency transport options, abandoning the other feller buncher?)**

## **Oregon Fire Scenario**

**As a HEQB, you are assigned a Type II dozer, a Type I Feller-Buncher, and a Type I skidder.**

### **Part 1**

It is August 21st and your first shift on the Dog Mountain fire, which has burned across the California line. You have been assigned to Division D on the south west section of the fire, in Modoc County, CA; you note that this part of the fire had substantial growth yesterday. The fire weather predictions given at the morning briefing included a red flag warning for low RH and winds in the afternoon of 10-15 mph from the north-west. At the division break-out, your DIVS assigns you 3 pieces of equipment, a type II dozer with transport, a type I feller-buncher and a type I rubber-tired skidder. He wants you to tie in with your equipment at the division staging area at DP 131, and then thin 2 miles of road 73, from DP 131 to the division break to the east. This road is approximately 3 miles south of the fire, and runs east-west. He envisions the dozer remaining in staging for now. The terrain is gentle, 0 to 5% grade, and rocky in spots; the area is forested with Ponderosa, Sub-Alpine Fir, and Juniper, with openings which have grass. He wants the fire side of the road to be thinned 60 feet deep, leaving as much Ponderosa as possible, with spacing greater than 30 feet.

**What are your thoughts concerning the assignment?**

10:00: After delays at the ICP and a long confusing drive on forest service roads you arrive at the staging area for Division D, DP 131 at the intersection of road 07 (Kellogg Road) and road 73 (County Highway. 73). You feel there is some confusion, because you don't see any of your assigned resources in the staging area, which is little more than a wide turn-out, and is already full with equipment which you discover is assigned to the neighboring division. You can hear your DIVS talking to the Operations Chief on the command frequency and understand his location is at the extreme north of the division, approximately 9 miles from your location; you doubt if you can hit him on the division tactical channel. He also sounds busy with structure protection problems.

**What actions do you take?**

## **Part 2**

**August 21st, 11:30:** After driving to other staging areas, you have found your assigned equipment at DP105, north of your division, on the west side of the fire. You have been watching fire activity increase and you are anxious to get to work on your assignment. You are leading the loaded feller-buncher, and the skidders down road 07 and are 5 miles north of drop point 131. Your loaded dozer has arrived at DP 131 and is waiting to tie in with you.

A TFLD stops you at a driveway intersection. This is the structure protection area your DIVS has been occupied with and you see a dense dark smoke column approximately 1 mile to your east. The TFLD wants to use your equipment to thin the driveway from road 07 east to the ranch structures, about ½ mile distance, both to improve firefighter egress and to potentially be used as a road to fire off of. He believes thinning the fire aside of the road 30 feet in will be adequate with 30 feet minimum spacing of remaining trees. Two hand crews and several engines are already down this driveway. You ask him to check with your DIVS, who immediately approves the plan. The DIVS also states that he knows of an available feller-buncher in Division B (he calls them timbcos, the TFLD calls them hot-saws); he received the okay to borrow it and wants to send your feller-buncher transport to retrieve it while your equipment starts working. You will then be managing it, using it with your feller-buncher and skidder on the ranch driveway which extends east from your location over gentle, slightly rocky terrain, and is treed with Ponderosa and Juniper.

**What are your thoughts concerning this new assignment?**

**What actions do you take?**

**Do you see any potential issues?**

**Do you have any feed-back for your DIVS?**



### **Part 3**

**August 21st, 12:30:** After unloading and a briefing, you have made approximately 1/4 mile of progress thinning 30' deep along the driveway, on the side of the approaching fire (future black). You have chosen to drag the bundles out the driveway and across the 07 road, where there is a flat, rocky area of approximately 30 acres, with minimal vegetation. The skidder has fallen behind the feller-buncher as the distance lengthens. The second feller-buncher hasn't arrived, but is due momentarily. You have heard your staged dozer calling you on the division tactical frequency, but he can't hear you answer back.

