

# Helicopter Crewmember S-271



NFES 001496

**Instructor Guide**  
**DECEMBER 2010**



## 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:*

Helicopter Crewmember, S-271  
Certified at Level I

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

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Date Dec 14, 2010

Date 12-7-2010

# Helicopter Crewmember

## S-271

**Instructor Guide**  
**DECEMBER 2010**  
**NFES 001496**

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Comments regarding the content of this publication should be directed to:  
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E-mail: [nwcg\\_evaluation@nifc.blm.gov](mailto:nwcg_evaluation@nifc.blm.gov)

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Additional copies of this publication may be ordered from National Interagency Fire Center,  
ATTN: Great Basin Cache Supply Office, 3833 South Development Avenue, Boise, Idaho 83705.  
Order publication number: NFES 001496.

## **NWCG TRAINING WORKING TEAM POSITION ON COURSE PRESENTATION AND MATERIALS**

The recommended hours listed in the FMCG are developed by Subject Matter Experts based on their estimation of the time required to present all material needed to adequately teach the unit and course objectives. The hours listed may vary slightly due to factors such as number of students, types and complexity of course activities, and the addition of local materials. NWCG does not approve of course delivery varying greatly from the recommended course hours. Instructors and students are cautioned that in order to be recognized as an NWCG certified course, certain guidelines must be followed:

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

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

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

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

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

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

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

## **PREFACE**

Helicopter Crewmember, S-271 is a required training course in the National Wildfire Coordinating Group (NWCG) wildland and prescribed fire curriculum. It was developed by an interagency group of experts with guidance from NWCG Training under authority of the NWCG. The primary participants in this development effort were:

### **U.S. FOREST SERVICE**

David M. Redman, Caribou Targhee National Forest  
Eastern Idaho Interagency Fire Center

**NATIONAL INTERAGENCY FIRE CENTER, FIRE TRAINING  
NWCG Development Unit, Evaluation Unit, and Instructional Media Unit**

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



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## COURSE INSTRUCTIONS

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

### I. INTRODUCTION

The S-271, Helicopter Crewmember course requires 40 hours for presentation. This course is designed to meet the training needs of a Helicopter Crewmember (HECM) on an incident as outlined in the Wildland Fire Qualification System Guide (PMS 310-1) and the position task book developed for the position.

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

The publication “Interagency Helicopter Operations Guide (IHOG)”, NFES 1885, is required for presentation of this course. Instructors will refer to the IHOG in conjunction with this instructor guide to meet course objectives. Students will use the IHOG in conjunction with the student workbook. The IHOG provides guidance, safety and direction for helicopter operations. As the IHOG is revised, utilize the most current version.

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

The course is designed to be interactive in nature. It contains exercises designed to facilitate group and class discussion. The instructor cadre must be familiar with the course instructions and exercises. The course units and lessons provide introduction to the different types of aircraft, planning, risk management, safety and communications.

While lead instructors are encouraged to enhance course materials to reflect conditions, resources, and policies of the local unit, they must ensure that objectives of the course and each unit are not compromised. Test questions may be added to reflect any local information that may have been added to the course. However, test questions in the certified course materials cannot be deleted to ensure accurate testing of the course and unit objectives.

Completion of the S-271 course meets the recommended equivalency skill courses for additional interagency aviation position prerequisites. The following Interagency Aviation Training (IAT) A-courses curriculums are intergraded and are credited upon completion of this course:

A-105 – Aviation Life Support Equipment (ALSE)

A-110 – Aviation Transportation of Hazardous Material

A-113 – Crash Survival

A-219 - Helicopter Transport of External Cargo

## II. COURSE OBJECTIVES

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

- Upon completion of this course, the student will be able to demonstrate proficiency in all identified areas of helicopter use to safely achieve efficiency and standardization.

## III. INSTRUCTOR PREREQUISITES

The lead instructor must be knowledgeable in the use of aviation resources in wildland fire suppression, agency aviation policy, and Federal Aviation Regulations.

This is a 200 level course. Refer to the Field Manager’s Course Guide (FMCG), PMS 901-1 for instructor prerequisites specific to this course. The guide is accessible at <http://www.nwcg.gov/pms/training/training.htm>.

#### IV. INSTRUCTOR PREPARATION

The material in this course is designed to be presented through a series of facilitated discussions and classroom exercises. Instructors must devote adequate time for their presentations and should draw from their experiences to add realism and credibility to the information provided.

The exercises are designed to demonstrate the student's ability to meet the objectives for each unit. The instructors must work through the exercises together and agree upon the solutions.

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

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

#### V. COURSE MATERIALS

See Appendix A for course ordering and support information.

##### A. Instructor Guide

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

Each instructional unit has a unit overview that outlines the lesson's approximate delivery time, objectives, learning strategy, instructional methods, required materials, and evaluation criteria.

The technical content for each unit is written in outline format and is listed in the "Outline" column. This column also contains notes to the instructor (directions for conducting an exercise, questions to ask students, etc.) which are in a BOX and BOLDED.

The “Aids & Cues” column lists references (slide numbers, publications, handouts) that remind instructors to display or refer to specific materials.

B. Course Materials CD-ROM

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

C. Student Workbook

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

D. Interagency Helicopter Operations Guide (IHOG)

A copy of the IHOG publication should be available for reference to students during the class.

E. Agenda

A sample agenda is located at the end of this course introduction. It is suggested that the timeframes be removed from the agenda which is handed out to students. The agenda can be inserted into the student workbook prior to the beginning of the class.

F. Helicopter

If available, a helicopter is suggested for the hands-on field exercises. It is beneficial to the students and gives them the experience and knowledge of working with an actual helicopter.

## VI. STUDENT TARGET GROUP

This course is required training for all personnel desiring to be qualified as a Helicopter Crewmember (HECM).

## VII. STUDENT PREREQUISITES

Non-fire personnel:       None  
Fire personnel:           Satisfactory performance as a Firefighter Type 2

## VIII. STUDENT PRE-COURSE WORK

There is no student pre-course work.

## IX. COURSE SELECTION LETTER

An example of the course selection letter is located at the end of this introduction section. This letter will explain time frames for class start time, class location, etc.

For more information on selection letters, refer to the Course Coordinator's Guide (PMS 907).

## X. CADRE MEETINGS

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

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

## XI. RECOMMENDED CLASS SIZE

In order to facilitate group exercises, it is recommended that instructors maintain a maximum 5:1 ratio of students to instructors. This is to enable strong mentorship by the cadre to the students. Suggested maximum class size is 30 students.

## XII. SPACE AND CLASSROOM REQUIREMENTS

The classroom should be chosen and viewed well in advance of the presentation. The choice should be based on, but not limited to, the following characteristics:

- Provide adequate area for students and equipment.
- Be free from outside interruptions and interferences.
- Have controlled lighting, good acoustics, and good ventilation.
- Have supportive facilities such as break areas, restrooms, etc.

Refer to the Course Coordinators Guide (PMS 907) for more information.

## XIII. EXAMINATION AND CERTIFICATION

Students must obtain 70% or higher on the final exam to receive a certificate of completion for this course.

## XIV. COURSE EVALUATION FORMS

The evaluation forms are located in Appendix D.

### A. Unit and Student Training Course Evaluation Forms

This is an opportunity for students to comment on the course and the instructors for the purpose of improving future training sessions. These forms are NOT to be sent to the NWCG Evaluation Unit.

### B. Training Course Evaluation Form

This form allows the course coordinator and instructor cadre to comment on course content for input into the Development Unit database for future revisions. If common major problems exist, the course can be prioritized on the revision schedule as a critical need from these field comments.

## XV. APPENDIXES

**The following appendixes are on the S-271 Course Materials CD-ROM:**

- A. Appendix A – Course Ordering and Support Information
- B. Appendix B – PowerPoint Presentations
- C. Appendix C – Handouts
- D. Appendix D – Final Exam, Quizzes and Final Answer Keys
- E. Appendix E – Course Evaluation Forms

## **HELICOPTER CREWMEMBER, S-271 SELECTION LETTER EXAMPLE**

Congratulations on being selected to attend Helicopter Crewmember, S-271 to be held at (*location*). The course will begin at (*time, date*), and end at (*time, date*).

The primary emphasis of this course will be to prepare individuals wishing to be qualified as a Helicopter Crewmember (HECM).

Bring the following items to class:

- Incident Response Pocket Guide, NFES 1077
- Fireline Handbook, NFES 0065
- Personal Protective Equipment (PPE) for field exercises

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

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

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

**HELICOPTER CREWMEMBER, S-271  
SAMPLE AGENDA**

Day 1

0800 Unit 0 – Introduction  
0830 Unit 1 – Readiness  
1000 Unit 2 – Effective Working Relationships  
1200 Lunch  
1300 Unit 2 – Effective Working Relationships, (cont.)  
1500 Unit 3 – ICS Concepts and Principles  
1700 Daily Review/Cadre Meeting

Day 2

0800 Unit 4 – Communications  
1000 Unit 5 – Helicopter Performance, Limitations, and Load Calculations  
1200 Lunch  
1300 Unit 5 – Helicopter Performance, Limitations, and Load Calculations cont.  
1500 Unit 6 – Risk Management  
1700 Daily Review/Cadre Meeting

Day 3

0800 Unit 7 – Operational Safety  
1200 Lunch  
1300 Unit 7 – Operational Safety cont.  
1700 Daily Review/Cadre Meeting

Day 4

0800 Unit 8 – Helispot Operations  
1000 Unit 9 – Demobilization  
1200 Lunch  
1300 Final Examination  
1500 Field Exercise Information  
1700 Daily Review/Cadre Meeting

Day 5

0800 Field Exercise  
1700 Evaluation/Cadre Close Out

## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 0 – Introduction

**Time** 1 Hour

### Objectives

1. Introduce the course coordinator, instructor, and students.
2. Review and discuss course logistics.
3. Present and go over the course overview.
4. Review and discuss instructor and student course expectations.
5. Identify the course references and essential materials.
6. Review and discuss the position responsibilities.

### Strategy

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

### Instructional Methods

- Informal lecture
- Classroom discussion
- Interactive group discussion

### Instructional Aids

- Computer with LCD projector, presentation software, and screen
- Sign-in sheet
- Flip charts and markers
- Task Book
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)

### Exercise

- Student Expectations for the Course

## **Evaluation Method**

- None

## **Outline**

- I. Introductions
- II. Course Logistics
- III. Course Overview
- IV. Course Expectations
- V. Course Reference Materials
- VI. Helicopter Crewmember Position

## **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: Helicopter Crewmember, S-271

UNIT: 0 – Introduction

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

OUTLINE	AIDS & CUES
<p data-bbox="201 281 646 317">II. COURSE LOGISTICS</p> <div data-bbox="207 369 1052 428" style="border: 2px solid black; padding: 2px;"><b>Discuss as appropriate:</b></div> <ul data-bbox="302 474 1040 1493" style="list-style-type: none"><li data-bbox="302 474 618 510">• Course agenda</li><li data-bbox="302 558 594 594">• Sign-in sheet</li><li data-bbox="302 642 610 678">• Housekeeping<ul data-bbox="394 726 1040 1409" style="list-style-type: none"><li data-bbox="394 726 967 762">– Message and telephone location</li><li data-bbox="394 810 756 846">– Cell phone policy</li><li data-bbox="394 894 1040 1062">– Facility locations (restrooms, vending machines, drinking fountains, smoking areas, evacuation policy, etc.)</li><li data-bbox="394 1110 1032 1188">– Local information (restaurants, local map, transportation)</li><li data-bbox="394 1236 1000 1314">– Computer use (no internet surfing, log on only when instructed, etc.)</li><li data-bbox="394 1362 935 1398">– Punctuality, meals and breaks</li></ul></li><li data-bbox="302 1451 618 1486">• Other concerns</li></ul> <div data-bbox="207 1545 1052 1640" style="border: 2px solid black; padding: 2px;"><b>Circulate the class registration form or a sign-in sheet for students to sign.</b></div>	<p data-bbox="1081 281 1214 317">Slide 0-5</p>

OUTLINE	AIDS & CUES
<p>III. COURSE OVERVIEW</p> <p>This course is designed to meet the training needs of a Helicopter Crewmember (HECM) as outlined in the Wildland Fire Qualifications System Guide (PMS 310-1) and the position task book developed for the position.</p> <p>A. Course Objective</p> <p>Upon completion of this course, the student will be able to demonstrate proficiency in all identified areas of helicopter use to safely achieve efficiency and standardization.</p> <p>B. Instructional Methods</p> <ol style="list-style-type: none"> <li>1. Facilitation/short lectures with PowerPoint</li> <li>2. Discussion</li> <li>3. Exercises</li> <li>4. Hands-on</li> </ol> <p>C. Student Assessment/Evaluation</p> <p>To successfully complete the course, students must:</p> <ol style="list-style-type: none"> <li>1. Participate in all classroom discussions, exercises, and scenarios.</li> <li>2. Complete all quizzes.</li> </ol>	<p>Slide 0-6</p> <p>Slide 0-7</p> <p>Slide 0-8</p>

OUTLINE	AIDS & CUES
<p>3. Achieve 70% or higher on the final assessment/scenario.</p> <p>D. Course Evaluation Form</p> <p>Students are given the opportunity to comment on the course and the quality of the instruction.</p>	<p>Slide 0-9</p>
<p>IV. COURSE EXPECTATIONS</p> <p>A. Student Expectations</p> <p><b>EXERCISE: Expectations</b></p> <p><u>Purpose:</u> Student develops a list of their expectations for the course.</p> <p><u>Time:</u> 10 minutes</p> <p><u>Format:</u> Students work in small groups of 3 to 5</p> <p><u>Materials Needed:</u> Flip charts, markers</p> <p><u>Instructions:</u></p> <ol style="list-style-type: none"> <li>1. Instruct groups to write their responses to the following question on a flip chart: <ul style="list-style-type: none"> <li>• What do you expect to gain from this course?</li> </ul> </li> <li>2. When finished, have each group present their expectations to the class.</li> <li>3. Answer any questions.</li> </ol>	<p>Slide 0-10</p>

OUTLINE	AIDS & CUES
<p>4. Post lists around the room and refer to them throughout the course to ensure students' expectations are being met.</p>	
<p><b><u>End of Exercise.</u></b></p>	
<p>B. Instructor Expectations</p> <p>Students will:</p> <ul style="list-style-type: none"> <li>• Have an interest in becoming a Helicopter Crewmember (HECM).</li> <li>• Exhibit mutual cooperation with the group.</li> <li>• Be open-minded to accomplishments during the course presentation.</li> <li>• Participate actively in all of the training exercises presented in the course.</li> </ul>	<p>Slide 0-11</p>
<ul style="list-style-type: none"> <li>• Return to class at stated times.</li> <li>• Use what is presented in the course to effectively perform the duties of a HECM.</li> <li>• Not leave the course with any unanswered questions.</li> </ul>	<p>Slide 0-12</p>

OUTLINE	AIDS & CUES
<p>V. 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 (IRPG), PMS 461</li> <li>• Interagency Helicopter Operations Guide (IHOG), NFES 1885</li> <li>• Interagency Aviation Transport of Hazardous Materials, NFES 1068</li> </ul>	<p>Slide 0-13</p>
<p>VI. HELICOPTER CREWMEMBER POSITION</p> <p>A. The Helicopter Crewmember in the Incident Command System</p> <ul style="list-style-type: none"> <li>• The HECM is a designated member of an Incident Management organization.</li> <li>• The HECM is supervised by the Helicopter Manager (HMGB), Air Operations section of the Incident Management organization.</li> </ul>	<p>Slide 0-14</p>

OUTLINE	AIDS & CUES
<p data-bbox="298 283 976 321">B. Position Task Book (PTB) Description</p> <div data-bbox="207 369 1052 470" style="border: 2px solid black; padding: 5px;"> <p data-bbox="220 380 967 457"><b>Briefly explain the purpose of the position task book.</b></p> </div> <p data-bbox="393 518 985 596">The PTB contains common tasks and additional specific tasks for the HECM.</p> <p data-bbox="393 644 1023 722">The PTB is the primary tool for observing and evaluating performance.</p> <p data-bbox="393 770 1008 894">In the current performance based system, trainees must complete the tasking in the PTB to become qualified as a HECM.</p> <p data-bbox="393 942 1044 1020">This PTB can only be initiated by the home unit, not at this course.</p> <div data-bbox="207 1073 1052 1173" style="border: 2px solid black; padding: 5px;"> <p data-bbox="220 1083 1034 1161"><b>Ask students if they have any questions concerning the FHB or PTB.</b></p> </div>	<p data-bbox="1081 283 1235 321">Slide 0-15</p>
<p data-bbox="298 1220 610 1257">C. HECM Duties</p> <div data-bbox="207 1306 1052 1407" style="border: 2px solid black; padding: 5px;"> <p data-bbox="220 1316 1023 1394"><b>Briefly review the HECM duties. They are discussed in detail throughout the course (review).</b></p> </div> <p data-bbox="393 1455 1031 1705">The Helicopter Crewmember (HECM) for both Fire and Resource Exclusive-Use and Call-When-Needed (CWN) serves as a trained member of a helicopter crew, assisting the Manager in the performance and completion of helicopter missions.</p>	<p data-bbox="1081 1220 1235 1257">Slide 0-16</p>
<div data-bbox="207 1753 1052 1812" style="border: 2px solid black; padding: 5px;"> <p data-bbox="220 1764 716 1801"><b>Address questions or concerns.</b></p> </div>	<p data-bbox="1081 1759 1235 1797">Slide 0-17</p>



## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 1 – Readiness

**Time** 1 Hour

### Objectives

1. Describe information and material needed for assignment.
2. Describe the information that is needed from dispatch when assigned to an incident.
3. Describe the check-in process upon arrival at the incident.
4. Describe the information gathered from the assigned supervisor at the incident.

### Strategy

This unit will help students to understand the policies and procedures associated with accepting an assignment and checking in at the assignment. This will be done through lecture and student interaction.

### Instructional Methods

- Facilitation/informal lecture with PowerPoint
- Group exercise

### Instructional Aids

- Computer with LCD projector and presentation software
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)
- PPE (Flight helmet, Nomex gloves, etc.)
- Aviation Life Support Equipment (ALSE) Handbook
- DVD – Personal Protective Equipment (14:23 minutes)
- Personal Floatation Device (PFD)
- Incident Action Plan (IAP)
- Federal Aviation Regulations (FAR)

## **Exercise**

- None

## **Evaluation Method**

- Unit 1 quiz – HO-1-2

## **Outline**

- I. The Helicopter Crewmember
- II. Aviation Life Support and Survival
- III. Readiness for Assignment
- IV. Assignment Information
- V. Check-in Process
- VI. Initial Briefing

## **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



OUTLINE	AIDS & CUES
<p>II. AVIATION LIFE SUPPORT AND SURVIVAL</p> <p>A. Aviation Life Support Equipment (ALSE)</p> <p><b>View the “Personal Protective Equipment Video”</b></p> <p>The ALSE handbook provides policy and responsibilities requirements.</p> <ol style="list-style-type: none"> <li>1. Policy <p>Policy states that, the responsibility of management is to “provide employees with a safe and healthful work environment.”</p> </li> <li>2. Agency Responsibilities <p>Agencies are responsible for implementing their PPE program. They are also responsible for evaluating aviation activities and providing employees with the appropriate equipment and training.</p> </li> <li>3. Why Personal Protective Equipment (PPE)</li> </ol> <p><b>Ask students why they need PPE? Lead into the following accident synopsis.</b></p>	<p>DVD</p> <p>Slide 1-5</p> <p>Slide 1-6</p> <p>Slide 1-7</p>

OUTLINE	AIDS & CUES
<p>This accident occurred on August 3, 2000. The helicopter was destroyed when it abruptly rolled to the right and impacted terrain during hover after takeoff at Montello, Nevada.</p>	
<p>The helicopter was providing support of wildland firefighting activities and taking off with two passengers on board. The pilot “picked the helicopter up” to a 3 foot hover height and glanced down at the engine torque gauge. Suddenly, the helicopter did a “violent snap roll” to the right coming to rest upright. He estimated the whole event lasted about a ¼ second.</p>	Slide 1-8
<p>During the roll sequence, the main rotor blades entered the front cabin area and impacted the left front seat passenger on the head.</p>	Slide 1-9
<p>The flight helmet received substantial damage. The integrity of the outer shell was maintained, while the inner Styrofoam liner received substantial indentations absorbing most of the impact.</p>	
<p>Although the passenger was seriously injured, the flight helmet saved his life.</p>	Slide 1-10

OUTLINE	AIDS & CUES
<p>An aviator's flight helmet can save your life if properly fitted. The following topics within this unit will cover proper fitting and care of the primary element of PPE that should be worn during special use activities.</p> <p>B. Care and Fitting of your PPE</p> <p>Prior to dispatch or flight missions all helicopter crewmembers and passengers are required to wear the following PPE:</p> <ul style="list-style-type: none"> <li>• Nomex clothing (fire resistant clothing)</li> <li>• Nomex flight gloves (fire resistant or leather gloves)</li> <li>• Leather Boots (8" tops)</li> <li>• Flight helmet</li> </ul> <p>Be sure PPE is readily available in preparation for an assignment.</p> <p>1. Fire Resistant Clothing</p> <p>The purpose of wearing fire resistant clothing is to protect you from a flash fire. The preferred material is Nomex.</p> <ul style="list-style-type: none"> <li>• Clothing must be kept clean – do not use starch.</li> </ul>	<p>Slide 1-11</p>
<p>1. Fire Resistant Clothing</p> <p>The purpose of wearing fire resistant clothing is to protect you from a flash fire. The preferred material is Nomex.</p> <ul style="list-style-type: none"> <li>• Clothing must be kept clean – do not use starch.</li> </ul>	<p>Slide 1-12</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Clothing worn over Nomex (Coats, sweatshirts, coveralls, etc.) should be made of a fire resistant material. Natural fibers such as wool, cotton, or leather are best.</li> <li>• To provide adequate protection, under garments worn next to skin should also be made of fire resistant material or natural fibers.</li> </ul> <p style="border: 2px solid black; padding: 5px;"><b>Emphasize the need to wear natural fiber clothing as outerwear and underwear.</b></p> <p style="border: 2px solid black; padding: 5px;"><b>Describe the effects of synthetic clothing when exposed to flames.</b></p> <p>Chemically altered clothing is acceptable as fire resistant, and chemically treated is not. This is due to the fact that the chemical treatment will launder out and will no longer provide protection.</p> <p>2. Flight Suit</p> <ul style="list-style-type: none"> <li>• Should fit loosely to provide trapped air for insulation.</li> <li>• Sleeves should be long enough to reach first knuckle of thumb.</li> <li>• Pant legs should reach the floor while standing.</li> </ul>	<p>Slide 1-13</p>