Fire activity is continuing to increase, so is communication on your tactical frequency. You hear your DIVS order 3 SEATS for structure protection. You see 2 medium bucket ships working to your east.

You think you hear one of the hand crews up the driveway having trouble with multiple spots across the driveway. You estimate he is 1/4 mile from you.

**What are your thoughts?**

**What actions do you take?**

## **Part 4**

**August 21st, 12:45:** Your 2nd feller-buncher has arrived and is still on the transport, you're holding him on the 07 road just north of the driveway intersection; he is blocking the road to the north, but you don't remember any turn-outs nearby. Some resources are coming out the ranch driveway, heading south on the 07 road. You have pulled your working feller-buncher back to the driveway intersection and you are deepening the thinning there while the skidder cleans up the bundles remaining along the ranch driveway. You haven't heard an order to fall back but you are preparing to do so because the mission of thinning the driveway seems unobtainable. You worry that you only have one transport for 2 feller-bunchers.

**What are your thoughts?**

**What actions do you take?**

## **Part 5**

**August 21st, 13:00:** You hear the DIVS order all resources off the line and into the safety zone, which is on the 07 road, 5 miles south of your location. As resources continue out the driveway, you acknowledge the order and advise him that you don't have a transport for one of the feller-bunchers. After a long pause he says he will come out and meet you for a face-to-face. While you are waiting, you prepare alternate plans that will allow for all your resources safety.

**What are your thoughts?**

**What actions do you take?**

**Will you have any feed-back for your DIVS?**



## **UNIT OVERVIEW**

**Course**      Heavy Equipment Boss, S-236

**Unit**          6 – All Hazard Assignments

**Time**          2 Hours

### **Objective**

1.      Discuss the impact of assignment diversion on the mission.
2.      Discuss roles and responsibilities involving working with all hazard teams.
3.      Identify indicators of behavioral changes related to critical stress on all hazard assignments.
4.      Discuss the Stafford Act and National Response Framework.
5.      Discuss preparations timeframes related to all hazard assignments.
6.      Identify eight (8) categories of hazards relating to situational awareness for all hazard assignments.

### **Strategy**

All Hazard assignments have become more common place; this unit covers the preparation, roles and responsibilities of a HEQB on an All Hazard assignment.

### **Instructional Methods**

- Informal lecture
- Classroom discussion
- Interactive group discussion

### **Instructional Aids**

- ☐    Flip chart with markers
- ☐    Personal computer with LCD projector and presentation software

### **Exercise(s)**

- None

## **Evaluation Methods**

- Student and class participation.
- Final Exam

## **Outline**

- I. Introduction to All Hazard Assignments
- II. Working with All hazard Teams (FEMA, Area Command, etc.)
- III. All hazard – Critical Incident Stress Management (CISM)
- IV. Stafford Act
- V. National Frameworks System (NFS)
- VI. Assignment Preparation
- VII. Situational Awareness for All Hazard Assignments
- VIII. All Hazard Equipment

## **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:** Heavy Equipment Boss, S-236

**Unit:** 6 – All Hazard Assignments

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>	Slide 6-1
<b>Present Unit Objectives.</b>	Slide 6-2 Slide 6-3
I. INTRODUCTION TO ALL HAZARD ASSIGNMENTS	Slide 6-4
<p>Your role as Heavy Equipment Boss on an all hazard assignment is to provide supervisory and administrative support for heavy equipment resources assigned to the incident.</p> <p>The responsibilities, processes, and procedures are similar to a wildland fire assignment, but the hazards, risks, and mitigations are usually different and may require assistance from technical specialists.</p>	Slide 6-5
A. Length of Assignments	Slide 6-6
<p>Length of assignments for all hazard assignments may last up to 30 days. Fatigue and stress may be outside the normal experiences you are accustomed to.</p> <p>Work/rest ratio (2-1) guidelines are the same as on a wildland fire incident. However 14 days on, and one day off, or 21 days on and two off may not be applicable on an all hazard assignment.</p>	

OUTLINE	AIDS & CUES
<p>When assigned to an all hazard incident discuss with your supervisor or Liaison Officer the need for a set 2-1 work/rest ratio.</p> <p>B. Assignment Diversion (Mission Creep)</p> <p>Assignment diversion, commonly known as mission creep is common in all hazard assignments. As a Heavy Equipment Boss you need to be aware of possible mission creep outside the scope of the mission assignment.</p> <p>Mission creep can have an unforeseen or hazardous effect on the overall mission by taking on duties that are not assigned on your mission statement.</p> <p>Example of mission creep:</p> <p>Your team is assigned to support the local fire department with their normal duties at a hurricane. All infrastructures ceased, including sanitation services.</p> <p>Mission creep: team personnel start assisting the sanitation department with trash disposal.</p> <p>Your assignment was to support the local fire department not dispose of trash. The safety related issues in this mission creep are that trash could contain toxic or hazardous material, and your team is not trained or equipped to do this job.</p>	<p>Slide 6-7</p> <p>Slide 6-8</p>



OUTLINE	AIDS & CUES
<p data-bbox="203 281 967 359">II. WORKING WITH ALL HAZARD TEAMS (FEMA, AREA COMMAND, ETC.)</p> <p data-bbox="298 409 1047 575">All hazard assignments usually include working in an expanded interagency team atmosphere with various all hazard response agencies and technical specialists you do not normally work with.</p> <p data-bbox="298 625 1052 747">Stress levels may be elevated and interpretation of the incident command system may be different from what you are accustomed to.</p> <p data-bbox="298 798 1039 963">An example is that all hazard teams may have specialized search and rescue, or hazmat clean up units that use equipment and terminology you may not be familiar with.</p> <p data-bbox="298 1014 634 1045">A. Communication</p> <p data-bbox="396 1096 639 1127">1. Radio use</p> <p data-bbox="492 1178 1003 1472">You may be communicating with various outside agencies that are unfamiliar with wildfire radio protocol. They may use their own agency, regional, or cultural terminology. It is vital to use clear text. Do not use acronyms.</p> <p data-bbox="492 1522 1036 1772">Follow the Communication plan and ensure that equipment operators assigned to you are familiar with frequency management and emergency communication procedures.</p>	<p data-bbox="1079 281 1218 315">Slide 6-9</p> <p data-bbox="1079 409 1235 443">Slide 6-10</p> <p data-bbox="1079 798 1230 831">Slide 6-11</p> <p data-bbox="1079 1014 1235 1047">Slide 6-12</p> <p data-bbox="1079 1522 1235 1556">Slide 6-13</p>

OUTLINE	AIDS & CUES
<p>2. Roles and responsibilities</p> <p>Responding agencies may have different roles, responsibilities, policies, and procedures. It is important to start a dialog to blend responsibilities so there is a common understanding.</p> <p>The ability to understand cultural differences, language, and terminology is an essential part of communication. You must be aware of cultural differences to accomplish the mission.</p>	<p>Slide 6-14</p> <p>Slide 6-15</p>
<p>B. Information Requests</p> <p>As a Heavy Equipment Boss you may be requested by your supervisor to provide specific information for statistical purposes.</p> <p>Be sure to have a clear understanding of the type of information being requested and who needs to receive it. Check the Assignment List, ICS 204 for specific requirements.</p> <p>For example, Federal Emergency Management Agency (FEMA) may require specific statistics on non-industrial hazardous materials discovered as a result of a search and rescue mission.</p>	<p>Slide 6-16</p> <p>Slide 6-17</p>