OUTLINE	AIDS & CUES
<p>3. Gloves</p> <ul style="list-style-type: none"> <li>• Gloves should have a long cuff extending above the wrist.</li> <li>• Gloves should fit under a snugly secured flight suit sleeve cuff.</li> <li>• Gloves should fit snugly to provide for dexterity.</li> </ul>	<p>Slide 1-14</p>
<p><b>Ask for a volunteer to demonstrate the proper fitting of flight suit and gloves.</b></p>	
<p>4. Boots</p> <ul style="list-style-type: none"> <li>• Boots made of all leather. (No nylon, canvas, etc.)</li> <li>• Flight suit should fit snugly over the tops of the boot around the ankles.</li> </ul>	<p>Slide 1-15</p>
<p>5. Head, Hearing, and Eye Protection</p> <ul style="list-style-type: none"> <li>• To comply with national standards flight helmets must consist of a one-piece hard shell, must cover the top, sides and rear of the head.</li> </ul>	<p>Slide 1-16</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Hearing protection program is required whenever employees are exposed to noise equal to, or exceeding an eight-hour time-weighted average of 85 decibels (dBA).</li> <li>• Eye protection is required in work environments where air particle contaminants are present.</li> </ul> <p>The three standards mentioned are met with the SPH-5 flight helmet.</p>	<p>Slide 1-17</p> <p>Slide 1-18</p>
<div style="border: 2px solid black; padding: 5px; margin-bottom: 10px;"> <p><b>Demonstrate the proper fitting of the aviator's flight helmet. It is imperative that students understand how to properly fit and wear the helmet.</b></p> </div> <p>The SPH-4 is no longer being manufactured and has been replaced by the SPH-5. The Gentex SPH-5 is the current upgrade from the previous version. The fiberglass outside shell has been improved by replacing it with Kevlar. The interior webbing suspension system has been replaced using a thermo plastic liner (TPL).</p>	

OUTLINE	AIDS & CUES
<p>The current helmet exceeds the safety performance of the previous SPH-4 helmet in all areas of technical testing (crash force attenuation, helmet retention characteristics, overall weight, and hearing attenuation).</p> <div style="border: 2px solid black; padding: 5px; margin: 10px 0;"> <p><b>Ask for a volunteer to demonstrate fitting the helmet.</b></p> </div>	
<p>The procedure to ensure proper fit of the helmet is to demonstrate:</p> <ul style="list-style-type: none"> <li>• Donning and removing (doffing) the helmet.</li> <li>• Adjusting the nape strap.</li> <li>• Fastening and unfastening the chinstrap.</li> <li>• Operating the sun visor.</li> </ul>	<p>Slide 1-19</p>
<p>Don the helmet as follows:</p> <ul style="list-style-type: none"> <li>• Grip the retention assembly below the earcups as shown.</li> <li>• Grip and depress the ear pads into the ear cups to allow for more space to roll the helmet onto your head.</li> </ul>	<p>Slide 1-20</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Roll the helmet back and down onto the head. Press the helmet firmly downward with both hands to ensure that the helmet is properly seated on the head and the ears are surrounded by the earcups.</li> <li>• Check the distance between the eyebrows and the edge of the helmet shell; it should be approximately <math>\frac{3}{4}</math>" for optimum vision.</li> <li>• Tighten the rear of the retention assembly appropriately per manufacture specifications.</li> <li>• Fasten the chinstrap by inserting the snap end through the D-ring on the right side of the assembly, and snapping the connectors or per manufacture specifications.</li> <li>• Tighten the chinstrap to the desired tension. Once the desired tension is achieved, the chinstrap can be fastened and unfastened via the snap.</li> <li>• Lower and raise the visor the test operation and clearance.</li> </ul>	<p>Slide 1-21</p> <p>Slide 1-22</p>

OUTLINE	AIDS & CUES
<p>Evaluate the fit according to the following criteria:</p> <ul style="list-style-type: none"> <li>• The earcups should surround the ears completely.</li> <li>• The ear seals should be compressed to the greatest degree possible without discomfort.</li> <li>• The overall fit should be comfortable; no hotspots or pressure points should exist.</li> </ul> <p>Remove the helmet in reverse steps of the previous donning the helmet instructions.</p>	<p>Slide 1-23</p>
<p><b>The following material from 6 to 6c is applicable to open water flights usually only found in Alaska.</b></p>	
<p>6. Survival Equipment</p> <p>The nature of the survival equipment each aircraft carries depends on whether the flight will be strictly over water, over land, or special use. Basically there are two categories of survival equipment:</p> <ul style="list-style-type: none"> <li>• Over Water</li> <li>• Over Land</li> </ul> <p>This covers the minimum required for survival in the event of a crash.</p>	<p>Slide 1-24</p>

OUTLINE	AIDS & CUES
<p data-bbox="488 285 1024 447">When planning a mission, each person should ensure they have the appropriate clothing for the mission environment.</p> <p data-bbox="488 499 1052 617">You wouldn't wear Gucci loafers and a cotton sweater when flying an Alaskan wolf survey in January.</p> <div data-bbox="207 667 1052 810" style="border: 2px solid black; padding: 5px;"><p data-bbox="220 678 1029 800"><b>Refer students to the Aviation Life Support Equipment (ALSE) handbook and cover policy for the following issues.</b></p></div> <p data-bbox="488 858 764 894">a. Over Water</p> <p data-bbox="583 945 992 1022">The appropriate over water ALSE consists of:</p> <ul data-bbox="586 1073 1040 1409" style="list-style-type: none"><li data-bbox="586 1073 1040 1192">• Type of mission (extended over water or not)</li><li data-bbox="586 1245 808 1276">• Weather</li><li data-bbox="586 1329 1040 1409">• Water conditions (water temp &lt; 50 degrees F)</li></ul> <div data-bbox="207 1459 1052 1556" style="border: 2px solid black; padding: 5px;"><p data-bbox="220 1470 980 1547"><b>Point out that part 135. 167 of the FAR governs our extended over-water operations.</b></p></div>	<p data-bbox="1081 863 1235 898">Slide 1-25</p>



OUTLINE	AIDS & CUES
<p data-bbox="488 283 959 321">c. Anti-Exposure Garments</p> <p data-bbox="583 369 1029 617">All occupants must wear anti-exposure garments when conducting extended over-water flights where the water temperature is less than 50 degrees F.</p> <p data-bbox="583 665 943 747">There are two types of anti-exposure garments:</p> <ol data-bbox="586 795 1032 1255" style="list-style-type: none"> <li data-bbox="586 795 1032 1045">1) Anti-exposure flight suit, a one-piece insulated coverall that provides some hypothermia protection and buoyancy.</li> <li data-bbox="586 1094 997 1255">2) Survival suit, a dry immersion suit made from closed cell material.</li> </ol> <p data-bbox="680 1304 1044 1596">Caution should be taken where wearing anti-exposure garments will hinder their ability to egress from a submerged or overturned aircraft.</p>	<p data-bbox="1081 283 1235 321">Slide 1-29</p> <p data-bbox="1081 665 1235 703">Slide 1-30</p>



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Nylon rope (50 ft)</li> </ul> <p>e. Personal Survival Equipment</p> <p>Although policy does not require that agency personnel carry personal survival kits, it is recommended.</p> <p>Aircraft accident experience has shown that survival equipment not attached to the occupants at the time of egress is often not recovered by the survivors.</p>	<p>Slide 1-33</p>
<p>The following are suggested items to have in a personal survival kit:</p> <ul style="list-style-type: none"> <li>• Waterproof matches</li> <li>• Magnesium fire starter</li> <li>• Space blankets</li> <li>• Large plastic bag</li> <li>• First aid kit</li> <li>• Knife</li> <li>• Hand-held radio</li> <li>• Water purification tablets</li> <li>• Signal mirror</li> </ul>	<p>Slide 1-34</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Flashlight</li> <li>• Whistle</li> </ul>	
<p data-bbox="203 451 836 493">III. READINESS FOR ASSIGNMENT</p> <p data-bbox="300 535 901 619">Assemble Information and Materials for Assignment</p> <p data-bbox="300 661 673 703">Suggested items to have:</p> <ul style="list-style-type: none"> <li>• Fireline pack/flight gear</li> <li>• Passenger/Cargo Manifest</li> <li>• Passenger Briefing Card</li> <li>• IRPG</li> <li>• Radio w/flight helmet connector</li> <li>• Cloning cable</li> <li>• Global positioning system (GPS)</li> <li>• Spare batteries</li> <li>• Calculator</li> <li>• Fiber tape</li> <li>• Black electrical tape</li> <li>• Flagging</li> <li>• Knife</li> <li>• Notepads</li> </ul>	<p data-bbox="1079 451 1242 493">Slide 1-35</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Blue or black pens</li> <li>• Crew time report (CTR)</li> <li>• Fire timesheets (OF-288)</li> <li>• Unit Log (ICS-214) and other ICS forms</li> </ul>	
<p>IV. ASSIGNMENT INFORMATION</p>	<p>Slide 1-36</p>
<p>A. Dispatch Ordering Process</p> <ol style="list-style-type: none"> <li>1. When a helicopter is needed the initial attack, dispatch submits an aircraft resource order. <p>Local agencies and cooperators are checked with first.</p> <ul style="list-style-type: none"> <li>• If unfilled locally the order goes to a Geographical Area Coordination Center (GACC).</li> <li>• If unfilled at a GACC, it goes to the National Interagency Coordination Center (NICC).</li> <li>• NICC in Boise, Idaho has ultimate authority for managing national aircraft resources.</li> <li>• This cycle then returns to the local dispatch.</li> </ul> </li> </ol>	<p>Slide 1-37</p>
<ol style="list-style-type: none"> <li>2. The requesting unit must request a module be assigned to an aircraft when ordering.</li> </ol>	<p>Slide 1-38</p>



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Reporting location – Block 12</li> <li>• Reporting time – Block 12</li> <li>• Transportation arrangements, travel routes</li> <li>• Contact procedures (telephone/radio)</li> <li>• Charge code – Finance Code Box</li> </ul> <div style="border: 2px solid black; padding: 5px; margin-top: 10px;"> <p><b>Explain the difference between an overhead single resource order and an overhead attached to an aircraft order. (A-1.2, O-36)</b></p> </div>	
<p>C. Mobilization</p> <p>Obtain a copy of the resource order and request number from the dispatching office.</p> <p>Determine mode of travel comply with weight limitations.</p> <ul style="list-style-type: none"> <li>• Commercial airline</li> <li>• GOV</li> <li>• Rental vehicle</li> <li>• Charter flight</li> </ul>	<p>Slide 1-42</p>
<div style="border: 2px solid black; padding: 5px; margin-bottom: 10px;"> <p><b>Discuss various packing options depending on mode of travel.</b></p> </div> <p>The local unit dispatch office may be able to provide you with additional information such as:</p>	<p>Slide 1-43</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Briefing packets</li> <li>• Maps</li> <li>• Situation updates</li> <li>• Additional frequencies and contacts</li> <li>• Flight itineraries</li> </ul> <p>D. Module Preparation (CWN)</p> <p>The helicopter crewmember may or may not know the other module members or where they are from. If possible, a brief contact prior to dispatch can verify items like PPE, radio, and radio equipment compatibility, any details to “marry up.”</p>	<p>Slide 1-44</p>
<div style="border: 2px solid black; padding: 2px;"><b>Emphasize:</b></div>	
<p>“Marriage” of the helicopter and module should occur at a pre-designated location away from the incident. This is where the module manager completes the pre-use inspection and documentation.</p> <p>The Helicopter Manager must be confirmed before NICC assigns a call-when-needed (CWN) helicopter.</p>	<p>Slide 1-45</p>
<p>For any fire assignment, with the exception of Alaska, the following modules must be assigned to each aircraft:</p>	<p>Slide 1-46</p>

OUTLINE			AIDS & CUES
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<u>Category</u>	<u>Standard Category</u>	<u>Restricted Category</u>
Type 1	Manager plus 4	Manager only
Type 2	Manager plus 3	Manager only
Type 3	Manager plus 2	Manager only

In Alaska, the minimum is a manager for all categories, although there will often be modules assigned.

NICC will not automatically assign a module to helicopter orders; the requesting unit must request a module be assigned when ordering the aircraft.

Occasionally, crewmembers are ordered to support helibase functions and are not assigned to an aircraft or helicopter manager.

Slide 1-47

V. CHECK-IN PROCESS

**The following is specific to going out as an overhead single resource order.**

A. Arrive at the Incident and Check-in

Each individual should ensure that all information needed to complete the Check-in List (ICS-211) is provided.

Resource order and request numbers, manifest information, home base, departure point, method of travel and other qualifications blocks are especially important.

Slide 1-48

OUTLINE	AIDS & CUES
<p>There may be several locations for incident check-in. Check-in officially logs you in at the incident and provides important release and demobilization information.</p> <p>B. Check-in Locations (Single Resource)</p> <p>You may check-in at the following locations:</p> <ul style="list-style-type: none"> <li>• Incident Command Post (ICP)</li> <li>• Base or camp</li> <li>• Staging area</li> <li>• Helibase (for direct assignment)</li> </ul>	<p>Slide 1-49</p>
<p style="border: 2px solid black; padding: 5px;"><b>Discuss procedure differences if going out on an exclusive use module.</b></p>	
<p>VI. INITIAL BRIEFING</p> <p>After check-in, locate your incident supervisor (helibase manager or helicopter manager) and obtain your initial briefing.</p> <p>The items you receive in your briefing, in addition to functional objectives.</p>	<p>Slide 1-50</p>
<p>A. Initial briefing</p> <p>Obtain a copy: Incident Action Plan (IAP) or Project Aviation Safety Plan (PASP)</p> <p>Upon arrival on the incident/project you need to be briefed on:</p>	<p>Slide 1-51</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• The organization structure</li> <li>• The objectives</li> <li>• Status of the incident/project</li> <li>• Current and predicted weather (evening thunderstorms, red flag days, etc.)</li> <li>• Hazard/safety issues</li> <li>• Assigned duties</li> <li>• Radio frequencies</li> <li>• Other resources (aircraft equipment personnel and facilities)</li> <li>• Flight hazard map</li> <li>• Maps of the area</li> <li>• Meals</li> <li>• Helibase layout</li> <li>• Helispot locations</li> <li>• Deck procedures</li> <li>• Briefing/debriefing times</li> <li>• Crash rescue procedures and plan</li> </ul>	<p>Slide 1-52</p> <p>Slide 1-53</p>
<div style="border: 2px solid black; padding: 5px;"><b>Hand out a copy of an IAP.</b></div>	<p>HO-1-1</p>

OUTLINE	AIDS & CUES
<p>B. Incident action plan key information from briefing</p> <p>There are a number of ICS forms that you will see and use regularly as a helicopter crewmember. Some examples are:</p> <p>Forms in the Incident Action Plan (IAP)</p> <ul style="list-style-type: none"> <li>• ICS 201, Incident Briefing</li> <li>• ICS 202, Incident Objectives</li> <li>• ICS 203, Organization Assignment List</li> <li>• ICS 204, Assignment List</li> <li>• ICS 205, Incident Radio Communication Plan</li> <li>• ICS 206, Medical Plan</li> <li>• ICS 220, Air Operations Summary</li> </ul> <p>Ask the helicopter manager for any of the above that has been presented in this unit.</p>	<p>Slide 1-54</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>Any questions?</b></p> <p><b>Review Unit Objectives.</b></p> <p><b>Hand out unit quiz. Correct quiz as a class.</b></p> </div>	<p>Slide 1-55</p> <p>HO-1-2</p>

## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 2 – Effective Working Relationships

**Time** 30 Minutes

### Objectives

1. Define the professional conduct the HECM should practice.
2. Define how to establish and maintain positive interagency working relationships.

### Strategy

This unit will help students to establish effective working relationships. This will be done through lecture and student interaction.

### Instructional Method

- Facilitation/informal lecture with PowerPoint

### Instructional Aids

- Computer with LCD projector and presentation software
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)

### Exercise

- Conduct

### Evaluation Methods

- Classroom review and discussion.
- Unit 2 Quiz – HO-2-1

### Outline

- I. Professional Conduct
- II. Positive Working Relationships

## **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: Helicopter Crewmember, S-271

UNIT: 2 – Effective Working Relationships

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>	Slide 2-1
<b>Present Unit Objectives.</b>	Slide 2-2
<b>I. PROFESSIONAL CONDUCT</b>  As a helicopter crewmember you are a member of an organized group. You are expected to conduct yourself in a professional manner while on an incident assignment.	Slide 2-3
<b>EXERCISE: Conduct</b>  <u>Purpose:</u> For students to become familiar with the importance of their conduct.  <u>Format:</u> Students groups or classroom  <u>Time:</u> 10 minutes  <u>Materials:</u>	Slide 2-4
<ul style="list-style-type: none"><li>• Flip chart with marker</li></ul> <u>Instructions:</u>  1. Instruct students to record what they think is their expected conduct as a helicopter crewmember.	Slide 2-5

OUTLINE	AIDS & CUES
<p>2. Have students think of scenarios at helibases and overnight assignments.</p> <p>3. When finished, discuss and review answers in class.</p> <p>4. Compare student answers to outline as you proceed.</p>	
<p><b><u>End of Exercise.</u></b></p>	
<p>A. What is Conduct?</p> <p>Conduct can be defined as the way one acts, or ones' behavior. The way you conduct yourself paints an image of you, who you are, and the agency you represent.</p>	<p>Slide 2-6</p>
<p>Remember, there is always someone, or a group who is watching how you conduct yourself.</p>	<p>Slide 2-7</p>
<p>Conduct yourself in a professional manner:</p> <ul style="list-style-type: none"> <li>• Be respectful – To others and their property, and to public property.</li> <li>• Be courteous – To other crewmembers, to the public and officials.</li> <li>• Be prompt – For briefings, meetings, and completing tasks.</li> <li>• Be safe – At all times</li> <li>• Set an example – Be a positive role model.</li> </ul>	<p>Slide 2-8</p>



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Resolve conflicts between individuals on the crew.</li> <li>– Keep supervisors/co-workers informed.</li> </ul>	
<p>B. Establish and Maintain Positive Interagency Working Relationships.</p> <p>Throughout your career you will have that opportunity to work with other agencies and their personnel.</p>	Slide 2-13
<ul style="list-style-type: none"> <li>• When working with other agencies maintain a professional conduct. <ul style="list-style-type: none"> <li>– Put safety before and above all other objectives.</li> <li>– Be respectful – To line officers, policies, and their way of doing business.</li> <li>– Be courteous – To supervisors, crewmembers, and officials.</li> <li>– Establish and maintain good communications.</li> </ul> </li> </ul>	Slide 2-14
<ul style="list-style-type: none"> <li>– Remain focused on the task so they will function safely and efficiently.</li> <li>– Provide clear instructions on the tasks to be accomplished.</li> </ul>	Slide 2-15

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Build everyone into an interagency team.</li> <li>– Be honest, personable, professional and presentable.</li> </ul>	
<div style="border: 2px solid black; padding: 5px;"> <p><b>Review Unit Objectives</b></p> <p><b>Hand out unit quiz. Correct quiz as a class.</b></p> </div>	<p>Slide 2-16</p> <p>HO-2-1</p>



## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 3 – ICS Concepts and Principles

**Time** 45 Minutes

### Objectives

1. Describe the application of the Incident Command System (ICS) as it pertains to the HECM.
2. Describe the ICS types of helicopters and the minimum National Standards for each type.

### Strategy

This unit will help students to gain an understanding of the ICS organization and the ICS types of helicopters. This will be done through lecture, helicopter photos, and student interaction.

### Instructional Methods

- Facilitation/informal lecture with PowerPoint
- Group Exercise

### Instructional Aids

- Computer with LCD projector and presentation software
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)

### Exercise

- None

### Evaluation Methods

- Review and discuss group exercise
- Unit 3 Quiz - HO-3-1

## **Outline**

- I. ICS Concepts and Principles
- II. ICS Helicopter Typing

## **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





OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Division Supervisor (DIVS) coordinates aerial tactical request for their division.</li> </ul>	
<p><b>Refer students to the IHOG Chapter 2 for position duties and responsibilities.</b></p>	
<p>The helibase or helispot manager may directly or indirectly supervise the helicopter crewmember.</p>	Slide 3-11
<p>B. Follow the Chain of Command</p> <p>The ICS is a series of management positions in order of authority. Following the chain of command is simplified.</p>	Slide 3-12
<p>The <b>chain of command</b> refers to the orderly line of authority within the ranks of the incident management organization. The flow of task assignments and resource requests between positions in the ICS occurs only with the person directly above or below them on the organizational chart.</p>	Slide 3-13
<p>It is very important to following the established chain of command anytime you have a question or a concern to get it resolved.</p>	Slide 3-14



OUTLINE	AIDS & CUES
<p>Terminology for the organizational elements involved is standard and consistent.</p> <ul style="list-style-type: none"> <li data-bbox="396 453 1029 701">• <b>Incident Facilities</b> – Common terminology is used to designate the facilities in the vicinity of the incident area that will be used in the course of incident management activities.</li> <li data-bbox="396 751 1029 1129">• <b>Resource Descriptions</b> – Major resources—including personnel, facilities, and major equipment and supply items—used to support incident management activities are given common names and are "typed" with respect to their capabilities, to help avoid confusion and to enhance interoperability.</li> <li data-bbox="396 1180 1029 1516">• <b>Position Titles</b> – At each level within the ICS organization, individuals with primary responsibility have distinct titles. Titles provide a common standard for all users, and also make it easier to fill ICS positions with qualified personnel.</li> </ul>	<p>Slide 3-19</p> <p>Slide 3-20</p> <p>Slide 3-21</p>

II. ICS HELICOPTER TYPING

Slide 3-22

For the purpose of managing aerial fire resources used during fire suppression the Incident Command System developed a classification to distinguish the different types, sizes, and capabilities of helicopters.

Helicopters were classified as “Type” along with a number to distinguish what category an aircraft fits in based on capabilities. Typically, a Type 1 is the largest category.

Typing of helicopters took the guess work out of what kind of helicopter to order or what type of helicopter you’re expecting.

Slide 3-23

This simplified the entire air operation organization.

A. Helicopter Typing

Slide 3-24

Type	Passenger Seats	Minimum Allowable Payload	Minimum Gallons Retardant
1	15+	5,000 lbs	700
2	9-14	2,500 lbs	300
3	4-8	1,200 lbs	100

It is important to recognize that not all makes of helicopters are equal. A helicopter may have twelve passenger seats, but that does not mean it can lift that much weight. Density altitude and other environmental factors can dramatically affect payload.

Slide 3-25

Density altitude will be covered in Unit 5.

OUTLINE	AIDS & CUES
<p>Different models within the same series of helicopter may look the same, but newer models generally have increased performance.</p> <p>An example is the Bell 206 “Long Ranger” Series (L-1, L-3, L-4). The L-1, L-3, and L-4 look the same, but the L-4 has a bigger engine and better performance.</p> <p>Other examples are the AS350 “Eurocopter Astar” (BA, B-2, B-3), and Bell 205.</p> <p>Even within the same make and model some helicopters may have engine and/or rotor blade modifications that dramatically increase performance. If you don’t know, ask the pilot.</p>	<p>Slide 3-26</p> <p>Slide 3-27</p>
<p><b>For the following, focus on what determines a Type 1, 2, or 3 helicopter. Not so much on makes and models.</b></p>	
<ol style="list-style-type: none"> <li>1. Type 1 -- Minimum of: <ul style="list-style-type: none"> <li>• 15 passenger seats</li> <li>• 700 gallons retardant or water</li> <li>• 5,000 lbs. allowable payload at 59 degrees Fahrenheit at sea level</li> </ul> </li> </ol>	<p>Slide 3-28</p>

OUTLINE	AIDS & CUES
<p>Examples include:</p> <ul style="list-style-type: none"> <li>• Kaman K1200 “K-MAX”</li> <li>• Kaman H-43 “Husky”</li> <li>• Bell 214 B-1</li> <li>• Bell 214 ST</li> <li>• Sikorsky S-70</li> <li>• UH-60 “Blackhawk” (Military)</li> <li>• Aerospatiale AS-332L “Super Puma”</li> <li>• Boeing Vertol 107-II</li> <li>• Boeing Vertol 234 (CH-47 Military)</li> <li>• Sikorsky S-64 “Sky Crane”</li> <li>• Sikorsky S-61</li> </ul>	<p>Slide 3-29 thru Slide 3-38</p>
<p>2. Type 2 -- Minimum of:</p> <ul style="list-style-type: none"> <li>• 9-14 passenger seats</li> <li>• 300 gallons retardant or water</li> <li>• 2,500 lbs. allowable payload at 59 degrees Fahrenheit at sea level</li> </ul>	<p>Slide 3-39</p>

OUTLINE	AIDS & CUES
<p>Examples include:</p> <ul style="list-style-type: none"> <li>• Bell 204B</li> <li>• Bell 205</li> <li>• Bell 212</li> <li>• Bell 412</li> <li>• Sikorsky S-58T</li> <li>• Eurocopter BK-117 A-4</li> </ul>	<p>Slide 3-40 thru Slide 3-46</p>
<p>3. Type 3 -- Minimum of:</p> <ul style="list-style-type: none"> <li>• 4-8 passenger seats</li> <li>• 100 gallons retardant or water</li> <li>• 1,200 lbs. allowable payload at 59 degrees Fahrenheit at sea level</li> </ul>	<p>Slide 3-47</p>
<p>Examples include:</p> <ul style="list-style-type: none"> <li>• McDonnell Douglas (MD) 500D and Hughes 500D</li> <li>• MD 500E</li> <li>• MD 530F</li> <li>• MD 900 NOTAR</li> <li>• Bell 206 B-III "Jet Ranger"</li> <li>• Bell 206 L-3/4 "Long Ranger"</li> </ul>	<p>Slide 3-48 Thru Slide 3-59</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Bell 407</li> <li>• Aerospatiale AS-350 “Astar”</li> <li>• Aerospatiale AS-355 “Twin Star”</li> <li>• Aerospatiale SA-315B “Lama”</li> <li>• Aerospatiale SA-316B Alouette III</li> <li>• Eurocopter MBB BO-105</li> </ul>	
<p>B. Summary</p> <p>ICS types of helicopters are intended to provide a general classification of their capability.</p> <p>Helicopters dispatched to incidents are generally what are available. However, it is important for firefighters to know the general capabilities of the types of helicopters to effectively and efficiently use them when assigned to an incident.</p>	<p>Slide 3-60</p>
<p><b>Review Unit Objectives.</b></p> <p><b>Hand out unit quiz. Correct quiz as a class.</b></p>	<p>Slide 3-61</p> <p>HO-3-1</p>

## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 4 – Communications

**Time** 1 ½ Hours

### Objectives

1. Ensure all communication is performed using clear text.
2. Describe the process of communication within the chain of command.
3. Demonstrate proper radio usage.
4. Describe helicopter marshalling procedures and techniques.

### Strategy

This unit will help students to perform proper radio protocol. This will be accomplished through lecture, discussion, and hands-on exercise.

### Instructional Methods

- Facilitation/informal lecture with PowerPoint
- Group exercise

### Instructional Aids

- Computer with LCD projector and presentation software
- Incident Response Pocket Guide (IRPG)
- Video – Helicopter Operations DVD (12:38 minutes)
- Basic Aviation Safety
- USFS Manual 5716.5
- DOI Departmental Manual 351 DM 1.1.4

### Exercise

- Clock Orientation

### Evaluation Methods

- Review and discuss group exercise.
- Unit 4 Quiz – HO-4-1

## **Outline**

- I. Communication Protocol
- II. Radio Communications

## **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: Helicopter Crewmember, S-271

UNIT: 4 – Communications

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>  <b>Present Unit Objectives.</b>  <b>Show Helicopter Operations Video.</b>	Slide 4-1  Slide 4-2  DVD
I. COMMUNICATION PROTOCOL	Slide 4-3
A. Clear Text  All communications should be in clear text. What is clear text? Clear text is the use of the English language to communicate. All radio transmissions, written messages, and verbal instructions will be in clear text. No ten codes or agency specific codes are used when using clear text.  <ul style="list-style-type: none"><li>• Use Clear Text</li><li>• Be brief, clear and to the point (short concise communication).</li><li>• Plan your transmission before you key the radio. “Don’t think out loud on the radio”.</li></ul>	Slide 4-4

OUTLINE	AIDS & CUES
<p data-bbox="298 281 899 323">B. Flight Plans and Flight Following</p> <p data-bbox="393 369 1032 575">All aviation missions for USDA Forest Service and Department of the Interior agencies, regardless of how simple or complex, are required to have an approved flight plan filed.</p> <div data-bbox="207 625 1052 764" style="border: 2px solid black; padding: 5px;"> <p data-bbox="220 634 1010 756"><b>Reference USFS Manual 5716.5-Flight Plans And Flight Following and DOI Departmental Manual 351 DM 1.1.4- Flight Plans and Flight Following.</b></p> </div> <p data-bbox="393 814 1032 1020">A flight plan is a detailed outline of where, when, and how the mission will be flown. Good thorough flight planning leads to a safe mission, poor planning only increases the chances for problems or accidents.</p> <p data-bbox="393 1071 977 1150">1. Federal Aviation Administration flight plan (for point to point)</p> <p data-bbox="487 1201 1049 1323">FAA flight plans shall be filed by the pilot prior to take-off whenever possible.</p> <p data-bbox="393 1373 961 1453">2. Agency flight following (radio) providing:</p> <p data-bbox="487 1503 941 1667">a. Flight following will be accomplished under the agency's written flight following policy.</p>	<p data-bbox="1081 281 1218 323">Slide 4-5</p> <p data-bbox="1081 1071 1218 1113">Slide 4-6</p> <p data-bbox="1081 1201 1218 1243">Slide 4-7</p> <p data-bbox="1081 1373 1218 1415">Slide 4-8</p>

OUTLINE	AIDS & CUES
<p>b. Radio contact will be made at predetermined intervals not to exceed one hour. (Most agencies use predetermined intervals of less than one hour, e.g., 15 to 30 minutes).</p>	
<p>c. Position reports or amendments are communicated and recorded.</p>	Slide 4-9
<p>d. Personnel tasked with flight following responsibility must monitor the communications radio at all times during the flight.</p>	
<p>e. Agency flight following must minimally include:</p> <ul style="list-style-type: none"> <li>• Aircraft type and identification (“N” number)</li> <li>• Aircraft color</li> <li>• Pilot name(s)</li> <li>• Fuel on board (e.g., two hours of fuel)</li> <li>• Passenger(s) name(s)</li> <li>• Passenger/cargo weight</li> <li>• Nature of mission</li> </ul>	Slide 4-10

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Flight routes/point of departure/destination</li> <li>• Estimated duration of mission</li> <li>• Estimated time of departure</li> <li>• Estimated time of arrival</li> <li>• Check-in procedures</li> </ul> <p>f. Automated Flight Following (AFF):</p> <p>AFF is a satellite/web-based system, which allows the dispatcher to monitor aircraft location on a computer screen.</p> <p>AFF reduces the requirement to “check in” via radio every 15 minutes, and provides the dispatcher near real time information regarding the aircraft latitude and longitude, heading, airspeed, altitude, and flight history. This reduces pilot workload, clears congested radio frequencies, and provides the dispatcher with much greater detail and accuracy on aircraft location.</p>	<p>Slide 4-11 Slide 4-12</p>

OUTLINE	AIDS & CUES
<p>AFF is an approved method of agency flight following. Most agency aircraft have AFF capability.</p>	
<p>C. Flight Planning (emergency response for overdue/missing aircraft)</p> <p>An FAA study on general aviation accidents found that the response time for search and rescue (SAR) units to arrive at the accident scene was significantly decreased when a flight plan was used. Filing a written flight plan and flight following may double your odds of surviving an aircraft mishap.</p> <ol style="list-style-type: none"> <li>1. The average time for SAR initial notification is about 30 minutes.</li> <li>2. Average time for SAR units to arrive on scene is about 4 hours.</li> </ol>	<p>Slide 4-13</p>
<p>A written flight plan and flight following dramatically decreases the response time for SAR efforts. It may still require more than five hours for individuals to check and confirm there is a missing aircraft.</p> <p>The search area may be massive because only written information is available to determine the flight route and destination. Deviation from a flight plan only complicates the potential of locating a downed aircraft.</p>	<p>Slide 4-14</p>

OUTLINE	AIDS & CUES
<p>By the time SAR efforts locate the aircraft and arrive on scene, an average time of 38 hours has passed. What is the potential of surviving a trauma if it takes more than a day to get to you?</p>	Slide 4-15
<p>Without a flight plan, in a downed aircraft, if you have even minor injuries, the chances of your survival are slim. It may take more than a day for someone to acknowledge that you're missing (FAA average of 35.5 hours).</p>	Slide 4-16
<p>More than three days (FAA average of 82 hours) may pass before someone arrives at the scene of the accident. What are your chances for survival?</p>	Slide 4-17
<p>Post-Crash Survival Time—After an accident in a remote area, an injured person may survive for one day. An uninjured person may survive for three days.</p>	Slide 4-18 Slide 4-19
<p>Always consider the environment that you will be flying in. Even on routine flights, remember to bring clothing and/or supplies commensurate with the conditions in the event you have a mishap. Know what your agencies policy is regarding supplemental survival equipment.</p>	Slide 4-20
<p><b>Diagram of communication structure for aircraft and the air operations organization including ground resources.</b></p>	Slide 4-21

OUTLINE	AIDS & CUES
<p>D.    Communication within the Chain of Command</p> <p>          The chain of command refers to the orderly line of authority within the ranks of the incident management organization.</p> <p>          Task assignments and resource request between positions occurs only with the person directly above or below them in the organization.</p> <p>          The helibase usually has good radio communications once it is established. Radio is the primary communication link between other Air Operation Sections; helispots, aircraft, ASGS, etc., and other incident sections and functions; Logistics, Supply, Medical, etc.</p> <p>          It is important to follow the chain of command when contacting another section or function.</p>	<p>Slide 4-22</p>
<p>II.    RADIO COMMUNICATIONS</p> <p>      A.    Radio Communications</p> <p>          Ground Communications</p> <ul style="list-style-type: none"> <li>•       Logistics</li> <li>•       Line operations</li> <li>•       Operations Section Chief</li> <li>•       Helibase operations</li> </ul>	<p>Slide 4-23</p>

OUTLINE	AIDS & CUES
<p>Air to Ground Communications</p> <ul style="list-style-type: none"> <li>• Air attack</li> <li>• Flight following</li> <li>• Takeoff and landing coordinator</li> </ul>	Slide 4-24
<p>Air to Air Communications</p> <ul style="list-style-type: none"> <li>• Air attack to incident aircraft</li> <li>• Position reporting</li> <li>• Coordination between aircraft</li> </ul>	Slide 4-25
<p>Radio is the most common mode of communication used on incidents. It, however, is subject to limitations such as line-of-site.</p>	Slide 4-26
<p>B. Types of Radios</p> <p>There are three types of radio communication available:</p> <ul style="list-style-type: none"> <li>• <b>VHF-FM</b> use most frequently for on incident communications.</li> <li>• <b>VHF-AM</b> is commonly known as VICTOR radio. It is an AM frequency and can be used to direct aircraft from the ground takeoff and landing coordinator (TOLC) or provide air-to air communications between aircraft. Either of the two, VHF-FM or VHF-AM, can be used for continuous flight following.</li> <li>• <b>UHF-FM</b> is primarily for logistical helibase and Incident Base Camp.</li> </ul>	Slide 4-27





OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Primary and secondary targets</li> <li>• Wind speed and direction</li> </ul>	
<p>3. Where do you get this information?</p> <ul style="list-style-type: none"> <li>• Helibase</li> <li>• Incident Action Plan (IAP)</li> <li>• Division/Group supervisor</li> <li>• Personal observations</li> <li>• Radio traffic</li> <li>• Briefings</li> </ul>	Slide 4-36
<p>4. Operating procedures</p> <p>a. Use the ICS position resources (ATGS, HLCO, ATCO) to coordinate drops.</p> <p>b. Have and know the tactical plan.</p> <ul style="list-style-type: none"> <li>• Anchor and flank</li> <li>• Hot spot</li> <li>• Buy time</li> <li>• Secure the edge</li> </ul>	Slide 4-37

OUTLINE	AIDS & CUES
<p>c. Use standard fire terminology.</p> <ul style="list-style-type: none"> <li>• Head</li> <li>• Heel</li> <li>• Right flank</li> <li>• Left flank</li> <li>• Spot fire</li> </ul>	<p>Slide 4-38</p>
<p>d. Use target description</p> <ul style="list-style-type: none"> <li>• Parts of the fire</li> <li>• Clock orientation (from the aircraft's position)</li> <li>• Right, left, nose, tail</li> <li>• High, even, low</li> <li>• Cardinal points (north, south, east, and west). Only use compass directions if you and the pilot both agree on which way is north. This is the least desirable method.</li> </ul>	<p>Slide 4-39</p>



OUTLINE	AIDS & CUES
<p>e. Use easily identifiable target references.</p> <ul style="list-style-type: none"> <li>• To previous drop</li> <li>• From your position</li> <li>• To topographic or terrain features</li> <li>• To human made features (cut areas, trails, roads, dozer line, vehicles, structures)</li> <li>• Part of fire (heel, head, flanks) or fire activity, e.g., spot fire on right flank</li> <li>• To cardinal points (agree with pilot which way is north)</li> </ul>	<p>Slide 4-49</p>
<p>f. Describe target when pilot is in position to see target.</p> <ul style="list-style-type: none"> <li>• Be brief, clear and to the point (short concise communication).</li> <li>• Plan your transmission before you key the radio.</li> <li>• Don't "think out loud" on the radio.</li> </ul>	<p>Slide 4-50</p>

OUTLINE	AIDS & CUES
<p>5. Stages of pilot orientation</p>	<p>Slide 4-51</p>
<p>a. Long distance (Radio contact but no visual contact with aircraft)</p> <ul style="list-style-type: none"> <li>• Geographical and topographical reference points must be large and obvious.</li> <li>• GPS coordinates are useful if the air crew has time to enter the information.</li> <li>• Relay lat/longs to helibase when initial order is made for aircraft allowing pilots to enter coordinates into GPS unit while still on ground.</li> </ul>	<p>Slide 4-52</p>
<div style="border: 2px solid black; padding: 5px; display: inline-block;"> <p><b>Review and discuss latitude and longitude procedures with students. Expand as needed.</b></p> </div>	
<ul style="list-style-type: none"> <li>• Keep positive communication with aircraft until visual contact is established (both the ground contact and pilot).</li> </ul>	<p>Slide 4-53</p>







OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Brace yourself when large helicopters are landing or taking off due to the velocity of the rotor downwash.</li> <li>• Keep landing area free of litter and trash.</li> </ul>	
<p>F. Hand Signals</p> <p>Use National Standards – Use the hand signals in Basic Aviation Safety or in the Incident Response Pocket Guide (IRPG).</p>	<p>Slide 4-61</p>
<p>Standard hand signals should be used.</p>	<p>Slide 4-62</p>
<div style="border: 2px solid black; padding: 5px; display: inline-block;"> <p><b>Demonstrate all hand signals and explain the intent of each.</b></p> </div>	
<ul style="list-style-type: none"> <li>• Include pilot in training so everyone has the same understanding.</li> <li>• Hand signals need to be exaggerated to be effective.</li> <li>• A smooth transition between one signal to the next.</li> <li>• Minimize the time spent holding the helicopter in a hover.</li> </ul>	

OUTLINE	AIDS & CUES
<p><b>Refer the students to - IRPG for Helicopter Hand Signals.</b></p> <p><b>As a class go through each signal and practice.</b></p>	<p>Slide 4-63</p>
<p><b>Review Unit Objectives.</b></p> <p><b>Hand out unit quiz. Correct quiz as a class.</b></p>	<p>Slide 4-64</p> <p>HO-4-1</p>

## UNIT OVERVIEW

<b>Course</b>	Helicopter Crewmember, S-271
<b>Unit</b>	5 – Helicopter Performance, Limitations, and Load Calculations
<b>Time</b>	2 Hours

### Objectives

1. Describe general aspects of helicopter design, flight controls, and terminology.
2. Define “in-ground-effect” and “out-of-ground-effect” as they relate to helicopter performance.
3. Describe air density altitude and the effects on helicopter performance.
4. Describe the process for completing a load calculation form.

### Strategy

This unit will help students to articulate the principles and general aspects of flight as they relate to helicopter performance. This will be accomplished through lecture, discussion, and hands-on exercises.

### Instructional Methods

- Facilitation/informal lecture with PowerPoint
- Group exercises

### Instructional Aids

- Computer with LCD projector and presentation software
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)
- Density Altitude Chart – HO-5-1
- Load Calculation Form, NFES# 1064 – HO-5-2
- Interagency Helicopter Passenger/Cargo Manifest Form – OF 252
- DVD – Helicopter Capabilities and Limitations – NFES# 2392 (12:13 minutes)

### Exercise

- Density Altitude Chart

## **Evaluation Method**

- Unit 5 Quiz – HO-5-3

## **Outline**

- I. Helicopter Performance
- II. Principles of Flight
- III. Helicopter Load Calculations

## **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: Helicopter Crewmember, S-271

UNIT: 5 – Helicopter Performance, Limitations, and Load Calculations

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>	Slide 5-1
<b>Present Unit Objectives.</b>	Slide 5-2
	Slide 5-3
<b>Show Helicopter Capabilities And Limitations, NFES 001498.</b>	DVD
<b>I. HELICOPTER PERFORMANCE</b>	
<p>The helicopter has proven its value and versatility throughout the world. Its abilities to operate from restricted area and to remain above a selected spot are perhaps the helicopter's greatest attributes. Managed by trained personnel and treated with proper respect, it is as inherently safe as any equipment in use today.</p>	
<p>To properly manage helicopters for safe and efficient use, we must know something of their basic capabilities and limitations.</p>	



OUTLINE	AIDS & CUES
<p>As the pitch of the blades is increased, lift is created causing the helicopter to rise from the ground, hover or climb, as long as sufficient power is available.</p>	
<p>b. Throttle Control</p> <p>As the pitch is increased, power must be added to maintain rotor RPM when the helicopter lifts off or climbs. On the turbine-powered helicopters, this power coordination is accomplished automatically through the fuel control and governor systems of the turbine engine. A manual throttle control may be located on the collective or on the control panel.</p>	<p>Slide 5-8</p>
<p>c. Anti-Torque Control</p> <p>Two anti-torque pedals are provided to counteract the torque effect of the main rotor. This is done by increasing or decreasing the thrust of the tail rotor.</p>	<p>Slide 5-9</p>
<p>The anti-torque pedals accomplish this by changing the pitch (angle of attack) or the tail rotor blades.</p>	<p>Slide 5-10</p>

OUTLINE	AIDS & CUES
<p>Pedal action will provide heading and directional control in hover and at low airspeeds.</p> <p>On dual rotor helicopters, the problem of torque control is solved through the counter-rotation of the main rotor system. Pedal movement induces pitch changes to the main rotor blades, thereby accomplishing heading and directional control in a hover.</p> <p>As forward speed increases, the tail rotor becomes less necessary. The “slip-streaming” effect of the fuselage provides enough surface contact with the relative wind to counteract the torque of the main rotor.</p>	<p>Slide 5-11</p>
<p>d. Cyclic Control</p> <p>The “cyclic” is controlled by the pilot’s right hand. The purpose of the cyclic pitch control is to vary the amount of lift in the portion of the rotor disk. The aircraft moves in the direction that pressure is applied to the cyclic.</p>	<p>Slide 5-12</p>

OUTLINE	AIDS & CUES
<p>If the pilot moves the cyclic forward, the lift in the rear half of the rotor disk is increased, and the aircraft moves forward.</p>	
<p>3. Landing Gear</p>	
<ul style="list-style-type: none"> <li>• Skids – Skids are the most common type of landing gear used in light and medium-class helicopters.</li> </ul>	Slide 5-13
<ul style="list-style-type: none"> <li>• Wheels – Wheels are primarily used on medium and heavy helicopters.</li> </ul>	Slide 5-14
<ul style="list-style-type: none"> <li>• Floats – Floats can be used on land as well as water. There are two types; fixed or inflated. “Pop Outs” are inflated only as needed.</li> </ul>	Slide 5-15
<p>B. Helicopter Loading</p>	Slide 5-16
<div style="border: 2px solid black; padding: 5px; display: inline-block;"> <p><b>Talk about the importance of maintaining center of gravity for auto-rotations and slope landings.</b></p> </div>	
<p>1. Center of Gravity Effects</p>	
<ul style="list-style-type: none"> <li>• Consideration of center of gravity (CG) limitations is important in the loading of all aircraft, but is particularly important and critical in helicopters.</li> </ul>	