OUTLINE	AIDS & CUES
<p>III. ALL HAZARD – CRITICAL INCIDENT STRESS MANAGEMENT (CISM)</p> <p>Critical stress can have serious short-term and long-term effects. The ability to identify situations that may cause critical stress is paramount to manage and minimizing its effects.</p> <p>A. Stress</p> <p>All responders to the incident may be exposed to stressful situations that include isolation, death, disease, devastation, etc. that will affect each individual in a different way.</p> <p>Patience and sensitivity of the situation is extremely important.</p> <p>Stress levels may also be very high with local agencies that have been affected by the disaster.</p> <p>Being aware of what incident support is available and how to access it is important.</p> <p>B. Taking Care of Yourself</p> <p>Being put into a disaster situation that includes property destruction, and suffering on a mass scale is outside the scope of normal stress management. Often you are the last one to see a change in your behavior.</p>	<p>Slide 6-18</p> <p>Slide 6-19</p> <p>Slide 6-20</p> <p>Slide 6-21</p> <p>Slide 6-22</p>

OUTLINE	AIDS & CUES
<p>You are not immune to human suffering and stress, it is important to step back, take time to assess your physical and mental condition. You need to be able to identify trigger points in your behavior and seek help as needed.</p>	<p>Slide 6-23</p>
<p>C. Take Care of the Team</p> <p>Some all hazard incident management teams (IMTs) will have assigned to the command staff a Crisis Incident Stress Manager (CISM).</p>	<p>Slide 6-24</p>
<ul style="list-style-type: none"> <li>• Look at team interactions, process, and procedures; note any unusual behaviors due to high stress situations. <ul style="list-style-type: none"> <li>– Behavior is out of character.</li> <li>– Dysfunctional team interaction.</li> <li>– Not following process.</li> <li>– Group think can be a result of behavioral changes.</li> </ul> </li> </ul>	<p>Slide 6-25</p>
<p>Notify your supervisor if you observe out of the ordinary behavior, monitor the situation, and follow-up accordingly.</p>	<p>Slide 6-26</p>

OUTLINE	AIDS & CUES
<p>IV. STAFFORD ACT</p> <p>Federal support to States and local jurisdictions takes many forms. The most widely known authority under which assistance is provided for major incidents is the Stafford Act.</p> <p>When an incident occurs that exceeds or is anticipated to exceed local, tribal, or State resources, the Governor can request Federal assistance under the Stafford Act.</p> <p>The Stafford Act authorizes the President to provide financial and other assistance.</p>	<p>Slide 6-27</p> <p>Slide 6-28</p> <p>Slide 6-29</p>
<p>V. NATIONAL FRAMEWORKS SYSTEM (NFS)</p> <p>The NFS presents the guiding principles that enable all response partners to prepare for and provide a unified national response.</p> <p>The National Response Framework overview document was developed for emergency management practitioners as an overview of the process, roles, and responsibilities for requesting and providing all forms of Federal assistance.</p> <ul style="list-style-type: none"> <li>• Mission Assignment</li> </ul> <p>FEMA may issue mission assignments to other Federal agencies.</p> <p>A mission assignment is very similar to a Resource Order. The difference being, a mission assignment gives you specific tasks to do, whereas a resource order assigns you to an overall incident in a qualified position.</p>	<p>Slide 6-30</p> <p>Slide 6-31</p> <p>Slide 6-32</p> <p>Slide 6-33</p> <p>Slide 6-34</p>

OUTLINE	AIDS & CUES
<p>It is important to follow the mission assignment and avoid mission creep.</p>	
<p>VI. ASSIGNMENT PREPARATION</p>	<p>Slide 6-35</p>
<p>A. Preplanning</p>	<p>Slide 6-36</p>
<p>All hazard response presents some of the most difficult and complex management challenges that our agencies face.</p>	
<p>In some cases training may be provided at the incident and may include HazMat Awareness and Operations. Work with your agency to ensure you have the required trainings for the assignment. If possible try to take IS-800.B online through the FEMA website.</p>	<p>Slide 6-37</p>
<p>Potential incidents include:</p> <ul style="list-style-type: none"> <li>• Hurricanes</li> <li>• Floods</li> <li>• Animal disease outbreaks</li> <li>• Terrorist attacks</li> <li>• Search and rescue operations</li> <li>• Large hazardous material releases</li> </ul>	<p>Slide 6-38</p>