OUTLINE	AIDS & CUES
<p>In a helicopter, it is carried under a single point, like a pendulum; therefore, very little “out of CG” loading can greatly affect the controllability of the helicopter.</p> <ul style="list-style-type: none"> <li>• The CG point of most helicopters is an imaginary line extending from the rotor hub through to the cargo hook and extended straight below if an external load is attached.</li> <li>• Always consult pilot about proper loading. Try to keep load centered.</li> </ul> <p>It is also important to properly secure all materials loaded on or in a helicopter, as a shift in cargo could affect CG.</p>	<p>Slide 5-17</p>
<p>2. Floor Loading</p> <p>Careful attention must be given to small, heavy parcels loaded into helicopters to determine that the maximum pounds-per-square-inch limitations are not exceeded. Small, object can punch holes in flooring or collapse decking and supporting stringer.</p>	<p>Slide 5-18</p>

OUTLINE	AIDS & CUES
<p data-bbox="201 281 708 317">II. PRINCIPLES OF FLIGHT</p> <p data-bbox="297 367 1032 533">Certain terms are commonly used in reference to helicopter flight characteristics. Being familiar with these terms is important to persons involved with helicopter use.</p> <p data-bbox="297 579 612 615">A. Ground Effect</p> <p data-bbox="393 665 1039 917">A condition of improved rotor system performance encountered when the helicopter is hovering near the ground. The apparent result is increased lift thus decreased power requirements. This provides for a greater allowable payload.</p> <p data-bbox="393 963 980 999">1. Hover-In-Ground-Effect (HIGE)</p> <p data-bbox="488 1050 1037 1341">HIGE is achieved when the helicopter is hovering less than one-half the rotor diameter distance from the ground. In a hover, the rotor blades move large volumes of air from above the rotors down through the system.</p> <p data-bbox="488 1392 1037 1558">The ground interrupts the airflow under the helicopter; this reduces downward velocity of the air and produces an outward airflow pattern.</p> <div data-bbox="207 1608 1052 1705" style="border: 2px solid black; padding: 5px;"> <p><b>Emphasize – diminishes when hovering over water or tall grass.</b></p> </div>	<p data-bbox="1081 281 1235 317">Slide 5-19</p> <p data-bbox="1081 579 1235 615">Slide 5-20</p> <p data-bbox="1081 963 1235 999">Slide 5-21</p> <p data-bbox="1081 1392 1235 1428">Slide 5-22</p>

OUTLINE	AIDS & CUES
<p data-bbox="393 283 935 361">2. Hover-Out-Of-Ground-Effect (HOGE)</p> <p data-bbox="488 411 1019 575">HOGE occurs when the helicopter exceeds about one-half the rotor diameter distance from the ground, and the cushion of air disintegrates.</p> <p data-bbox="488 625 1047 915">To maintain a hover, the helicopter is now power dependent. This situation will occur when the terrain does not provide sufficient ground base, or when performing external load work. Maximum performance is required and payload may have to be reduced.</p> <p data-bbox="488 966 1044 1129">It is important to understand the capabilities and limitations presented by ground effect when choosing a landing site.</p> <p data-bbox="488 1180 1044 1598">When planning a helicopter project, the safety and efficiency of the operation will be enhanced by selecting landing areas that allow the pilot to approach into the wind and HIGE. Normal take-off and landings are initiated by bringing the helicopter up to an in-ground-effect hover and translating the aircraft into forward flight.</p> <p data-bbox="488 1648 1052 1894">Additional lift is gained as the helicopter moves from the turbulent air created from hovering, to undisturbed, “clean” air which moves through the rotor system as the helicopter increases airspeed.</p>	<p data-bbox="1081 283 1235 317">Slide 5-23</p> <p data-bbox="1081 625 1235 659">Slide 5-24</p> <p data-bbox="1081 966 1235 999">Slide 5-25</p>

OUTLINE	AIDS & CUES
<p>3. Translational Lift</p> <p>Translational lift occurs when the helicopter approaches 15 to 18 MPH indicated airspeed. Translational lift will also be produced when the helicopter is hovering with a 15 MPH steady headwind. Translational lift can be felt as an aircraft transitions from a hover to forward flight. A brief vibration can be felt as forward airspeed increases from a hover.</p>	Slide 5-26
<p>B. Autorotation</p> <p>Autorotation is a non-powered flight condition in which the rotor system maintains flight RPM by reversed airflow. It provides the pilot a means of safely landing the helicopter after an engine failure or other mechanical emergency.</p>	Slide 5-27
<ul style="list-style-type: none"> <li>• Helicopters have a freewheeling unit in the transmission which automatically disengages the engine from the rotor system in the event of failure. This allows the main rotor to rotate freely.</li> </ul>	Slide 5-28
<ul style="list-style-type: none"> <li>• When the helicopter is powered by the engine, airflow is downward through the rotors. During an autorotation airflow is upward, “wind milling” the rotor blades as the helicopter descends.</li> </ul>	Slide 5-29

OUTLINE	AIDS & CUES
<p>The pilot maintains constant rotor RPM by changing the pitch to the blades as the aircraft continues descent. As the helicopter approaches a landing site, the pilot flares the aircraft by moving the cyclic back and gently lifting the nose. This slows the forward airspeed and rate of descent. Before touchdown, the helicopter is leveled and the pilot utilizes the stored-up blade inertia to cushion the helicopter to the ground. The autorotation is complete.</p>	
<p>C. Height Velocity Diagram</p> <p>In the flight manual for each helicopter type is a chart which provides necessary information to complete a safe autorotation. This is a height velocity curve, indicating the comparative combination of airspeed and altitude require accomplish a safe autorotation (for most light helicopter, 350 to 450 feet above ground level at zero airspeed). When flying low-level or performing extended hovers, it dramatically reducing the safety margin and limiting the pilot's options.</p>	<p>Slide 5-30</p>
<p>D. Maximum Performance Takeoff</p> <p>On occasion, a maximum performance takeoff or landing must be accomplished. This occurs when the helicopter hovers-out-of-ground-effect before or after translational lift. In this situation, the helicopter is totally power dependent and the margin of safety is significantly reduced.</p>	<p>Slide 5-31 Slide 5-32</p>

OUTLINE	AIDS & CUES
<p>When possible, avoid confined areas, or large obstructions that require the pilot to use maximum power for extended periods.</p>	Slide 5-33
<p>E. Density Altitude</p> <p>Density altitude refers to a theoretical air density which exists under standard conditions of a given altitude.</p> <p>By definition, <b>density altitude is pressure altitude corrected for temperature and humidity.</b></p>	Slide 5-34
<p>It can have a profound effect on aircraft performance. Air, like other gases and liquids, is fluid. It flows and changes shape under pressure. Air is said to be “thin” at higher elevations.</p>	Slide 5-35
<p>There are more air molecules per cubic foot at sea level feet than at 8,500 feet. As density altitude increases, air thins out and aircraft performance decreases. At lower elevations, the rotor blade is cutting through more dense air, which provides additional lift and increased performance.</p>	Slide 5-36
<p>There are three factors that affect density altitude in varying degrees; <b>atmospheric pressure, temperature</b>, and to some degree, humidity.</p> <ul style="list-style-type: none"> <li>• If we change the pressure .10 inches, from 29.92 to 30.92 inches Hg (inches of mercury), we will have a density altitude change of 100 feet.</li> </ul>	Slide 5-37

OUTLINE	AIDS & CUES
<p>Or if the change was an inch in Hg (29.92 to 30.92) that would equal approximately 1,000 feet.</p>	
<p>F. Density Altitude Chart</p>	<p>Slide 5-38</p>
<p><b>Handout Density Altitude Chart.</b></p>	<p>HO-5-1</p>
<p><b>EXERCISE: Density Altitude Chart</b></p>	<p>Slide 5-39</p>
<p><u>Purpose:</u> To have students become familiar how to input pressure altitude - feet and outside air temperature on the chart to get the performance output.</p>	
<p><u>Format:</u> Students groups or classroom</p>	
<p><u>Time:</u> 10 minutes</p>	
<p><u>Materials:</u></p>	
<ul style="list-style-type: none"> <li>• Handout HO-5-1</li> <li>• Slide 5-39</li> </ul>	
<p><u>Instructions:</u></p>	
<p>1. Instruct students to locate and record on their handout the following; pressure altitude - feet and outside air temperature.</p>	
<p>2. Locate the pressure altitude of 6000 feet.</p>	<p>Slide 5-39</p>
<p>3. Locate the outside air temperature of 25 degrees C. Draw a straight vertical line from 25 C. up to where the line intersects the 6000 feet pressure altitude line.</p>	<p>Slide 5-39</p>

OUTLINE	AIDS & CUES
<p>4. From where the 25 C. line intersects the 6000 feet pressure altitude line. Draw a straight horizontal line to the left to the approximate density altitude – thousands of feet line.</p>	<p>Slide 5-39</p>
<p>5. Where that horizontal line intersects the approximate density altitude line is the performance output.</p>	<p>Slide 5-39</p>
<p>6. The helicopter under these conditions will perform as if it were at 8,400 feet.</p>	<p>Slide 5-39</p>
<p>When finished, discuss and answer any questions.</p>	
<p><b><u>End of Exercise.</u></b></p>	
<p>Density Altitude Affects Performance</p>	<p>Slide 5-40</p>
<p>High elevation, high temperature, and high moisture content all contribute to high density altitude conditions and lessen performance.</p>	<p>Slide 5-41 Slide 5-42</p>
<p>Performance is reduced because the thinner air at high density altitudes reduces blade efficiency.</p>	
<p>This in turn requires additional pitch to maintain the same lift capability. The greater pitch angle results in increased drag that requires additional power.</p>	
<p>Unsupercharged piston engines and turbines also operate less efficiently in this less dense air.</p>	
<p><b>Density altitude is the biggest factor when you are hot, high and heavy, be alert!</b></p>	

OUTLINE	AIDS & CUES
<p>III. HELICOPTER LOAD CALCULATIONS</p>	
<p><b>Refer to the IHOG – Chapter 7: Helicopter Load Calculations and Manifests and Appendix A. Exhibits A-8 for detailed information.</b></p>	
<p>A. Load Calculation Form</p> <p>One of the most important documents you will become familiar with is the Load Calculation Form.</p> <p>For a helicopter to fly safely it is critical that you obtain an allowable payload from the Load Calculation form.</p>	<p>Slide 5-43</p>
<p>The AMD-67 and FS-5700-17 load calculation is required for all helicopter flights conducted on interagency fires and project work.</p> <p>For any 5 degree C change in outside air temperature or any 1,000 pressure altitude feet change, a new load calculation will need to be completed to ensure safe operations.</p>	<p>Slide 5-44</p>
<p>Many accidents have happened that involved aircraft that were operating in conditions that were too high or too hot for the weight of the aircraft.</p>	<p>Slide 5-45</p>
<p><b>Hand out and review completed Interagency Helicopter Load Calculation Form.</b></p>	<p>Slide 5-46 HO-5-2</p>

OUTLINE	AIDS & CUES
<p>B. Reading the Form</p> <p>1. Header Information</p> <ul style="list-style-type: none"> <li>• Aircraft model Make and model</li> <li>• N Number Actual aircraft tail number</li> <li>• Mission General mission description</li> <li>• Date/Time When will the mission take place?</li> <li>• Departure Departure location, altitude and temperature</li> <li>• Destination Destination location, altitude and temperature</li> </ul>	<p>Slide 5-47</p>
<p>2. Helicopter equipped weight</p> <p>Found in the weight and balance data in the flight manual.</p>	<p>Slide 5-48</p>

OUTLINE	AIDS & CUES
<p>3. Operating weight</p> <p>Add lines 3, 4, and 5 together to obtain the “operating weight” of the helicopter. Use 7 lbs per gallon for fuel weight.</p>	
<p>4. Computed gross weight</p> <p>The pilot must go to the performance charts to obtain the “computed gross weight.”</p> <p>This reduces the maximum weight allowed, down to the weight that the aircraft can be at the altitude and temperature it is taking off or landing, or conducting high power demand operations, like sling work.</p>	Slide 5-49
<p>5. Weight reduction (download)</p> <p>This set amount of weight is taken off the computed weight.</p> <p>In this way, whenever performance capability has dropped below the limitations of the aircraft, an extra “margin of safety” will be provided.</p> <p>The amount of reduction for each model of aircraft is found in the contract.</p> <p>After the weight reduction is subtracted from the computed gross weight, the “adjusted weight” is recorded in line 9.</p>	

OUTLINE	AIDS & CUES
<p data-bbox="396 283 769 321">6. Gross weight limit</p> <p data-bbox="488 369 1019 489">A limitation to the operation of that aircraft, found in the flight manual, and never to be exceeded.</p> <p data-bbox="488 537 1019 657">Here is an example of a maximum weight limitation for a “non-jettisonable load” for an A-Star B3.</p> <p data-bbox="488 705 1047 909">For this model of helicopter, the non-jettisonable gross weight limitation is a “structural” limitation, not a limitation to the performance capability of the engine.</p> <p data-bbox="488 957 1047 1161">The jettisonable load maximum weight limitation, however, is the maximum weight that the aircraft can sustain in the air, and is the limit of its performance capability.</p> <p data-bbox="488 1209 987 1287">These limitations are entered into line 10 of the form.</p> <p data-bbox="488 1335 1000 1539">Line 9 is your adjusted weight, having been through the “computation” of the performance charts, and with the down load subtracted, if appropriate.</p> <p data-bbox="488 1587 1008 1749">Line 10 is the gross (total) weight limitation of the helicopter for that situation (jettisonable or non-jettisonable).</p>	

OUTLINE	AIDS & CUES
<p>You must choose whichever is less:</p> <p>Line 9 (adjusted weight) or line 10 (the limitation).</p> <ul style="list-style-type: none"> <li>• Allowable Payload – This is the weight of passengers and cargo that can be carried for any mission. The allowable payload is the computed gross weight minus the weight reduction minus the operating weight.</li> <li>• Hover-in-ground-effect. Used at in-ground effect helispots with internal cargo or passengers.</li> <li>• Hover-out-of-ground-effect. Used at out-of-ground effect helispots or external loads that are not jettisonable.</li> </ul> <p style="padding-left: 40px;">Hover-out-of-ground-effect jettisonable. For external jettisonable loads only.</p>	
<p>7. Final Blocks of Load Calculation Form</p> <ul style="list-style-type: none"> <li>• Passengers and cargo</li> </ul> <p style="padding-left: 40px;">Only applicable if load calculation specific to mission</p>	<p>Slide 5-50</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Actual payload Total weight of passengers and cargo</li> <li>• Pilot signature Pilot must sign for load calculation to be valid.</li> <li>• Manager signature Manager must sign for load calculation to be valid.</li> <li>• HazMat Must be identified on the load calculation if on aircraft.</li> </ul>	
<div style="border: 2px solid black; padding: 5px;"> <p><b>Review Unit Objectives.</b></p> <p><b>Hand out unit quiz. Correct quiz as a class.</b></p> </div>	<p>Slide 5-51 Slide 5-52</p> <p>HO-5-3</p>



## UNIT OVERVIEW

<b>Course</b>	Helicopter Crewmember, S-271
<b>Unit</b>	6 – Risk Management and Safety Management System
<b>Time</b>	1 Hour

### Objectives

1. Describe the Risk Management process as applied to helicopter operations.
2. Explain the purpose of the Safety Management System (SMS).

### Strategy

This unit will help students to apply Risk Management techniques to helicopter operations and proficiency checks. This will be accomplished through lecture, and discussion.

### Instructional Methods

- Facilitation/informal lecture with PowerPoint
- Group exercise

### Instructional Aids

- Computer with LCD projector and presentation software
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)

### Exercise

- Risk Management Matrix

### Evaluation Methods

- Review and discuss group exercise.
- Unit 6 Quiz – HO-6-1

## **Outline**

- I. Risk Assessment and Management
- II. Safety Management System (SMS)

## **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: Helicopter Crewmember, S-271

UNIT: 6 – Risk Management

OUTLINE	AIDS & CUES
<p><b>Unit Title Slide.</b></p> <p><b>Present Unit Objectives.</b></p> <p><b>This unit combines the IHOG and IRPG Risk Management Processes.</b></p>	Slide 6-1 Slide 6-2
<p>I. RISK ASSESSMENT AND MANAGEMENT</p> <p>A. What is Risk Assessment?</p> <p>Risk assessment is the process which associates “hazards” with “risks.”</p> <p>Risk assessment is the initial part of the risk management process which includes:</p> <ul style="list-style-type: none"><li>• Identifying know hazards and</li><li>• Analyzing the degree of risk associated with each hazard</li></ul>	Slide 6-3



OUTLINE	AIDS & CUES
<p>Here are some factors that determine hazards:</p> <ul style="list-style-type: none"> <li>• Weather</li> <li>• Time of flight</li> <li>• Terrain – landing areas</li> <li>• Equipment</li> <li>• Wires</li> <li>• Military training area</li> <li>• Take-off and landing weights</li> <li>• Training and proficiency level</li> </ul>	<p>Slide 6-8</p>
<p>Risk Factor that determine hazards are generally divided into four categories, the 4Ms:</p> <ul style="list-style-type: none"> <li>• Man</li> <li>• Machine</li> <li>• Medium</li> <li>• Method</li> </ul>	<p>Slide 6-9</p>
<p>2. Step 2 – Assess the Hazards - Hazard Assessment</p> <p>How should hazards be assessed?</p>	<p>Slide 6-10</p>

OUTLINE	AIDS & CUES
<p>Each hazard should be identified and analyzed by examining:</p> <ol style="list-style-type: none"> <li>1. The effect on personnel/equipment should a hazard be encountered.</li> <li>2. The probability that a hazard will be encountered.</li> </ol>	Slide 6-11
<p>Effect – If a hazard is encountered during a mission, the effect may be:</p> <ul style="list-style-type: none"> <li>• <b>Catastrophic</b> – Death or serious injury</li> <li>• <b>Critical</b> – Serious injury, damaged equipment</li> <li>• <b>Moderate</b> – Mission accomplished, adverse effects</li> <li>• <b>Negligible</b> – No effect, mission accomplished</li> </ul>	Slide 6-12
<p>Probability – The probability of encountering a hazard during a mission may be:</p> <ul style="list-style-type: none"> <li>• <b>Frequent</b> – Continuously or often</li> <li>• <b>Likely</b> – May encounter several times</li> <li>• <b>Occasional</b> – May encounter sporadically</li> </ul>	Slide 6-13

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• <b>Seldom</b> – Encountered infrequently, remote</li> <li>• <b>Unlikely</b> – Rarely, possible, but improbable</li> </ul> <p>How to determine the risk?</p> <ul style="list-style-type: none"> <li>• Determine the severity, probability and exposure with each hazard.</li> <li>• Determine the risk associated with the combined hazards.</li> </ul> <p>Initial assessment may indicate risk level(s) unacceptable. Once controls are implemented, risk level(s) may be at an acceptable level.</p>	<p>Slide 6-14</p>
<p>3. Step 3 – Develop Controls Make Decisions - Hazard Control</p>	<p>Slide 6-15</p>
<p>What is a risk decision?</p> <ul style="list-style-type: none"> <li>• Weigh the risk against the benefits of performing a mission.</li> <li>• Be aware that the mentality, even during non-emergency missions may be mission-oriented (get the job done).</li> </ul>	<p>Slide 6-16</p>

OUTLINE	AIDS & CUES
<p>Risk Decision Tips:</p> <ul style="list-style-type: none"> <li>• Involve operational personnel, especially those impacted by the risk decision.</li> <li>• Apply redundant risk controls when practical and cost effective.</li> <li>• Make risk decisions when benefit out ways the cost.</li> </ul>	<p>Slide 6-17</p>
<p>Who should make a risk decision?</p> <p>Decision should be made at the level that corresponds to the degree of risk associated with that mission.</p> <p>Majority of the decisions that you will be associated with will be made by the Helicopter Manager</p>	<p>Slide 6-18</p>
<ul style="list-style-type: none"> <li>• Extreme High/High Risk Decision (In red and orange)– An extremely high or high-risk decision, which potentially involves the safety of the aircraft and pilot, should be evaluated through the chain of command to the highest level of responsibility for the operation (i.e., the Incident Commander on a fire or the Line Manager for a project mission).</li> </ul>	<p>Slide 6-19 Slide 6-20</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Medium Risk Decision (in green) – A medium-risk decision, which potentially involves extra cost or delays, should be evaluated at a somewhat lower level of command such as the Air Operations Branch Director or the Project Aviation Manager.</li> </ul>	<p>Slide 6-19 Slide 6-20</p>
<ul style="list-style-type: none"> <li>• Low Risk Decision (in blue) – A low-risk decision, which potentially involves little or no effect on the personnel or equipment should be evaluated and determined at the Helibase Manager or Helicopter Manager level.</li> </ul>	<p>Slide 6-19 Slide 6-20</p>
<p>4. Step 4 – Implement Controls/Decision point</p>	<p>Slide 6-21</p>
<p>What are controls?</p>	<p>Slide 6-22</p>
<p>Included in this step is supervisory action to reduce or eliminate hazards.</p>	
<ul style="list-style-type: none"> <li>• A control is any kind of action that is taken to mitigate the risks that have been identified.</li> </ul>	
<ul style="list-style-type: none"> <li>• These controls can range from writing a special-use action plan to simply conducting a short safety briefing.</li> </ul>	