OUTLINE	AIDS & CUES
<p>Examples of assigned tasks in mission assignments for agency personnel may include management of:</p> <ul style="list-style-type: none"> <li>• Logistical distribution centers</li> <li>• Staging areas</li> <li>• Base camps for emergency responders</li> <li>• Clearing roadways and debris</li> <li>• Support for wildfire or structural fire suppression</li> </ul>	Slide 6-39
<p><b>TIP</b>  <b>More information can be gathered at the following website: <a href="http://www.fs.fed.us/r8/allhazardresponse">www.fs.fed.us/r8/allhazardresponse</a></b></p>	
<p>Preplanning for an all hazard assignment is essential. If you are willing to accept all hazard assignments long range preparations may include passports, vaccinations, and research.</p>	Slide 6-40
<ul style="list-style-type: none"> <li>• Prepare for all hazard assignments at least six months in advance.</li> <li>• Obtaining Government passports requires approximately three months.</li> </ul>	Slide 6-41
<p><b>TIP</b>  <b>If you have a personal passport it will shorten the wait period for a Government passport.</b></p>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Vaccinations vary depending upon the area of the world you are going to and may require booster shots.</li> </ul> <div data-bbox="207 457 1052 814" style="border: 2px solid black; padding: 10px;"> <p><b>TIPS</b>  <b>More information on vaccinations can be found at the following website:</b>  <a href="http://www.cdc.gov/">www.cdc.gov/</a></p> <p><b>Vaccination records from the military or any other foreign travel may help reduce the number of required vaccinations.</b></p> </div> <p>B. Understanding the Geographic Area and Mission Assignment</p> <p>Where am I going? What am I going to?  How am I going to operate in that environment?</p> <p>Internet and technical specialists are very good resources to help prepare for some of the cultural differences you may encounter on an all hazard assignment, in or out of the country.</p>	<p>Slide 6-42</p> <p>Slide 6-43</p>



OUTLINE	AIDS & CUES
VII. SITUATIONAL AWARENESS FOR ALL HAZARD ASSIGNMENTS	Slide 6-44
A. Culture <ul style="list-style-type: none"> <li>• Local customs</li> <li>• Language</li> <li>• Religious beliefs <ul style="list-style-type: none"> <li>– Religious practices may affect work schedules.</li> </ul> </li> <li>• Perceptions <ul style="list-style-type: none"> <li>– Can go both ways</li> <li>– Bias can influence decision making</li> </ul> </li> </ul>	Slide 6-45
B. Hazards <ul style="list-style-type: none"> <li>• Environmental <ul style="list-style-type: none"> <li>– Disaster aftermath</li> <li>– Downed vegetation</li> <li>– Water</li> <li>– Topography</li> <li>– Urban interface (septic tanks, power lines, animals, etc.)</li> </ul> </li> </ul>	Slide 6-46

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Weather <ul style="list-style-type: none"> <li>○ Wet/cold – extremes</li> <li>○ Disaster reoccurrence</li> <li>○ Heat index</li> <li>○ Mud – Slides/avalanche</li> <li>○ Floods</li> <li>○ Wind events</li> </ul> </li> <li>– Animal/reptile</li> </ul> <div data-bbox="207 966 1052 1537" style="border: 2px solid black; padding: 10px; margin: 10px 0;"> <p><b>TIPS</b></p> <p><b>Hantavirus pulmonary syndrome (HPS) is a rare but deadly viral infection. It is spread by mice and rats. They shed the virus in their urine, droppings and saliva. Tiny droplets with the virus can enter the air. People can get the disease if they breathe infected air or come into contact with rodents or their urine or droppings. You cannot catch it from people.</b></p> <p><b>Remember to use the PPE required by the incident for protection from hazards.</b></p> </div> <ul style="list-style-type: none"> <li>– Insects</li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Infrastructure</li> </ul> <div style="border: 2px solid black; padding: 5px; margin: 10px 0;"> <p><b>TIP</b>  <b>Be prepared to work in an environment where you do not have access to technology.</b></p> </div> <ul style="list-style-type: none"> <li>– Gas leaks</li> <li>– Lack of sanitation</li> <li>– Raw sewage</li> <li>– Water system (lack of or contamination)</li> <li>– Transportation (e.g., road/bridge) systems</li> <li>– Power lines</li> <li>– Lack of telephone/data</li> <li>– Structural fire protection</li> <li>– Structural damage (toxic gases or weakened structural integrity)</li> <li>– Dam integrity</li> <li>– Medical facilities (biohazard and radiation)</li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Biological <ul style="list-style-type: none"> <li>– Mold and mildew</li> <li>– Pathogens/pandemic</li> <li>– Viral/bacterial</li> <li>– Manmade/natural</li> <li>– Hazmat</li> <li>– Toxic plants</li> </ul> </li> <li>• Chemical <ul style="list-style-type: none"> <li>– Spills</li> <li>– Aerosols</li> <li>– Contact <ul style="list-style-type: none"> <li>○ Asbestos</li> <li>○ Poly carbons</li> </ul> </li> </ul> </li> <li>• Radiological <ul style="list-style-type: none"> <li>– Nuclear waste</li> <li>– Military</li> <li>– Medical facilities</li> </ul> </li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Explosive <ul style="list-style-type: none"> <li>– Unexploded ordinance <ul style="list-style-type: none"> <li>○ Personal defense stockpiles (personal reloading equipment)</li> <li>○ Military</li> </ul> </li> <li>– Time sequential explosives/secondary devices</li> <li>– Suicide bombers/terrorism</li> <li>– Gas/oil wells</li> <li>– Pipe bombs</li> <li>– Flammable compressed gas (e.g., propane, acetylene, oxygen, etc.)</li> <li>– Other (chemicals)</li> </ul> </li> <li>• Human <ul style="list-style-type: none"> <li>– Drug trafficking</li> <li>– Unstable individuals (altered stated due to effects of disaster)</li> <li>– Human trafficking</li> <li>– Unauthorized personnel</li> </ul> </li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Criminal activity</li> <li>– Fatalities</li> </ul>	
<p>C. Transportation</p> <ul style="list-style-type: none"> <li>• Other agencies involved (requirements and policies may vary)</li> <li>• Navigation (egress, congestion, unidentifiable area, etc.)</li> <li>• Communication system and coverage</li> </ul>	Slide 6-47
<p>D. Personal Safety and Security</p> <ul style="list-style-type: none"> <li>• Anti-government</li> <li>• Gang activity</li> <li>• Criminal activity</li> <li>• Looting</li> <li>• Evacuation plan</li> </ul>	Slide 6-48
<ul style="list-style-type: none"> <li>• Base camp security</li> <li>• Staging area security</li> <li>• Site safety plan</li> <li>• Incident emergency plan</li> </ul>	Slide 6-49



OUTLINE	AIDS & CUES
<p>Some examples of unique hazardous material equipment:</p> <ul style="list-style-type: none"> <li>• Refrigeration truck (anhydrous ammonia)</li> <li>• Cryogenic hazmat trucks</li> </ul>	<p>Slide 6-54</p>
<p><b>Review Unit Objectives.</b></p>	<p>Slide 6-55 Slide 6-56</p>
<p><b>Administer final exam to students.</b></p> <p><b>Instructions:</b></p> <ul style="list-style-type: none"> <li>• Review unit objectives with students.</li> <li>• Ask if there are any questions.</li> <li>• Hand out final exam (exam and answer key can be found in Appendix C).</li> <li>• Allow 1 hour for students to take final exam.</li> <li>• Students must pass with at least 70% to receive a certification for the course.</li> <li>• Students may reference IRPG, Wildland Fire Incident Management Field Guide, and calculators for the final exam.</li> </ul>	