OUTLINE	AIDS & CUES
<p>Once controls are implemented, reassess hazards to ensure that risk(s) have been mitigated to an acceptable level of safety.</p>	<p>Slide 6-23</p>
<p>Incorporate selected controls into:</p> <ul style="list-style-type: none"> <li>• Brief the pilot</li> <li>• Brief personnel</li> <li>• Weigh and prioritize loads</li> <li>• Evaluate helispot</li> </ul>	<p>Slide 6-24</p>
<p>5. Step 5 – Supervise</p>	<p>Slide 6-25</p>
<p>How do you supervise control actions?</p> <ul style="list-style-type: none"> <li>• <b>Brief</b> – to ensure that all personnel know what they are supposed to do.</li> <li>• <b>Follow-up</b> – on instruction to see that people are doing what is expected.</li> <li>• <b>Update</b> – and evaluate the plan continually.</li> <li>• <b>Adjust</b> – or make changes as unforeseen issues arise.</li> <li>• <b>Debrief</b> – after mission is completed.</li> </ul>	<p>Slide 6-26</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• <b>Incorporate</b> – lesson learned for future use.</li> </ul> <div style="border: 2px solid black; padding: 5px; margin: 10px 0;"> <p><b>Ask students if they have any questions about the 5-step process of assessing and managing for risk.</b></p> <p><b>Refer back to the IHOG if necessary.</b></p> </div> <p>II. SAFETY MANAGEMENT SYSTEM (SMS)</p> <p>The ultimate goal of SMS is to provide an organizational framework or roadmap for developing and promoting a true safety culture, ultimately reducing our accident rate.</p> <div style="border: 2px solid black; padding: 5px; margin: 10px 0;"> <p><b>Emphasize to the students that the components listed below encompass the entire aviation program, from the planning to the execution.</b></p> </div> <p>A. Examples of integrated elements or components of an aviation safety system</p> <ul style="list-style-type: none"> <li>• Aircraft and Technology</li> <li>• Training programs</li> <li>• Supervision (span of control)</li> <li>• Aviation Policy</li> <li>• Safety Plans</li> <li>• Communication procedures</li> <li>• Vendor Pilot/Aircraft carding</li> </ul>	<p>Slide 6-27</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Line Officers' oversight</li> <li>• Dedicated Aviation Managers</li> <li>• PPE requirements</li> <li>• SAFECOM (hazard reporting)</li> <li>• ICS and organizational structure</li> <li>• Interagency agreements</li> <li>• Financial Systems</li> <li>• FAA Part 135, 137 standards, etc.</li> <li>• Contract requirements</li> <li>• Pilot and aircraft inspectors</li> <li>• Frequency management</li> </ul>	
<p>B. What does SMS do for us?</p> <ul style="list-style-type: none"> <li>• Takes a proactive, “systemic” (big-picture) approach to managing Aviation safety from all-angles within an organization. In other words it helps you to seek and identify “latent defects”.</li> <li>• Helps identify hazards and control measures to reduce risks (Risk Management Worksheet (RMW), Job Hazard Analysis (JHA), etc.).</li> </ul>	<p>Slide 6-28</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Provides for ongoing “quality assurance” to ensure that risk controls are effective.</li> </ul> <p>C. SMS is based on the following premises:</p> <p>Every person in the organization accepts that safety is a conscious and ongoing mindset as opposed to simply a box to be checked.</p> <p>If we continuously and proactively seek out and eliminate latent defects within our systems and culture, we eliminate potential causal factors that could lead to future accidents.</p>	Slide 6-29
<p>D. Four “Pillars” or Components of SMS</p> <p>1. Safety Policy</p> <ul style="list-style-type: none"> <li>• Agency handbooks, manuals and guides</li> <li>• Organization and position requirements</li> <li>• NWCG position standards, task books</li> <li>• Contract requirements, national/regional/zone aviation plans</li> </ul>	Slide 6-30
<div style="border: 2px solid black; padding: 5px; text-align: center;"> <p><b>Initiate discussion points for each category on the System Safety Assessment Worksheet.</b></p> </div>	

OUTLINE	AIDS & CUES
<p>2. Safety Risk Management</p> <ul style="list-style-type: none"> <li>• RMW and JHAs</li> <li>• Go-No Go checklists</li> <li>• SMS risk assessments</li> <li>• Crew resource management “team decision-making,”</li> <li>• Assignment “turn-down” policy, etc.</li> </ul> <p>3. Safety Assurance</p> <ul style="list-style-type: none"> <li>• Briefings</li> <li>• Training</li> <li>• Fire and Aviation Safety Team (FAST)</li> <li>• Phase Limitations</li> <li>• Check rides/carding requirements</li> <li>• Accident investigations</li> <li>• Program reviews</li> </ul>	

OUTLINE	AIDS & CUES
<p>4. Safety Promotion</p> <ul style="list-style-type: none"><li>• Lessons Learned bulletins</li><li>• Safety Alerts</li><li>• Training</li><li>• Briefings</li><li>• SAFECOM reporting system</li><li>• Airwards</li><li>• Effective Leadership</li><li>• Safety Communication</li></ul>	
<p><b>Review the four pillars on the Aviation Safety Management Systems webpage (<a href="http://www.fs.fed.us/fire/av_safety/index.html">http://www.fs.fed.us/fire/av_safety/index.html</a>).</b></p>	Slide 6-31
<p>E. Negative Organizational and Cultural Influences</p> <p>1. Improper use of SAFECOMs include:</p> <ul style="list-style-type: none"><li>• Failure or delaying to report unsafe acts</li><li>• Information cannot be used to support claims for or against the government.</li></ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• To evaluate contractor performance or award contracts</li> <li>• As a venue for complaints or personal agendas.</li> <li>• Not a substitute for “on-the-spot” correction(s) to a safety concern</li> </ul> <div style="border: 2px solid black; padding: 5px; margin: 10px 0;"> <p><b>Emphasize to students that SAFECOMs are to be used for mishap prevention only. For further information refer to the SAFECOM website <a href="http://www.safecom.gov/">www.safecom.gov/</a></b></p> </div> <ol style="list-style-type: none"> <li>2. Failure to understand or follow policy <ul style="list-style-type: none"> <li>• Policy overload</li> <li>• Conflicting or confusing policy</li> <li>• Lack of accountability and discipline.</li> </ul> </li> <li>3. Fiscal/staffing constraints <ul style="list-style-type: none"> <li>• Outdated equipment</li> <li>• Lack of proper equipment</li> <li>• Lack of qualified personnel (multi-task)</li> </ul> </li> </ol>	

OUTLINE	AIDS & CUES
<p>4. Overemphasis on mission accomplishment vs. safety</p> <ul style="list-style-type: none"> <li>• Management pressure</li> <li>• Critical incident needs</li> <li>• Urban interface</li> </ul>	
<div style="border: 2px solid black; padding: 5px;"> <p><b>Review Unit Objectives.</b></p> <p><b>Hand out unit quiz. Correct quiz as a class.</b></p> </div>	<p>Slide 6-32</p> <p>HO-6-1</p>



## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 7 – Operational Safety

**Lesson** A – General Aviation Safety

**Time** 1 Hour

### Objectives

1. List safety precautions to be observed when working around or flying in a helicopter.
2. Define the requirements and procedures to safely perform special missions.

### Strategy

Through lecture, and class discussion this unit will help students obtain an overall knowledge of general aviation safety, pre-flight and in-flight, aviation watch outs and an overall understanding of special mission safety.

### Instructional Methods

- Facilitation /informal lecture with PowerPoint
- Class discussion

### Instructional Aids

- Computer with presentation software with LCD projector
- Incident Response Pocket Guide (IRPG)

### Exercise

- None

### Evaluation Method

- Cumulative Unit 7 quiz following Lesson 7D.

## **Outline**

- I. General Aviation Safety
- II. Special Mission Safety

## **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: Helicopter Crewmember, S-271

UNIT: 7 – Operational Safety

LESSON: A – General Aviation Safety

OUTLINE	AIDS & CUES
<b>Lesson Title Slide.</b>	Slide 7A-1
<b>Present Lesson Objectives.</b>	Slide 7A-2
<p>The purpose of this unit is to provide you with information and skills to perform your job safely in and around helicopters.</p> <p>Many accidents and incidents could have been prevented if the established policies and procedures were followed.</p> <p>Helicopters are potentially dangerous to all personnel. Through application of the following safety practices, the helicopter operations environment can be safe.</p>	Slide 7A-3
<p>I. GENERAL AVIATION SAFETY</p> <p style="padding-left: 20px;">A. Safety Precautions</p> <ul style="list-style-type: none"> <li>• Helicopter operations will be limited to missions approved on the Aircraft Data Card and the Pilot Qualifications Card. If you have not flown in the aircraft or with the pilot recently you should ask to see both cards. The pilot is required to carry the pilot qualifications card, and the aircraft data card is required to be in the aircraft.</li> </ul>	Slide 7A-4  Slide 7A-5 Slide 7A-6

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Helicopter operations will comply with the user agency manual, Helicopter Contract and Federal and State Occupational Safety and Health Act. Standards applicable to the general safety rules for operations and practices.</li> </ul>	<p>Slide 7A-7 Slide 7A-8 Slide 7A-9</p>
<ul style="list-style-type: none"> <li>• Flight following and flight planning will be in place and conducted based on agency policy.</li> </ul>	<p>Slide 7A-10</p>
<ul style="list-style-type: none"> <li>• Operation of the helicopter will be during daylight hours only. (Defined as one-half hour before sunrise to one-half hour after sunset.)</li> </ul>	<p>Slide 7A-11</p>
<ul style="list-style-type: none"> <li>• Helicopter pilot duty and flight limitations have been established by the agencies in an effort to reduce pilot fatigue. <ul style="list-style-type: none"> <li>– 8 hours flight time/day</li> <li>– 14 consecutive duty hours/day</li> <li>– 10 hours rest between days</li> <li>– 36 hours in 6 days (not to exceed 42)</li> <li>– 2 days off in any 14-day period</li> </ul> </li> </ul>	<p>Slide 7A-12</p>
<ul style="list-style-type: none"> <li>• No unnecessary passengers will be aboard the helicopters.</li> </ul>	<p>Slide 7A-13</p>
<ul style="list-style-type: none"> <li>• Do not allow unnecessary flights.</li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Helicopters shall not be dispatched for mountainous flying when average wind velocity exceeds agency or manufacturer limitations.</li> </ul>	Slide 7A-14
<ul style="list-style-type: none"> <li>• Personal protective equipment required for all missions-available and worn by all ground personnel, passengers and pilot.</li> </ul>	Slide 7A-15
<ul style="list-style-type: none"> <li>• Daily or mission briefing</li> </ul>	Slide 7A-16
<p>Participants</p>	
<ul style="list-style-type: none"> <li>– Pilot</li> </ul>	
<ul style="list-style-type: none"> <li>– Crewmembers</li> </ul>	
<ul style="list-style-type: none"> <li>– Ground personnel</li> </ul>	
<ul style="list-style-type: none"> <li>– Helicopter manager</li> </ul>	
<p>Briefing items</p>	
<ul style="list-style-type: none"> <li>– On the ground and in the air safety precautions</li> </ul>	
<ul style="list-style-type: none"> <li>– Safety plan</li> </ul>	
<ul style="list-style-type: none"> <li>– Hazard map</li> </ul>	
<ul style="list-style-type: none"> <li>– Mission</li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Responsibilities <ul style="list-style-type: none"> <li>Pilot <ul style="list-style-type: none"> <li>– Safe use of the helicopter at all times.</li> <li>– Participate in the helicopter safety program and the efficient use of the aircraft.</li> <li>– Approve all missions; the pilot’s word is final as to whether or not the flight can safely be made.</li> </ul> </li> </ul> </li> </ul>	Slide 7A-17
<ul style="list-style-type: none"> <li>All personnel <ul style="list-style-type: none"> <li>– Ensure mission objectives and hazards are clear and understood.</li> <li>– A passenger may refuse to fly with any pilot or in any aircraft or curtail an existing flight if, in the opinion of the passenger, conditions exist which make the flight unsafe.</li> </ul> </li> </ul>	Slide 7A-18
<p>B. General Helicopter Safety</p> <ul style="list-style-type: none"> <li>• Keep clear of helicopter’s rotors. <ul style="list-style-type: none"> <li>– Unless loading or unloading, stay outside safety circle at all times.</li> </ul> </li> </ul>	Slide 7A-19

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Approach or depart in a slight crouch from front or side in full view of the pilot or as directed by the pilot or helitack personnel.</li> </ul>	Slide 7A-20
<ul style="list-style-type: none"> <li>• Under no circumstances go near the tail rotor of the helicopter.</li> </ul>	Slide 7A-21 Slide 7A-22
<ul style="list-style-type: none"> <li>• Do not approach from or depart to an area where ground is higher than where the helicopter is sitting or hovering.</li> </ul>	Slide 7A-23
<ul style="list-style-type: none"> <li>• Never run when approaching or leaving helicopters.</li> </ul>	Slide 7A-24
<ul style="list-style-type: none"> <li>• Carry equipment parallel to the ground.</li> </ul>	Slide 7A-25
<ul style="list-style-type: none"> <li>• Obtain pilot's approval for all gear stowed in or on the helicopter, especially explosives, flammable, or other hazardous materials.</li> </ul>	Slide 7A-26
<ul style="list-style-type: none"> <li>• Cargo in racks or cargo compartments must be enclosed or tied down securely.</li> </ul>	Slide 7A-27
<ul style="list-style-type: none"> <li>• Know location and operation of doors and emergency exits.</li> </ul>	Slide 7A-28

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Know location and operation of:</li> </ul>	Slide 7A-29
<ul style="list-style-type: none"> <li>– Fire extinguisher</li> </ul> <p>All DOI and Forest Service aircraft must have a hand held minimum 20B:C rated fire extinguisher.</p>	Slide 7A-30
<ul style="list-style-type: none"> <li>– Emergency location transmitter (ELT)</li> </ul> <p>Every aircraft must have an ELT.</p>	Slide 7A-31
<ul style="list-style-type: none"> <li>– First-aid kit</li> </ul> <p>Aircraft owned or operated by DOI and Forest Service are required to carry a first aid kit.</p> <p>The first aid kit must be readily accessible to all occupants in the aircraft.</p>	Slide 7A-32
<ul style="list-style-type: none"> <li>– Survival kit</li> </ul> <p><b>Survival kits are required to be on every agency contracted helicopter at all times per contract.</b></p>	Slide 7A-33
<ul style="list-style-type: none"> <li>– Restraint systems</li> </ul> <p>All aircraft must be equipped with an FAA approved restraint system.</p>	Slide 7A-34

OUTLINE	AIDS & CUES
<p>All restraint systems must have a metal-to-metal buckle or latching mechanism.</p>	
<p>Keep belt fastened during flight.</p>	
<p>Three types of restraint systems:</p> <ul style="list-style-type: none"> <li>• Two-point (No longer used by USFS and DOI)</li> <li>• Three-point</li> <li>• Four-point</li> </ul>	<p>Slide 7A-35 Slide 7A-36</p>
<p>Front seat occupants of a helicopter must have a four-point harness.</p>	
<p>Make sure lap belts are refastened before closing door.</p>	<p>Slide 7A-37</p>
<p>– Fuel and battery shut off</p>	<p>Slide 7A-38</p>
<p>Know location and operation, specifically which to shut-off first in the event of an emergency.</p>	
<ul style="list-style-type: none"> <li>• Use a chin strap or secure hard hat when working close to the helicopter.</li> </ul>	<p>Slide 7A-39</p>
<ul style="list-style-type: none"> <li>• No smoking within 100 feet of helicopter or fuel trucks.</li> </ul>	<p>Slide 7A-40</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• One-wheel, one-skid, hover stepping, or power-on landing will not be performed without written agency approval.</li> </ul>	Slide 7A-41
<p>C. In-Flight Discipline</p>	Slide 7A-42
<ul style="list-style-type: none"> <li>• No moving about in flight; e.g., changing seats.</li> <li>• Keep arms and legs clear of controls and inside helicopter.</li> <li>• Control objects, such as maps so as to not restrict visibility.</li> <li>• Keep hardhat, gloves and other PPE on.</li> </ul>	
<ul style="list-style-type: none"> <li>• Locate the emergency exits and know how to operate. Use only in emergency.</li> <li>• No smoking at any time while in flight.</li> </ul>	Slide 7A-43
<ul style="list-style-type: none"> <li>• Keep alert for aerial hazards, particularly other aircraft and power lines; inform pilot of their presence.</li> </ul>	Slide 7A-44
<ul style="list-style-type: none"> <li>• Always know your location so you may assist in flight following and maintain situational awareness.</li> </ul>	Slide 7A-45
<ul style="list-style-type: none"> <li>• Do not throw objects out of helicopter unless trained in procedures and pilot approval is obtained.</li> </ul>	Slide 7A-46

OUTLINE	AIDS & CUES
<p data-bbox="298 283 943 359">D. Common Questions and Concerns to Consider</p> <div data-bbox="207 415 1052 554" style="border: 2px solid black; padding: 5px; margin: 10px 0;"> <p data-bbox="220 422 1024 541"><b>Refer to IRPG aviation blue section for list of watch out situations. Go through list with students and discuss each situation.</b></p> </div> <p data-bbox="396 602 943 638">1. Aviation Watch out Situations</p> <ul data-bbox="492 688 1040 1787" style="list-style-type: none"> <li data-bbox="492 688 927 724">• Is the flight necessary?</li> <li data-bbox="492 772 857 808">• Who is in charge?</li> <p data-bbox="586 858 1024 978" style="margin-left: 40px;">Are all known hazards identified and have you made them known?</p> <li data-bbox="492 1031 1040 1276">• Should you stop the operation or flight due to change in conditions, communications, confusion, conflicting priorities, weather, turbulence, personnel?</li> <li data-bbox="492 1329 951 1407">• Is this the best way to accomplish the mission?</li> <li data-bbox="492 1459 935 1579">• Are you driven by an overwhelming sense of urgency?</li> <li data-bbox="492 1631 1024 1667">• Can you justify your actions?</li> <li data-bbox="492 1719 1024 1787">• Are there any other aircraft in the area?</li> </ul>	<p data-bbox="1081 283 1260 319">Slide 7A-47</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Do you have an escape route?</li> <li>• Are there any rules being broken?</li> <li>• Are communications getting tense?</li> <li>• Are you deviating from assigned operation or flight?</li> </ul>	
<p>2. Other Questions to Consider</p> <ul style="list-style-type: none"> <li>• Do the risks outweigh the benefits of the operation?</li> <li>• Is there an adequate safety margin?</li> <li>• Has adequate planning been accomplished?</li> <li>• Are the pilot and helicopter carded and equipped for the mission?</li> <li>• Are there sufficient qualified personnel to accomplish the mission?</li> </ul>	<p>Slide 7A-48</p>
<ul style="list-style-type: none"> <li>• Has there been an adequate planning and hazard analysis?</li> <li>• Is there adequate equipment to accomplish the mission?</li> </ul>	<p>Slide 7A-49</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Have all personnel been briefed on the mission and a positive communication established?</li> <li>• Are contingency plans in place for changes due to bad weather or equipment failure?</li> </ul>	
<p>II. SPECIAL MISSION SAFETY</p> <p>A. What Is Special Use?</p> <p>Special use is operations involving the use of helicopters in support of DOI and U.S. Forest Service programs, which require special considerations due to their functional use. Pilot and aircraft must be carded for special mission.</p>	<p>Slide 7A-50</p>
<p><u>Example of Special Use:</u></p> <ul style="list-style-type: none"> <li>• Flying low-level (below 500 ft.)</li> <li>• Mountain flying</li> <li>• Long-line</li> <li>• Aerial ignition</li> <li>• Rappel</li> <li>• ACETA (Aerial Capture, Eradication, Transport of Animals)</li> </ul>	<p>Slide 7A-51</p>

OUTLINE	AIDS & CUES
<p data-bbox="298 283 971 359">B. Pilot and Helicopter Approved For the Mission</p> <p data-bbox="393 411 1045 531">Before any flight, you must ensure the pilot and helicopter are approved for the planned mission.</p> <p data-bbox="393 581 1034 701">Special use activities require that everyone aboard the helicopter wear a full complement of PPE.</p>	<p data-bbox="1081 283 1263 317">Slide 7A-52</p> <p data-bbox="1081 581 1263 615">Slide 7A-53</p>
<div data-bbox="207 751 1052 894" style="border: 2px solid black; padding: 5px;"> <p data-bbox="224 764 464 798"><b>Any questions?</b></p> <p data-bbox="224 848 643 882"><b>Review Lesson Objectives.</b></p> </div>	<p data-bbox="1081 861 1263 894">Slide 7A-54</p>

## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 7 – Operational Safety

**Lesson** B – Briefings and Manifest

**Time** 1 Hour

### Objectives

1. Describe the briefing the HECM should receive from the pilot prior to internal and external cargo operations and passenger transport.
2. Brief the pilot and passengers of flight plans and potential hazards.
3. Describe safe helicopter loading and unloading procedures in a wide variety of aviation environments.
4. Describe the briefing the HECM would provide to the pilot prior to internal and external cargo operations and passenger transport.
5. Prepare a passenger/cargo manifest utilizing the helicopter load calculation form.
6. Describe procedures for in-flight and landing emergencies.
7. Describe key elements of an After Action Review (AAR).

### Strategy

Through lecture, and class discussion this unit will help students obtain an overall knowledge of receiving and giving briefings, loading and unloading procedures, completing an passenger/cargo manifest, in-flight and landing emergency procedures and become familiar with performing an after action review.

### Instructional Methods

- Facilitation /informal lecture supported with slides
- Class discussion

## **Instructional Aids**

- Computer with presentation software with LCD projector
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)
- Interagency Helicopter Passenger/Cargo Manifest Forms OF-252

## **Exercise**

- None

## **Evaluation Methods**

- Review and discuss unit
- Cumulative Unit 7 quiz following Lesson 7D.

## **Outline**

- I. Briefings
- II. Manifest
- III. Debriefing

## **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



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Review a map of the area where the mission will take place prior to take-off.</li> <li>– The map should display: <ul style="list-style-type: none"> <li>○ The intended flight route.</li> <li>○ Temporary flight restrictions</li> <li>○ Military operation areas</li> <li>○ Military training routes</li> <li>○ Known aerial hazards such as power lines, communication towers.</li> </ul> </li> </ul> <p>Failure to attend briefing could lead to assumptions that may compromise safety or completion of mission.</p>	<p>Slide 7B-6</p>
<p>B. Pilot Briefing to the Passengers</p> <p>The pilot is required to brief passenger before the flight as a requirement of Federal Aviation Regulation 135.117. The briefing should include:</p> <ul style="list-style-type: none"> <li>• Smoking restrictions</li> <li>• Use of seatbelts</li> <li>• Emergency exits</li> <li>• Operation of doors</li> </ul>	<p>Slide 7B-7</p> <p>Slide 7B-8</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Fire extinguisher</li> <li>• Supplemental oxygen, if applicable</li> <li>• Placement of seat backs, if applicable</li> <li>• Location of first aid kit, survival kit and Emergency Locator Transmitter (ELT)</li> <li>• Shut-off procedures for battery and fuel</li> </ul>	
<p>C. Crewmember Briefing to Passengers</p> <p>Many times passengers are thinking more about taking a flight instead of the mission at hand and ensuring their own safety. Providing an effective briefing is the first step towards having a safe flight.</p>	Slide 7B-9
<p>It is the responsibility of the person briefing passengers to be familiar with and communicate the specific locations of safety equipment on aircraft to be used.</p>	Slide 7B-10
<ul style="list-style-type: none"> <li>• ELT</li> <li>• First aid kit</li> <li>• Fire extinguishers</li> <li>• Door operation</li> <li>• Seatbelt operation</li> <li>• Fuel and battery shut-off</li> </ul>	Slide 7B-11

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>Emergency landing positions</li> </ul> <div style="border: 2px solid black; padding: 5px; margin: 10px 0;"> <p><b>Refer students to the IRPG blue aviation section and demonstrate a passenger briefing.</b></p> </div>	Slide 7B-12
<p>It is the responsibility of the person giving the briefing to:</p> <ul style="list-style-type: none"> <li>Ensure that all passengers are wearing necessary personal protective equipment.</li> <li>Passenger should stay in a safe area until given direction to load.</li> </ul>	Slide 7B-13
<ul style="list-style-type: none"> <li>Ensure that packs are free of items that could come loose in flight.</li> <li>Ensure tools are properly protected and bundled.</li> </ul>	Slide 7B-14
<p>When loading passengers and equipment:</p> <ul style="list-style-type: none"> <li>Wait for approval from pilot to approach aircraft.</li> <li>Escort and maintain control of personnel to be transported while approaching aircraft.</li> </ul>	Slide 7B-15
<ul style="list-style-type: none"> <li>Make sure passengers are in a crouched position while approaching the aircraft.</li> <li>Make sure all passengers walk around obstacles, and not over.</li> </ul>	Slide 7B-16

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Have passengers place gear at skid of aircraft, load passengers then cargo.</li> <li>• Assist personnel to assigned seats and help fasten seatbelts if needed.</li> </ul>	Slide 7B-17
<ul style="list-style-type: none"> <li>• Have items removed that could impede egress from the aircraft during an emergency.</li> </ul>	Slide 7B-18
<ul style="list-style-type: none"> <li>• Have no loose items, including handheld radios.</li> </ul>	Slide 7B-19
<ul style="list-style-type: none"> <li>• All other cargo will need to be secured in the cargo compartment, or in cargo baskets.</li> </ul>	
<ul style="list-style-type: none"> <li>• Perform a visual inspection to ensure aircraft and passengers are ready for flight.</li> </ul>	Slide 7B-20
<ul style="list-style-type: none"> <li>• Notify pilot that passengers and cargo are ready for flight.</li> </ul>	
<p>Important aspects of in-flight procedures:</p>	Slide 7B-21
<ul style="list-style-type: none"> <li>• Keep clear of controls.</li> <li>• Keep control of maps, gear, especially flying with the doors off.</li> <li>• Be aware of emergency exits and crash positions for make and model.</li> <li>• Sit in assigned seating position. No changing seats.</li> </ul>	

OUTLINE	AIDS & CUES
<p data-bbox="396 283 1040 321">Important aspects of unloading procedures:</p> <ul style="list-style-type: none"> <li data-bbox="396 369 1052 447">• Wait until directed to exit by the pilot or other authorized personnel.</li> <li data-bbox="396 495 992 573">• Only authorized personnel should open doors.</li> <li data-bbox="396 621 1052 747">• When seatbelts are unfastened, check to see they are refastened after passengers have exited.</li> <li data-bbox="396 795 1036 873">• Make sure that appropriate PPE is in place by all passengers.</li> <li data-bbox="396 921 997 959">• Maintain control of personal gear.</li> <li data-bbox="396 1008 1016 1085">• See that passengers exit slowly and in a crouched position.</li> <li data-bbox="396 1134 1029 1257">• Passengers should depart by route specified by authorized personnel to the designated staging area.</li> <li data-bbox="396 1306 1002 1383">• See that personnel stay away from the tail and main rotors.</li> <li data-bbox="396 1432 976 1512">• Personnel need to stay out of the departure path.</li> </ul>	<p data-bbox="1081 283 1260 321">Slide 7B-22</p> <p data-bbox="1081 621 1260 659">Slide 7B-23</p> <p data-bbox="1081 921 1260 959">Slide 7B-24</p> <p data-bbox="1081 1134 1260 1171">Slide 7B-25</p>





**Refer the students to the IRPG white section  
“After Action Review (AAR)” and the IHOG.**

- Post flight evaluation
- What was planned?
- What actually happened?
- Why did it happen?
- What can we do next time?

A post flight debriefing should include all personnel that were pertinent to the mission. An open dialogue with all parties will ensure that **all aspects** of the mission are evaluated.

Be aware that not everyone will evaluate a mission or flight with the same viewpoint. Each individual involved with a mission has a unique perspective. In many cases a flight may seem to go well from one person’s perspective while another individual may have noticed an aspect of the mission that was unsafe.

Identifying areas needing improvement is important. Following up and **correcting** those areas needing improvement is more important.

Following the debriefing, it is important to review the aircraft flight use report with the pilot and verify services provided are correct.

The last item is to sign the document to provide final verification that flight services have been received.

OUTLINE	AIDS & CUES
<p><b>Remember...</b></p> <p><b>The pre-flight briefing sets the stage for a safe mission the debriefing ensures continued success.</b></p>	<p>Slide 7B-34</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>Any Questions?</b></p> <p><b>Review Lesson Objectives.</b></p> </div>	<p>Slide 7B-35 Slide 7B-36</p>

## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 7 – Operational Safety

**Lesson** C – Cargo

**Time** 1 ½ Hours

### Objectives

1. Describe proper procedures for handling hazardous materials.
2. Describe the entire internal cargo transportation process.
3. Describe the process to follow for safe external load operations.

### Strategy

Through lecture, class discussion and hands on exposure this unit helps students obtain an overall knowledge of handling hazardous material for aviation transport, understand how to safely perform internal loads, and how to safely perform external loads utilizing the proper equipment to do so.

### Instructional Methods

- Facilitation /informal lecture supported with slides
- Class discussion

### Instructional Aids

- Computer with presentation software with LCD projector
- Incident Response Pocket Guide (IRPG)
- Interagency Aviation Transport of Hazardous Materials Guide
- Interagency Basic Aviation Safety Publication
- Cargo hook
- Swivel
- Leadline
- Cargo net
- Longline and remote hook

## **Exercise**

- Hazardous Material Transport

## **Evaluation Methods**

- Unit review
- Cumulative Unit 7 quiz following Lesson 7D.

## **Outline**

- I. Hazardous Materials
- II. Internal Cargo
- III. External Loads

## **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
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## UNIT PRESENTATION

COURSE: Helicopter Crewmember, S-271

UNIT: 7 – Operational Safety

LESSON: C – Cargo

OUTLINE	AIDS & CUES
<b>Lesson Title Slide.</b>	Slide 7C-1
<b>Present Lesson Objectives.</b>	Slide 7C-2
<p>I. HAZARDOUS MATERIALS</p> <p style="padding-left: 40px;">A. What Is Hazardous Material?</p> <p style="padding-left: 80px;">A hazardous material is a substance or material which has been determined by the Department of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated.</p> <p style="padding-left: 80px;">Types of hazardous materials and proper transportation procedures can be found in the Interagency Aviation Transport of Hazardous Materials Guide.</p>	<p>Slide 7C-3</p> <p>Slide 7C-4</p>

OUTLINE	AIDS & CUES
<p>Some of the common hazardous materials are:</p> <ul style="list-style-type: none"> <li>• Gasoline</li> <li>• Diesel fuel</li> <li>• Fusees</li> <li>• Batteries</li> <li>• Explosives</li> <li>• Propane (compressed gas)</li> </ul>	<p>Slide 7C-5</p>
<p>B. Transporting Hazardous Materials</p> <p>Hazardous Materials can only be transported in accordance with the Interagency Aviation Transport of Hazardous Materials Guide, NFES 1068. We must transport hazardous materials according to the Guide. Additionally, an exemption is issued by the Department of Transportation in accordance</p>	<p>Slide 7C-6</p>
<p>Both the Guide and the exemption should be onboard the aircraft when transporting hazardous materials.</p> <ul style="list-style-type: none"> <li>• Hazardous materials need to be identified.</li> <li>• Have pilot brief crewmembers on acceptable locations for loading hazardous materials.</li> </ul>	<p>Slide 7C-7</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• On first flight, the pilot shall be notified in writing of HazMat being transported. Can be oral if subsequent flights are transporting same type of HazMat.</li> <li>• Do not transport food items with liquid hazardous materials if at all possible.</li> </ul> <p><b>EXERCISE: Hazardous Material Transport</b></p> <p><u>Purpose:</u> For students to become familiar with the use of the Interagency Aviation Transport of Hazardous Materials Guide (IATHMG).</p> <p><u>Format:</u> Students groups or classroom</p> <p><u>Time:</u> 10-15 minutes</p> <p><u>Materials:</u></p> <ul style="list-style-type: none"> <li>• Interagency Aviation Transport of Hazardous Materials Guide (one per group).</li> </ul> <p><u>Instructions:</u></p> <ol style="list-style-type: none"> <li>1. Assign each student group one or more of the following hazardous materials: chainsaws, fusees, pepper spray, guns, ammunition, batteries, gasoline, and compressed gases.</li> <li>2. Utilizing the IATHMG, each group will look up the correct way to transport their assigned hazardous material(s) in an aircraft.</li> </ol>	<p>Slide 7C-8</p>

OUTLINE	AIDS & CUES
<p>3. Select a spokesperson to inform the class of the proper way to transport the assigned hazardous material(s).</p> <p>4. When finished, review group answers and discuss why it is important to follow this guide.</p> <p><b><u>End of Exercise.</u></b></p>	
<p>II. INTERNAL CARGO</p> <p>A. Internal Cargo Transport Procedures</p> <ul style="list-style-type: none"> <li>• Inspection of cargo</li> <li>• Identifying hazardous materials</li> <li>• Packaging, weighing, securing, and rigging</li> <li>• Manifesting</li> <li>• Obtaining pilot approval</li> <li>• Loading and unloading</li> </ul>	<p>Slide 7C-9</p>
<p>B. Inspection</p> <ul style="list-style-type: none"> <li>• Some items may need to be double bagged or boxed to prevent leakage into the helicopter. Wrap the neck of plastic bags with tape.</li> <li>• Boxes need to be taped and all loose items secured. Smaller items can be taped or tied to larger items to avoid being lost.</li> </ul>	<p>Slide 7C-10</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• If straps or nets are present in the helicopter to secure items, they must be used. Inspect prior to use.</li> <li>• Sharp edges need to be protected to prevent damage to the helicopter or other cargo.</li> <li>• All liquid containers need to be boxed or secured to remain upright.</li> </ul>	Slide 7C-11
<p>C. Weighing Cargo</p> <ul style="list-style-type: none"> <li>• Weigh cargo. Never estimate the weights.</li> <li>• Organize and tag multiple loads with destination and weight.</li> </ul>	Slide 7C-12
<ul style="list-style-type: none"> <li>• Do not exceed weight limits of internal cargo compartments or baskets. Cargo baskets require a detailed briefing on loading and securing gear.</li> </ul>	Slide 7C-13
<p>D. Loading Cargo</p> <ul style="list-style-type: none"> <li>• Pilot must be briefed on destination, weight of cargo, and if there are hazardous materials being transported.</li> <li>• Ensure all weight and balance concerns are addressed.</li> <li>• Follow the pilot's direction for loading and securing all cargo, especially in external baskets.</li> </ul>	Slide 7C-14

OUTLINE	AIDS & CUES
<p>III. EXTERNAL LOADS</p>	<p>Slide 7C-15</p>
<p>A. Why External Loads?</p> <ul style="list-style-type: none"> <li>• No suitable landing area for internal cargo.</li> <li>• No ground vehicle access.</li> <li>• Reduces rotor wash.</li> </ul>	
<ul style="list-style-type: none"> <li>• Reduces number of people involved in operation.</li> <li>• Able to deliver loads without personnel on the ground.</li> </ul>	<p>Slide 7C-16</p>
<ul style="list-style-type: none"> <li>• Bulky or large cargo to be delivered.</li> <li>• Loads can be pre-packaged to reduce loading and unloading time.</li> </ul>	<p>Slide 7C-17</p>
<p>The safe and efficient transport of external loads relies on standard procedures being followed correctly.</p>	<p>Slide 7C-18</p>
<p>Rigging an external load improperly can be disastrous to the pilot, the aircraft, and personnel on the ground.</p>	
<ul style="list-style-type: none"> <li>• Only persons essential to the operation should be positioned beneath a hovering helicopter; i.e., external loads, slinging, bucket work.</li> <li>• Flying aboard the helicopter with an external load shall comply with agency policy.</li> </ul>	<p>Slide 7C-19</p>

OUTLINE	AIDS & CUES
<p><b>Remember – Check, and then double check!</b></p> <p>If it’s wrong on the ground, it will only get worse in the air.</p> <p><b>Refer students to the Height Velocity Diagram in the Basic Aviation Safety Guide.</b></p>	<p>Slide 7C-20</p>
<p>B. Height Velocity Diagram</p> <p><b>Start some interaction by asking students the following:</b></p> <p>Where on the diagram would they find a helicopter with a sling load connected to a cargo hook, 150-foot AGL and with 20 knots of airspeed as it’s approaching a sling site?</p>	<p>Slide 7C-21</p>
<p><b>They are in the shaded area in the dead man’s curve.</b></p> <p><b>Have students consider the following:</b></p> <ul style="list-style-type: none"> <li>• This is a typical environment that pilots and aircraft are asked to work in for natural resource missions.</li> <li>• The height velocity diagram does not factor in the time it takes for the pilot to release the load and initiate an autorotation maneuver.</li> </ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Time spent in the shaded area reduces the safety margin and limits the pilot's options.</li> <li>• The risks of low-level maneuvers and extended hovers.</li> </ul> <p>C. Prior to External Load Mission</p> <p>Before any external load mission ensure:</p> <ul style="list-style-type: none"> <li>• A risk management process has been completed at the appropriate level.</li> <li>• The pilot is qualified and the aircraft is equipped for the mission.</li> <li>• A load calculation is completed for current conditions.</li> </ul>	<p>Slide 7C-22</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>The IRPG may be useful when weighing cargo when no scale is available. Reference Weight Estimates of the blue pages.</b></p> </div>	
<ul style="list-style-type: none"> <li>• All cargo has been weighed and manifested. Do weights include: Remote hook, net, swivel, and line weight?</li> <li>• Ensure total weight on manifest is less than HOGE-J allowable payload for specific aircraft.</li> <li>• Submit manifest to helicopter or helibase manager at the end of shift.</li> </ul>	<p>Slide 7C-23</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Hazardous materials have been identified and packaged properly.</li> <li>• Pilot must be briefed on destination, weight of cargo, and if there are hazardous materials being transported.</li> <li>• Pilot has approved of cargo to be transported.</li> </ul>	Slide 7C-24
<ul style="list-style-type: none"> <li>• Cargo has been inspected, secured, and packaged properly.</li> <li>• Multiple loads have been identified and tagged according to destination.</li> </ul>	Slide 7C-25
<ul style="list-style-type: none"> <li>• Length of longline required for mission.</li> <li>• Personnel are qualified and minimum staffing requirements are met.</li> </ul>	Slide 7C-26
<p>D. Preparing Sling Loads</p> <p>Preparing slings to be flown</p> <ul style="list-style-type: none"> <li>• Inspection <ul style="list-style-type: none"> <li>– Bag and/or box items to prevent leaking.</li> <li>– Tape boxes and secure loose items.</li> <li>– Protect sharp edges.</li> </ul> </li> </ul>	Slide 7C-27

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Place liquid containers in upright position.</li> <li>– Cushion fragile items.</li> <li>– Daisy chain will require a swivel for each load attached.</li> </ul>	
<ul style="list-style-type: none"> <li>• Hazardous Materials <ul style="list-style-type: none"> <li>– HazMat identified, packaged and transported in accordance with Interagency Transport of Hazardous Materials Guide, NFES 1068.</li> <li>– Pilot must be notified verbally of the type and quantity of hazardous materials.</li> </ul> </li> </ul>	Slide 7C-28
<ul style="list-style-type: none"> <li>• Weighing Cargo <ul style="list-style-type: none"> <li>– Cargo must be weighed and manifested.</li> <li>– Tag loads with weight and destination.</li> <li>– Do not exceed helicopter's allowable payload.</li> </ul> </li> </ul>	Slide 7C-29
<ul style="list-style-type: none"> <li>• Loading Nets <ul style="list-style-type: none"> <li>– Place heavy/bulky items in center of net.</li> <li>– Build loads in pyramid shape.</li> </ul> </li> </ul>	Slide 7C-30

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Do not over-bulk net.</li> <li>– Pull metal rings on perimeter rope to equal lengths.</li> <li>– Do not “stitch” or “weave.”</li> <li>– Add ballast (rocks, tools, etc.) to light loads.</li> <li>– Every load gets a swivel.</li> </ul>	Slide 7C-31
<p>E. Assessing Sling Sites</p> <p>1. Assessment Process</p> <ul style="list-style-type: none"> <li>• Identify trees or snags that would pose a threat to the mission.</li> <li>• Gauge height of surrounding obstacles to determine length of longline needed.</li> </ul>	Slide 7C-32
<p>2. The Compass Process</p> <p>a. To use a compass, back up from the tree or hazard along level ground or along a line of elevation so that the top is roughly at a 45 degree angle above you.</p> <p>b. Set the compass bezel to 315* degrees. *(360-45=315)</p>	Slide 7C-33

OUTLINE	AIDS & CUES
c. The north-south axis of the compass becomes your horizon line.	
d. Eye the top of the tree or hazard along the edge of the compass.	Slide 7C-34
e. Adjust your position to get an exact 45 degree angle.	Slide 7C-35
f. Have a partner help in adjusting the compass and your position to get the angle right.	
g. Once you have a 45 degree angle and the top of the hazard lines up with the edge of the compass, pace the distance from that point back to the base of the tree or hazard.	Slide 7C-36
h. It is important to walk a direct line with no ups and downs.	
i. Don't gauge the height from higher to lower ground. Need to be level with the base of the tree or hazard.	
j. Know the length of your pace.	
k. Add your height to the paced distance, which will equal tree height.	



OUTLINE	AIDS & CUES
<p>c. Once you have it on the ground, measure it by using the pacing method.</p> <p>d. From that measurement, should be able to determine the general heights of surrounding trees.</p> <p>F. Equipment</p> <p>The following is an introduction to the basics of the equipment used. Your instructor will provide more detail during the field exercises.</p>	<p>Slide 7C-40</p>
<p><b>Make available for the students the following equipment:</b></p>	
<p>1. The Cargo Hook</p> <ul style="list-style-type: none"> <li>• The cargo hook is attached to the belly of the helicopter, and can be manually or electrically released by the pilot from the cockpit.</li> <li>• It is self-cocking and has an automatic locking function.</li> <li>• Check pilot's manual cable, electrical and manual release before each use to ensure serviceability.</li> <li>• Inspect for damage and wear before use.</li> </ul>	<p>Slide 7C-41</p>

OUTLINE	AIDS & CUES
<p data-bbox="391 281 662 317">2. The Swivel</p> <div data-bbox="207 369 1052 512" style="border: 2px solid black; padding: 5px;"> <p data-bbox="220 380 1023 499"><b>Mention that only the yellow swivels are approved for use. The older keeper gate types are no longer in use.</b></p> </div> <ul data-bbox="492 562 1040 1619" style="list-style-type: none"> <li data-bbox="492 562 1040 722">• Consists of a ring or link on the upper end, a hook on the lower end, and a swivel section in between.</li> <li data-bbox="492 772 1040 978">• Allows the load to rotate in flight to reduce twisting of the leads, preventing damage to the cargo hook or an inadvertent release.</li> <li data-bbox="492 1029 1040 1150">• Always the link between a cargo remote hook and an external load, <u>always</u>.</li> <li data-bbox="492 1201 1040 1281">• Must have a rated capacity stamped on the swivel.</li> <li data-bbox="492 1331 1040 1453">• The swivel action must be verified and inspected before use.</li> <li data-bbox="492 1503 1040 1625">• The keeper-gate must be checked before use for serviceability.</li> </ul> <p data-bbox="391 1667 688 1703">3. The Leadline</p> <ul data-bbox="492 1753 1040 1875" style="list-style-type: none"> <li data-bbox="492 1753 1040 1875">• Connects the load to the helicopter or multiple loads together.</li> </ul>	<p data-bbox="1081 281 1260 317">Slide 7C-42</p> <p data-bbox="1081 1331 1260 1367">Slide 7C-43</p> <p data-bbox="1081 1667 1260 1747">Slide 7C-44 Slide 7C-45</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Consists of a flexible cable with a swaged hook and keeper-gate on one end, and a swaged ring or link on the other.</li> <li>• Must be inspected before use, and retired if unserviceable.</li> </ul>	
<p>4. The Cargo Net</p> <ul style="list-style-type: none"> <li>• Comes in round and square configurations.</li> <li>• The perimeter ropes cinch up in a purse string arrangement to hold the cargo.</li> <li>• The rope ends have steel rings, which are the attachment points for a swivel.</li> </ul>	Slide 7C-46
<ul style="list-style-type: none"> <li>• Require inspection for wear or damage.</li> </ul>	Slide 7C-47
<p>5. The Longline and Remote Hook</p> <ul style="list-style-type: none"> <li>• Consist of sections of steel cable or Kevlar rope with an electrical cable to provide power to a remote hook.</li> <li>• Constructed of anti-twist cable, generally in 50-foot sections, which can be added together to meet mission requirement.</li> </ul>	Slide 7C-48

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Remote hook has manual and electrical releases.</li> <li>• Attaches to the cargo hook and uses an electrical pigtail to connect to the helicopter.</li> <li>• Must be inspected for kinks and damage.</li> <li>• Releases checked before each use.</li> <li>• Do not use swivel for link to cargo hook!</li> </ul>	
<p>G. External Load Operations</p> <p>1. Mission Preparation</p>	<p>Slide 7C-49</p>
<ul style="list-style-type: none"> <li>• It is imperative a good briefing be provided to all personnel involved.</li> <li>• Pilot/aircraft approved for mission.</li> <li>• Load calculation completed.</li> <li>• Cargo weighed and manifested.</li> <li>• Hazardous materials packaged and labeled.</li> </ul>	<p>Slide 7C-50</p>
<ul style="list-style-type: none"> <li>• Personnel qualified, minimum staffing.</li> </ul>	<p>Slide 7C-51</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Cargo packaged, inspected and secured.</li> <li>• Pilot has approved cargo.</li> <li>• Loads identified and tagged for destination.</li> <li>• Sling/rigging equipment designed for load.</li> <li>• Flight following and crash/rescue procedures established.</li> <li>• Radios operational with correct frequencies.</li> <li>• Ground and flight hazards identified.</li> </ul>	<p>Slide 7C-52</p>
<p>Identify Hazards</p> <ul style="list-style-type: none"> <li>• Wires</li> <li>• Obstructions in the approach and departure paths</li> <li>• Tall trees and snags</li> <li>• Weather</li> <li>• Other aircraft in area</li> <li>• Wrong helicopter for mission</li> </ul>	<p>Slide 7C-53</p>
<p>Are identified hazards known to all?</p>	



OUTLINE	AIDS & CUES
<p>3. Hover Hook-Up</p>	<p>Slide 7C-56</p>
<ul style="list-style-type: none"> <li>• Preparation <ul style="list-style-type: none"> <li>- Proper PPE</li> <li>- Two people recommended one with radio.</li> <li>- Emergency procedures established.</li> <li>- Crash/rescues procedures identified.</li> <li>- Site preparation completed.</li> <li>- Keep area clear of unauthorized personnel.</li> </ul> </li> </ul>	<p>Slide 7C-57</p>
<ul style="list-style-type: none"> <li>• Procedures <ul style="list-style-type: none"> <li>- The hook-up person should stand facing the helicopter with the swivel extended overhead.</li> <li>- The parking tender should direct the pilot with hand signals and radio communication.</li> </ul> </li> </ul>	<p>Slide 7C-58</p>

OUTLINE	AIDS & CUES
<p>A radio/flight helmet interface is recommended for positive two-way communication.</p> <ul style="list-style-type: none"> <li>- The pilot should approach the hook-up person and come to a hover over them. Keep hover to a minimum.</li> <li>- The hook-up person will attach the load, turn and walk towards the parking tender, and then turn to face the helicopter and kneel down.</li> </ul>	<p>Slide 7C-59</p>
<p><b>Never cross underneath skid of helicopter.</b></p> <ul style="list-style-type: none"> <li>- The parking tender will signal to begin movement of the load. Checks line for entanglement.</li> <li>- When the load has cleared any obstacles, give the pilot the “clear to depart” signal.</li> </ul>	<p>Slide 7C-60</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>- Parking tender should continue to check the load visually, and inform the pilot of any problems.</li> <li>- Loads can also be attached to the cargo hook, when the helicopter is on the ground.</li> </ul>	
<div style="border: 2px solid black; padding: 5px;"><b>Review the Standard Helicopter Hand Signals out of the IRPG.</b></div>	Slide 7C-61
<p style="text-align: center;"><b>Remember – Check and then double check!</b></p> <p style="text-align: center;"><b>If it's wrong on the ground, it will only get worse in the air.</b></p>	Slide 7C-62
<div style="border: 2px solid black; padding: 5px;"><b>Any Questions?</b></div> <div style="border: 2px solid black; padding: 5px;"><b>Review Lesson Objectives.</b></div>	Slide 7C-63

## UNIT OVERVIEW

<b>Course</b>	Helicopter Crewmember, S-271
<b>Unit</b>	7 – Operational Safety
<b>Lesson</b>	D – Parking Tender and Miscellaneous Roles and Responsibilities
<b>Time</b>	1 ½ Hours

### Objectives

1. Describe parking tender roles and responsibilities.
2. Describe the plan for medivac procedures.

### Strategy

Through lecture, and class discussion this unit will help students obtain an overall knowledge of performing the roles and responsibilities of a parking tender, applying and activating an emergency plan, understand and follow procedures/protocols for aviation emergencies and utilization and submission of a SAFECOM.

### Instructional Methods

- Facilitation/informal lecture with PowerPoint
- Group exercises

### Instructional Aids

- Computer with presentation software with LCD projector
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)
- Unit 1 IAP

### Exercise

- None

### Evaluation Method

- Unit (7A-7D) Quiz – HO-7D-1

## **Outline**

- I. Parking Tender
- II. Medical Evacuation
- III. Aviation Mishap Types

## **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: Helicopter Crewmember, S-271

UNIT: 7 – Operational Safety

LESSON: D – Parking Tender and Miscellaneous Roles and Responsibilities

OUTLINE	AIDS & CUES
<b>Lesson Title Slide.</b>	Slide 7D-1
<b>Review Lesson Objectives.</b>	Slide 7D-2
I. PARKING TENDER	Slide 7D-3
The parking tender provides safety and oversight for all operations occurring within the safety circle of the helicopter.	
A. Personal Protective Equipment (PPE)	Slide 7D-4
It is essential that you wear all personal protective equipment including a:	
<ul style="list-style-type: none"><li>• Non-flammable high visibility vest</li></ul>	
B. Roles and responsibilities	Slide 7D-5
1. Obtain briefing from appropriate supervisor; obtain radio frequencies and other information necessary to perform the job.	

OUTLINE	AIDS & CUES
<p>2. Whenever the assigned helicopter's engine is running, or whenever it is approaching or departing the parking spot, supervise activities at the assigned landing pad, including personnel, ground vehicle, and helicopter movement. Keep unauthorized people out of safety circle.</p>	
<p>3. Know and understand crash-rescue procedures; ensure that extinguishers are placed at the landing pad; be responsible for extinguisher operation in the event of the fire either on landing, takeoff, or refueling.</p>	Slide 7D-6
<p>4. Ensure touchdown pad is properly prepared, numbered, and maintained.</p>	
<p>5. Ensure there is adequate communication(s).</p>	
<p>6. Provide wind advisories and other landing, takeoff, and holding directions to the pilot.</p>	Slide 7D-7
<p>7. Communication with the pilot may be done either through hand signals or by way of radio communication.</p>	
<p>8. Parking tender should be positioned outside the safety circle.</p>	
<p>9. Be alert for potential conflicts between inbound and/or outbound aircraft.</p>	Slide 7D-8

OUTLINE	AIDS & CUES
<p>10. Coordinate with loadmasters on the loading and unloading of personnel and cargo; ensure that loading personnel check personal seatbelts, cargo restraints, and helicopter doors prior to departing the area.</p> <p>11. Monitor the fueling of helicopters.</p> <p>12. Immediately report any problems.</p>	
<p>C. Safety Precautions While Refueling</p> <ul style="list-style-type: none"> <li>• A parking tender's job is to observe and maintain safety circle.</li> <li>• Keep out other vehicles and people.</li> <li>• Stage at fire extinguisher in the event of a fueling fire.</li> <li>• Parking tender should also know the positions and operation of emergency shut-off valve on fuel truck.</li> </ul>	<p>Slide 7D-9</p>
<ul style="list-style-type: none"> <li>• Fueling the helicopter is primarily the contractor's responsibility.</li> <li>• Helicopter and fuel containers will be bonded.</li> <li>• There will be no passengers aboard.</li> <li>• No smoking or unauthorized personnel will be within 50 feet.</li> </ul>	<p>Slide 7D-10</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Rotor and engines will be stopped except for when agency approval is given for re-fueling operations.</li> </ul>	
<p>D. Emergency Procedures – Take-off and Landing Area</p>	Slide 7D-11
<ul style="list-style-type: none"> <li>• Clear landing areas, including: personnel, other aircraft, and vehicles.</li> <li>• Be familiar with the use and application of: <ul style="list-style-type: none"> <li>– Crash Rescue Kit, NFES #1040. For entry and extrication.</li> <li>– Evacuation Kit, NFES #0650. Includes stokes combined package litter and 25-person first aid kit.</li> <li>– Fire extinguisher, 40 lb 20-B-C</li> </ul> </li> </ul>	Slide 7D-12
<p>Emergency Plan</p> <ul style="list-style-type: none"> <li>• Activate Local Emergency Plan, it should include the following information: <ul style="list-style-type: none"> <li>– How to contact specialized crash/fire rescue units.</li> <li>– Specialized medical facilities available such as burn and head injury treatment facilities.</li> </ul> </li> </ul>	Slide 7D-13

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>– Transportation methods available.</li> <li>– Bureau or agency notification procedures.</li> <li>– Refer to pre-accident plan for local specific actions.</li> </ul> <p style="text-align: center;"><b>Only respond to aircraft accident if properly trained and briefed on procedures.</b></p>	<p>Slide 7D-14</p>
<p>II. MEDICAL EVACUATION</p> <p>Medical evacuation plans can be found in the incident action plan (IAP) and/or project aviation safety plan.</p> <p>It is a pre-determined plan that provides procedures and protocols for crash rescue, medivac and helicopter evacuation missions.</p> <p>The plan should be posted on the helibase information board and reviewed with all personnel involved.</p>	<p>Slide 7D-15</p>
<p><b>Review a HJA-4 (Crash Rescue/Medivac/ Evacuation Plan) located in IHOG. (Specifically VI Accident Response at Helibase). Discuss roles and responsibilities of helicopter crewmembers and plan.</b></p>	<p>Slide 7D-16</p>
<p><b>Review the IAP handed out in Unit 1. Discuss what is in the medivac plan.</b></p>	

OUTLINE	AIDS & CUES
<p>If crash rescue personnel are performing the evacuation, it is critical that the helibase aircraft base radio operator or other individual assigned be making the contacts identified in the Medical Unit Plan and/or in Form HJA-4, Crash Rescue/Medivac/Evacuation Plan. Note that for project operations, initial contact is usually made with the local dispatch office, which will implement the unit accident preparedness plan.</p> <p>Helicopter pilots, crews, and helibase personnel should all be briefed on roles, responsibilities, and procedures.</p> <p>Coordinate closely with the local dispatch or other responsible office both in preparedness planning and during the actual evacuation.</p>	<p>Slide 7D-17</p>
<p>III. AVIATION MISHAP TYPES</p> <p>A. Aircraft Accident</p> <p>An aircraft accident is an occurrence associated with the operation of an aircraft, which takes place between the time any person boards the aircraft with the intention of flight and the time all such persons have disembarked, and in which any person suffers death or serious injury or in which the aircraft receives substantial damage. (350DM 1, FSM 5700)</p>	<p>Slide 7D-18</p>

OUTLINE	AIDS & CUES
<p>1. Incident with Potential</p> <ul style="list-style-type: none"> <li>• An incident that narrowly misses being an accident and which the circumstances indicate serious potential for damage or injury.</li> <li>• Classification of incidents with potential are determined by Aviation Safety Managers. (350DM 1, FSM 5700)</li> </ul>	Slide 7D-19
<p>2. Aircraft Incident</p> <p>An occurrence, other than an accident, associated with the operation of an aircraft that effects, or could affect the safety of operations or the mission. (350 DM 1)</p>	Slide 7D-20
<p>3. Aviation Hazard</p> <p>Any condition, act or set of circumstances that exposes an individual to unnecessary risk or harm during aviation operations. (350 DM 1)</p>	Slide 7D-21
<ul style="list-style-type: none"> <li>• A policy or procedure deviation.</li> <li>• Unsafe actions of pilots, mechanics, fuel handlers, support personnel, aviation user or manager.</li> </ul>	Slide 7D-22

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Deviation from planned flight operations.</li> <li>• Failure to use required PPE, file a flight plan, use flight following procedures, or to conduct required load calculations or downloading.</li> </ul>	
<p>4. Maintenance Deficiency</p> <p>A maintenance deficiency report is any serious defect or failure causing mechanical difficulties encountered in aircraft operations and not specifically identified as an aircraft incident or aviation hazard.</p>	Slide 7D-23
<p>5. Communicating Mishaps</p>	Slide 7D-24
<p>SAFECOM</p> <ul style="list-style-type: none"> <li>• A reporting form to communicate any condition, act, maintenance problem or circumstance which has potential to cause an aviation related mishap.</li> <li>• Online searchable database of past events.</li> </ul>	Slide 7D-25

OUTLINE	AIDS & CUES
<p>Take Home Message</p> <ul style="list-style-type: none"> <li>• If you see something, say it.</li> <li>• As a new Helicopter Crewmember you may be the one to prevent a serious accident.</li> </ul>	<p>Slide 7D-26</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>Any questions?</b></p> <p><b>Review Lesson Objectives.</b></p> <p><b>Hand out unit quiz (covers lessons 7A-7D). Correct quiz as a class.</b></p> </div>	<p>Slide 7D-27</p> <p>HO-7D-1</p>



## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 8 – Helispot Operations

**Time** 1 ½ Hours

### Objectives

1. Describe the process for staffing and preparing a landing area or helispot.
2. Define the methods for constructing landing areas or helispots.
3. Describe the duties performed in managing a helispot.

### Strategy

This unit will help students to define the duties associated with helispot management from the beginning of preparing a landing area and the management of the helispot. This will be accomplished through lecture, discussion, and hands-on exercises.

### Instructional Methods

- Facilitation/informal lecture with PowerPoint
- Group exercises

### Instructional Aids

- Computer with LCD projector and presentation software
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)

### Exercises

- Helispot Exercise
- Risk Management Applied

### Evaluation Methods

- Review and discuss group exercises.
- Unit 8 Quiz – HO-8-1

## **Outline**

- I. Take-off and Landing Areas
- II. Helispot Construction
- III. Helispot Manager Duties And Responsibilities

## **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: Helicopter Crewmember, S-271

UNIT: 8 – Helispot Operations

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>	Slide 8-1
<b>Present Unit Objectives.</b>	Slide 8-2
I. TAKE-OFF AND LANDING AREAS	Slide 8-3
A. Heliport	Slide 8-4
Permanent facility built to FAA standards typically found at hospitals, city, and county facilities.	
Heliport Components:	
<ul style="list-style-type: none"><li>• Permanent pad</li><li>• Wind indicator</li><li>• Road access</li><li>• Parking area</li><li>• Communications</li><li>• Rest area (pilot and crew)</li></ul>	

OUTLINE	AIDS & CUES
<p>B. Permanent Helibase</p> <p>Have the same the components of a heliport.</p> <p>Permanent Helibase Components:</p> <ul style="list-style-type: none"> <li>• Permanent pad</li> <li>• Wind indicator</li> <li>• Road access</li> <li>• Parking area</li> <li>• Communications</li> <li>• Rest area (pilot and crew)</li> </ul>	<p>Slide 8-5</p>
<p>C. Temporary Helibase</p> <p>Are established for a short duration.</p> <p>Temporary Helibase Components:</p> <ul style="list-style-type: none"> <li>• Communications</li> <li>• Road access</li> <li>• Parking areas</li> <li>• Landing pads</li> <li>• Wind indicator</li> <li>• Rest area (pilot and crew)</li> <li>• Staging area (passengers/cargo)</li> </ul>	<p>Slide 8-6</p>

OUTLINE	AIDS & CUES
<p>D. Helispot</p> <p>Are natural or improved take-off and landing areas for temporary use.</p> <p>Helispot Components:</p> <ul style="list-style-type: none"> <li>• Communications</li> <li>• Landing pads</li> <li>• Wind indicator</li> <li>• Fire extinguisher</li> <li>• Crash rescue kit</li> <li>• Staging area (passengers/cargo)</li> </ul> <p>A helispot might not have:</p> <ul style="list-style-type: none"> <li>• Road access</li> </ul>	<p>Slide 8-7</p>
<p>E. Unimproved Landing Area</p> <p>Intended for one time use only and at the discretion of the pilot.</p> <p>Unimproved landing areas are not intended for multiple uses.</p> <p>If it is to be used on a recurring basis, necessary improvements should be made, and it should be referred to thereafter as a helispot.</p>	<p>Slide 8-8</p>

OUTLINE	AIDS & CUES
<p>The pilot is responsible for making the decision to utilize unimproved landing sites. The government representative on board may make a recommendation, but must defer to the pilot's judgment, even if the pilot's preferred site is at a distance from that desired.</p> <p>Conversely, the government representative has the option to advise the pilot that he or she does not feel comfortable landing at a site selected. Examples of this type of landing area would be sites selected by the pilot for an emergency rescue, inspection of aircraft due to mechanical problems (chip light, rotor strike, etc.). The point being that no subsequent landings will occur again in this area.</p> <p>Prior to landing for the first time at an unimproved site, the pilot shall make a high-level reconnaissance of the area to determine the location of any aerial hazards in the approach or departure path and to determine wind conditions, slope, ground stability, rotor clearances, ground hazards, and size of pad.</p> <p>F. Take-off and Landing Area</p> <p>This a specific area in which the helicopter actually lands and takes off, including the touchdown pad and safety circle.</p>	<p>Slide 8-9</p>

OUTLINE	AIDS & CUES
<p>G. Safety Circle</p> <p>A safety circle is a zone that provides an obstruction-free area on all sides of the touchdown pad. For helispots and helibases, the only items that should be within the safety circle are a fire extinguisher, a pad marker, and if applicable, external or internal loads awaiting transport. The parking tender may also be within the safety circle.</p> <p>The size of the safety circle will depend on the size of the helicopter. But as a rule of thumb, it should be at least one and one-half times the diameter of the rotor.</p>	<p>Slide 8-10</p>
<p>H. Touchdown Pad</p> <p>This is the specific location where the skids or wheels will come to rest. Usually has a prepared or improved surface, on a heliport, airport, takeoff/landing area, apron/ramp, or movement area used for takeoff, landing or parking of helicopters.</p>	<p>Slide 8-11</p>
<p>I. Standard Landing Area Size</p> <p><b>Type 3 (light helicopters):</b></p> <ul style="list-style-type: none"> <li>• Safety circle should be at least 75 feet in diameter.</li> <li>• Touchdown pad is 15 by 15 feet.</li> </ul>	<p>Slide 8-12</p>

OUTLINE	AIDS & CUES
<p><b>Type 2 (medium helicopters):</b></p> <ul style="list-style-type: none"> <li>• Safety circle should be at least 90 feet in diameter.</li> <li>• Touchdown pad is 20 by 20 feet.</li> </ul> <p><b>Type 1 (heavy helicopters):</b></p> <ul style="list-style-type: none"> <li>• Safety circle should be at least 110 feet in diameter.</li> <li>• Touchdown pad is 30 by 30 feet.</li> </ul>	
<p>II. HELISPOT CONSTRUCTION</p>	
<p>A. Selecting a Helispot Site</p>	<p>Slide 8-13</p>
<p><u>Ideal:</u> 2-way approach/departure path</p> <ul style="list-style-type: none"> <li>• Ridge tops or exposed knobs</li> <li>• HIGE</li> <li>• Level pad</li> <li>• No obstructions</li> <li>• Requires minimum labor</li> <li>• Close to work area or incident</li> <li>• Natural dust abatement</li> </ul>	
<ul style="list-style-type: none"> <li>• Proximity to safety zone</li> <li>• Ensure LCES can be established</li> </ul>	<p>Slide 8-14</p>

OUTLINE	AIDS & CUES
<p>Always attempt to locate the area so that takeoffs and landings may be executed into the prevailing winds. Avoid if at all possible one way helispots. This becomes more important with higher elevations.</p> <p>Ridge tops and exposed knobs offer the best locations, especially if they can be approached and departed from in all or several directions.</p> <p>If possible, avoid locating the landing and takeoff area on a slope.</p> <p>Area that will require minimum labor to bring to proper standards.</p> <p>Area must be clear of people, vehicles, and obstructions such as trees, poles, and especially overhead wires. The area must be free of stumps, brush, posts, large rocks or anything over 18 inches high.</p> <p>Address LCES prior to staffing existing or proposed helicopter landing areas.</p>	
<p>B. Helispot Site Situations to Avoid</p> <ul style="list-style-type: none"> <li>• Helispots that require that same approach and departure paths (one-way helispots) should be avoided whenever, possible.</li> <li>• Freshly cut dozer lines (dust)</li> <li>• Rocky touchdown pads (tank clearance, skid damage)</li> </ul>	<p>Slide 8-15</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Sites that are HOGE limited (height/velocity curve)</li> <li>• Dusty locations which cause visibility problems; flying debris, dust and particles get ingested into the helicopter engines. Injuries to personnel can be caused by loose objects. Always provide for dust abatement before using these types of helispots.</li> <li>• Aerial hazards (cannot be seen from air)</li> <li>• Tall grass (lessens ground effect, conceals hazards)</li> <li>• Tundra and boggy areas (dynamic rollover)</li> <li>• Sloping touchdown pads (dynamic rollover)</li> <li>• Lee side turbulence (downdrafts, wind shear)</li> <li>• Trash and debris (foreign object damage)</li> <li>• Pinnacles requiring high power-on landings (tailbooms become inaccessible for loading and unloading cargo)</li> <li>• Nearby commercial flight patterns</li> <li>• Nearby populated area</li> </ul>	<p>Slide 8-16</p>

OUTLINE	AIDS & CUES
<p>C. Approach and Departure Path</p> <ul style="list-style-type: none"> <li>• 2-way approach/departure</li> <li>• Width same as safety circle</li> <li>• Obstruction free (300' approach by 300' departure)</li> <li>• Into prevailing wind</li> </ul> <p>This is a clear path selected for flight extending upward and outward from the touchdown pad and safety circle. Preferably, the approach and departure paths should not be the same. Several approach and departure paths should be developed. This allows pilots to adjust to changes in wind conditions.</p> <p>The minimum width of approach and departure paths should be the same as the diameter of the corresponding safety circle.</p> <p>Safety may be improved if the paths could be widened 20 degrees from the safety circle.</p> <p>The paths may generally be aligned with the prevailing wind, but not always. Pilots will use such variables as velocity of the wind, turbulence, updrafts and downdrafts in deciding the direction of approach and departure.</p> <p>The approach and departure path should not overfly structures, inhabited areas, personnel, and vehicle parking areas.</p>	<p>Slide 8-17 Slide 8-18 Slide 8-19</p>

OUTLINE	AIDS & CUES
<p>Routes for sling operations should never fly over these areas.</p> <p>Curving paths are permissible in order to avoid major obstacles.</p> <p>No obstacles should penetrate that slope during the 20 degree spread for:</p> <ul style="list-style-type: none"> <li>• Approach Path – 150 feet (48 meters)</li> <li>• Departure Path –300 feet (95 meters)</li> </ul> <p>The minimum clearance for the approach and departure path should be equal to the safety circle diameter.</p>	
<p>D. Helispot Construction</p> <p>Hand construction methods are best since there is less ground disturbance than that created by mechanized construction.</p> <p>Be aware of construction restraints, follow local policy and get permission first from a resource advisor.</p> <p>Time to construct a helispot in timber will take time to establish. May want to take the extra time to find another location.</p>	<p>Slide 8-20</p>



OUTLINE	AIDS & CUES
<p>Excessive bucked up pieces are unnatural. They also increase the workload of camouflaging cut faces during helispot rehabilitation.</p> <ul style="list-style-type: none"> <li>• If large rocks are moved, they should be removed and placed in an area where they appear to be natural.</li> <li>• Dozer-constructed landing areas generally have soil that is too disturbed, requiring dust abatement procedures.</li> </ul>	<p>Slide 8-23</p>
<p>E. Helispot Hazards</p> <ul style="list-style-type: none"> <li>• Wires, towers, fences, snags</li> <li>• Construction incomplete, not level, or not cleared; ground cover not removed to a safe distance.</li> <li>• Canyon bottoms or converging canyons</li> <li>• Cirque basins</li> <li>• Roads</li> <li>• Tundra or boggy areas</li> <li>• Dusty, loose soil conditions</li> <li>• Crews congregating on the helispot.</li> <li>• Litter, paper and plastic bags, boxes, sleeping bags or other light items</li> </ul>	<p>Slide 8-24</p> <p>Slide 8-25</p> <p>Slide 8-26</p> <p>Slide 8-27</p> <p>Slide 8-28</p> <p>Slide 8-29</p> <p>Slide 8-30</p> <p>Slide 8-31</p>



OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Fiber tape</li> <li>• Flagging</li> <li>• Pocket calculator</li> <li>• Line gear</li> <li>• Food and drinking water</li> <li>• Passenger briefing cards</li> <li>• Radio</li> <li>• Incident action plan (IAP)</li> </ul>	<p>Slide 8-39</p>
<div style="border: 2px solid black; padding: 5px;"> <p><b>Mention that the IRPG Helicopter Landing Area Selection section can be used as a reference for what was just covered.</b></p> </div>	
<p>B. Personnel Assigned to a Helispot</p> <p>Helispot management assignments will normally be given out at the morning briefing at the helibase.</p> <ul style="list-style-type: none"> <li>• Ensure that daily missions to helispot are understood.</li> <li>• Flight helmets must be worn when flying to staff a helispot. When a helispot manager is on the helispot, it is then considered managed.</li> </ul>	<p>Slide 8-40</p>

OUTLINE	AIDS & CUES
<p>Passengers flying from a managed helispot or helibase to another managed helispot or helibase may wear a hard hat with a chin strap in lieu of a flight helmet.</p> <ul style="list-style-type: none"> <li>• The helispot should not be made operational until the helispot manager informs the helibase that they are ready to receive personnel and/or cargo.</li> </ul>	
<p>C. Helispot Management</p>	<p>Slide 8-41</p>
<p>Helispot management is essential for safe and efficient operations.</p> <ul style="list-style-type: none"> <li>• Obtain briefing from Helibase Manager.</li> <li>• Minimum of two persons assigned.</li> <li>• Should be familiar with all helicopters at helibase.</li> </ul>	
<ul style="list-style-type: none"> <li>• As the helispot operation becomes more complex, additional people may be needed to provide support.</li> <li>• Ensure that qualified helicopter crew members are assigned to assist in helispot management.</li> <li>• Provide on-the-job training as necessary.</li> <li>• Conduct regular briefings with helispot crew.</li> </ul>	<p>Slide 8-42</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Ensure all assigned personnel understand their responsibilities and authority.</li> <li>• Manage resources/supplies dispatched to the helispot.</li> <li>• Ensure that all helispot personnel are capable and prepared to perform fire suppression duties in and around the helispot.</li> <li>• Ensure that helispot crew is equipped to remain overnight, even in adverse weather conditions.</li> </ul>	Slide 8-43
<ul style="list-style-type: none"> <li>• Establish radio communications with the helibase.</li> <li>• Ensure the helispot and landing pad is constructed and prepared properly.</li> <li>• Install wind indicators and sign the area perimeter as necessary.</li> </ul>	Slide 8-44
<ul style="list-style-type: none"> <li>• Perform any necessary aerial and ground hazard reduction and safety improvements.</li> <li>• Anticipate dust abatement needs and provide or request as necessary.</li> <li>• Ensure crash-rescue equipment is available.</li> <li>• Ensure that flight routes and aerial hazards are made known to all pilots.</li> </ul>	Slide 8-45

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Ensure manifests and briefings are timely and accurate.</li> <li>• Return external load equipment (nets, leadlines, swivels) and excess firefighting equipment to the helibase promptly.</li> <li>• Inform Helibase Manager of helispot activities.</li> <li>• If returned to the helibase, attend the nightly debriefing and provide feedback on the day's operations; otherwise, provide by radio.</li> <li>• Helispot crews should be continuously cleaning the helispots of garbage and loose debris.</li> </ul>	<p>Slide 8-46</p>
<p>D. Apply Risk Management</p> <ul style="list-style-type: none"> <li>• Before any helispot staffing/development can occur, refer to the IRPG and apply the Risk Management Process.</li> <li>• Do not rely on helicopters to be your escape route to a safety zone.</li> <li>• Follow the process to determine if the helispot can be developed and function safely.</li> <li>• Anytime the situation changes, contact the helibase manager to inform of situation change.</li> </ul>	<p>Slide 8-47</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Wait for further instructions to cease or continue helispot operations.</li> </ul> <p><b>EXERCISE: Risk Management Applied</b></p> <p><u>Purpose:</u> For students to become familiar with the application of the risk management process.</p> <p><u>Format:</u> Students groups or classroom</p> <p><u>Time:</u> 15 minutes</p> <p><u>Materials:</u></p> <ul style="list-style-type: none"> <li>• IRPG</li> </ul> <p><u>Scenario:</u></p> <p>You are preparing to staff H-2 helispot on the South Fork fire. Identify each step of the risk management process and how it applies to your helispot management with an active ongoing fire.</p> <p><u>Instructions:</u></p> <ol style="list-style-type: none"> <li>1. Apply the risk management process from your IRPG for this scenario.</li> <li>2. For each step of the risk management process, identify, the what's, and the how's of accomplishing the step.</li> <li>3. The instructor will go through each step of the process prompting you for your answer(s)</li> <li>4. When finished, discuss and review answers in class.</li> </ol>	<p>Slide 8-48</p>

OUTLINE	AIDS & CUES
<p>Step 1: How are you going to gather information?</p> <p><b>Probable answers: IAP, local knowledge, briefings, etc.</b></p>	
<p>Step 2: Hazard Assessment</p> <p><b>Probable answers: Fire hazards, aerial hazards, helispot hazard, weather concerns, insects, animals, etc.</b></p>	
<p>Step 3: Hazard Control</p> <p><b>Probable answers: LCES, communications, qualified personnel, equipment, etc.</b></p>	
<p>Step 4: Decision point</p> <p><b>Probable answers: Controls for hazards, expected fire behavior, clear instructions, etc.</b></p>	
<p>Step 5: Evaluate</p> <p><b>Probable answers: Human factors, changing situations, etc.</b></p>	
<p><b><u>End of Exercise.</u></b></p>	
<p><b>Review Unit Objectives.</b></p> <p><b>Hand out unit quiz. Correct quiz as a class.</b></p>	<p>Slide 8-49</p> <p>HO-8-1</p>



## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 9 – Demobilization

**Time** 30 Minutes

### Objective

Describe the demobilization process for the HECM.

### Strategy

This unit will help students to follow the proper demobilization process for the HECM. This will be accomplished through lecture and discussion.

### Instructional Method

- Facilitation/informal lecture with PowerPoint

### Instructional Aids

- Computer with LCD projector and presentation software
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)

### Exercise

- None

### Evaluation Method

- Unit 9 Quiz – HO-9-1

### Outline

The Demobilization Process

### 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: Helicopter Crewmember, S-271

UNIT: 9 – Demobilization

OUTLINE	AIDS & CUES
<b>Unit Title Slide.</b>	Slide 9-1
<b>Present Unit Objective.</b>	Slide 9-2
<b>DEMOBILIZATION PROCESS</b>	Slide 9-3
<p>Preparation for demobilization begins with mobilization. Each individual (single resource) or Chief of Party (exclusive use) mobilized to an incident has responsibilities in the demobilization process.</p>	
<p>If you are a member of an exclusive use helicopter the helicopter manager will usually take care of the demobilization for the crew.</p>	
<p>If you are a single resource on a CWN helicopter you will need to go through the demobilization process before getting released from an incident.</p>	
<p>The following checklist identifies some of the key responsibilities:</p>	Slide 9-4
<ul style="list-style-type: none"><li>• Verify demobilization schedule with supervisor.</li><li>• Ensure that your sleeping area is clean and free of debris and trash.</li></ul>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Clean and ready gear for another assignment and travel.</li> <li>• File required forms and report to the documentation unit.</li> <li>• Make sure travel time to your final destination is posted on your Emergency Firefighter Time Report, OF-288.</li> <li>• Verify that your time on your timesheet is correct before signing. By signing you are stating that your time is correct.</li> <li>• Submit timesheet to the Finance/Administration Section. Be sure to get your copy to give to your home unit for processing.</li> <li>• Return incident issued communications equipment to the communications unit.</li> <li>• Return incident issued work materials to the supply unit.</li> <li>• Follow check-out procedures, you may be asked to use Demobilization Checkout Form, ICS-221.</li> </ul>	<p>Slide 9-5 Slide 9-6</p> <p>Slide 9-7</p> <p>Slide 9-8</p>

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Ensure you receive a performance evaluation from your incident supervisor. Keep a copy for your records.</li> </ul>	Slide 9-9
<p>For a HECM this may be a:</p> <ul style="list-style-type: none"> <li>– Helitack Crew Performance HBM-12</li> <li>– Helibase Personnel Performance Rating HBM-13</li> <li>– Individual Performance Rating ICS-226</li> </ul>	Slide 9-10
<ul style="list-style-type: none"> <li>• Closeout with the Incident Training Specialist TNSP if you worked on a task book.</li> <li>• Report to departure points ahead of schedule.</li> <li>• Stay with your group until you arrive at your final destination.</li> <li>• Get feedback on overhead performance suggestions for improvement.</li> </ul>	Slide 9-11
<p>Once you have completed the demobilization process double check to make sure you haven't left any of the ICS-221 form incomplete.</p>	Slide 9-12

OUTLINE	AIDS & CUES
<p><b>Don't leave without copies of your firefighter time report and your performance evaluation.</b></p> <div style="border: 2px solid black; padding: 5px;"><p><b>Any questions?</b></p><p><b>Review Objective.</b></p><p><b>Hand out unit quiz. Correct quiz as a class.</b></p></div>	<p>Slide 9-13</p> <p>HO-9-1</p>

## UNIT OVERVIEW

**Course** Helicopter Crewmember, S-271

**Unit** 10 – Field Exercise

**Time** 6 – 8 Hours

### Objectives

1. Prepare a cargo load.
2. Use proper procedures for passenger transport, loading /unloading internal and external loads.
3. Marshall the helicopter using hand signals.
4. Demonstrate compass and stick/pencil method to assess tree heights.

### Strategy

This field exercise will help students to perform the duties of the HECM through hands-on application of the concepts taught in the previous units. This field exercise is not optional and each student will be assessed on their performance of the series of tasks practiced in the field exercise.

### Instructional Methods

- Facilitate and Demonstrate operation procedures
- Additional qualified instructors to serve as coaches

### Instructional Aids

- Helicopter/Pilot carded to perform the specific exercise
- Outdoor location (large enough to accommodate exercise stations).
- Incident Response Pocket Guide (IRPG)
- Interagency Helicopter Operations Guide (IHOG)

In the event a helicopter is not available, the classroom can be utilized. Arrange chairs to resemble the seating of a helicopter. For loading and unloading passengers.

## **Exercise**

- Helicopter hands-on stations

## **Evaluation Methods**

- Observation
- Student Field Exercise Evaluation Performance
- After Action Review (AAR)

## **Outline**

- I. Field Exercise Briefing
- II. Exercise Stations

## **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: Helicopter Crewmember, S-271

UNIT: 10 - Field Exercise

OUTLINE	AIDS & CUES
<div data-bbox="207 583 1052 722" style="border: 2px solid black; padding: 5px;"><p><b>Present Unit Objectives.</b></p><p><b>Introduce coaches and their exercise station.</b></p></div> <p>I. FIELD EXERCISE BRIEFING</p> <p>The purpose of this field exercise day is to provide the students with actual hands-on experience, helicopter operations and to safely conduct helicopter functions they will be required to perform in the field. Students should complete this day with complete confidence in their performance of the duties of a helicopter crewmember.</p> <p>Coaches will be assigned to each station to assist and oversee the student performance. Coaches will evaluate student's performance by initialing the field exercise evaluation indicating that the function has been performed successfully.</p> <p>Students will need to successfully complete all items listed on the field exercise evaluation a minimum of two times (twice) to complete the course.</p>	HO-10-1

## II. EXERCISE STATIONS

**Divide students into equal groups and rotate groups through each of the exercise stations.**

**Initial the student's field exercise evaluation indicating the student successfully completed the exercise.**

**Record additional remarks and/or recommendations on the student's field exercise evaluation.**

**Exercise station 3 and 4 could be conducted simultaneously to accomplish both exercises if desired.**

**Discuss emergency procedures with pilot and students. Ensure everyone involved knows and understands what is expected of them.**

OUTLINE	AIDS & CUES
<p><b>Exercise Station 1 – Cargo Load</b></p> <p><u>Purpose:</u> To have students prepare a cargo load for sling operations. Students should leave this station with the ability to identify hazardous materials and the knowledge to properly prepare a cargo load by following procedures.</p> <p><u>Time:</u> TBD</p> <p><u>Format:</u> Students work in small groups of 3 to 5</p> <p><u>Materials Needed:</u></p> <ul style="list-style-type: none"> <li>• Fiber tape, duct tape, electrical tape, and packaging materials, and card board boxes.</li> <li>• Cargo hook, cargo nets, lead lines, and swivels</li> <li>• Longline with remote hook</li> <li>• Scales</li> </ul> <p><u>Instructions:</u></p> <ol style="list-style-type: none"> <li>1. Interject as needed to assist group as they prepare a cargo load. Ensure students perform the following: <ul style="list-style-type: none"> <li>• Wear appropriate PPE</li> <li>• Inspection</li> <li>• Identify hazardous materials (notify pilot of any hazardous materials)</li> <li>• Packaging, weighing, securing and rigging</li> </ul> </li> </ol>	

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"> <li>• Liquid containers in upright position</li> <li>• Manifesting</li> <li>• Obtain pilot approval</li> <li>• Load and unload cargo</li> </ul> <p>Each student should build a minimum of three loads. This should be done in groups of two students per load. Loads that are constructed should be different, example:</p> <ul style="list-style-type: none"> <li>• One standard cargo net load</li> <li>• One light-weight cargo net load</li> <li>• Slingable tank, fold-a-tank, or plywood/lumber load.</li> </ul> <div style="border: 2px solid black; padding: 5px; margin: 10px 0;"> <p><b>Initial the student’s field exercise evaluation indicating the student successfully completed the exercise.</b></p> <p><b>Record additional remarks and/or recommendations on the student’s field exercise evaluation.</b></p> </div> <ol style="list-style-type: none"> <li>2. When finished, gather group for a short AAR.</li> <li>3. Answer any questions or concerns.</li> <li>4. Have group move on to the next exercise station.</li> </ol> <p><b><u>End of Exercise.</u></b></p>	

**Exercise Station 2 – Passenger Transport**

Purpose: To have students prepare passengers for helicopter transport operations. Students should leave this station with the ability to comfortably and accurately prepare passengers for helicopter transport by following established procedures.

Time: TBD

Format: Students work in small groups of 3 to 5

Materials Needed:

- Passengers (divide students up to be passengers)
- Manifest forms for each student.
- IRPG (Helicopter Passenger Briefing)

Instructions:

1. Instructors walk students through the process of manifesting, securing equipment, loading and unloading. Reinforce the importance of ensuring the overall safety of passengers.

Have students take turns individually for this exercise. Students who turn is not up will serve as passengers being prepared for passenger transport. Instructor interjects as needed to assist student. Ensure students perform the following:

- Wear appropriate PPE
- Manifest each passenger
- Passenger Safety Briefing (as a group)

OUTLINE	AIDS & CUES
<ul style="list-style-type: none"><li>• Loading Procedures after Safety Briefing.</li><li>• In-Flight Precautions</li><li>• Unloading Procedures</li><li>• Use the IRPG to assist them</li></ul> <ol style="list-style-type: none"><li>2. When finished, gather group for a short AAR.</li><li>3. Answer any questions or concerns.</li><li>4. Have group move on to the next exercise station.</li></ol>	
<p><b><u>End of Exercise</u></b></p>	

OUTLINE	AIDS & CUES
<p><b>Exercise Station 3 – Bucket Exercise</b></p> <p><u>Purpose:</u> To have students become familiar with bucket deployment, bucket checks, and bucket storage.</p> <p><u>Time:</u> TBD</p> <p><u>Format:</u> Students work in small groups of 3 to 5</p> <p><u>Materials Needed:</u></p> <ul style="list-style-type: none"> <li>• Collapsible bucket</li> <li>• Bucket carrying bag</li> </ul> <p><u>Instructions:</u></p> <ol style="list-style-type: none"> <li>1. Instructor will demonstrate methods before having students attempt this exercise. <p>Have students take turns individually for this exercise. Give the student instructions on what obstacles you would like them to assess.</p> <p>Interject as needed to assist student. Ensure students perform the following:</p> <ul style="list-style-type: none"> <li>• Wear appropriate PPE</li> <li>• Deploying bucket</li> <li>• Bucket checks</li> <li>• Bucket troubleshooting</li> <li>• Re-packaging bucket for internal transport</li> </ul> </li> <li>2. When finished, gather group for a short AAR.</li> </ol>	

OUTLINE	AIDS & CUES
<p>3. Answer any questions or concerns.</p> <p>4. Have group move on to the next exercise station.</p> <p><b><u>End of Exercise</u></b></p> <p><b>Exercise Station 4 – Tree Height Assessment</b></p> <p><u>Purpose:</u> To have students become familiar with utilizing stick and compass methods for determining tree heights and length of long-line in order to ensure safety. Students should leave this station with the ability to assess tree heights using both procedures.</p> <p><u>Time:</u> TBD</p> <p><u>Format:</u> Students work in small groups of 3 to 5</p> <p><u>Materials Needed:</u></p> <ul style="list-style-type: none"> <li>• Sticks or pencils</li> <li>• Compasses</li> <li>• Standing trees</li> <li>• Obstacles</li> </ul> <p><u>Instructions:</u></p> <p>1. Instructor will demonstrate methods before having students attempt this exercise.</p> <p>Have students take turns individually for this exercise. Give the student instructions on what obstacles you would like them to assess.</p>	

OUTLINE	AIDS & CUES
<p data-bbox="298 283 954 363">Interject as needed to assist student. Ensure students perform the following:</p> <ul data-bbox="298 411 837 789" style="list-style-type: none"><li data-bbox="298 411 727 449">• Wear appropriate PPE</li><li data-bbox="298 495 727 533">• Pencil or stick method</li><li data-bbox="298 579 651 617">• Compass method</li><li data-bbox="298 663 837 701">• Determine length of long-line</li><li data-bbox="298 747 753 785">• Are reasonably accurate</li></ul> <div data-bbox="207 842 1052 940" style="border: 2px solid black; padding: 5px;"><p data-bbox="220 848 997 926"><b>Instructor will need to pre-determine tree height prior to exercise.</b></p></div> <ol data-bbox="201 989 1024 1192" style="list-style-type: none"><li data-bbox="201 989 980 1026">2. When finished, gather group for a short AAR.</li><li data-bbox="201 1073 818 1110">3. Answer any questions or concerns.</li><li data-bbox="201 1157 1024 1192">4. Have group move on to the next exercise station.</li></ol> <p data-bbox="201 1245 456 1283"><b><u>End of Exercise</u></b></p>	

**Exercise Station 5 – Marshalling and Radio Communication**

**This exercise is to be completed during live helicopter hover hook-up and longline training.**

**This exercise is in conjunction with Station 6 Cargo hook-up**

Purpose: To have students guide the pilot flying the helicopter with the use of established helicopter hand signals and radio communication for arrival and departure to and from landing spot, and for hover hook-ups for long line operations. Students should leave this station with the ability to comfortably and accurately guide and command a helicopter by following established procedures.

Time: TBD

Format: Students work in small groups of 3 to 5

Materials Needed:

- Helicopter and pilot
- PPE
- Radio with helicopter frequency
- IRPG (Helicopter Hand Signals)

Instructions:

1. Pilot will need to be briefed on the intention of this exercise and informed to follow the hand signal given by the student.

OUTLINE	AIDS & CUES
<p>The instructor will need to demonstrate marshalling procedures first before having students attempt the exercise.</p> <p>Have students take turns individually for this exercise. Give the student instructions on what you would like for them to have the helicopter do. Maneuver the helicopter so that most of the hand signals are used.</p> <p>Instructor interjects as needed to assist student. Ensure students perform the following:</p> <ul style="list-style-type: none"> <li>• Wear appropriate PPE</li> <li>• Ensure and maintain eye contact with pilot</li> <li>• Check for obstacles and obstructions before signaling pilot to take off and land</li> <li>• Use approved hand signals</li> <li>• Radio contact has been established</li> <li>• Would have provided for fire protection if needed.</li> <li>• Use the IRPG to assist them</li> </ul> <p>2. When finished, gather group for a short AAR.</p> <p>3. Answer any questions or concerns.</p> <p>4. Have group move on to the next exercise station.</p> <p><b><u>End of Exercise</u></b></p>	

**Exercise Station 6 – Cargo Hook-up (Long-line and Hover Hook-up)**

**This exercise is in conjunction with Station 5  
Marshalling and communication**

Purpose: To have students become familiar with the operation of cargo hook and/or remote hook. By following ground hook-up procedures, hover hook-up procedure and long-line remote hook procedures. Students should leave this station with the ability to comfortably and accurately hook cargo to the helicopter by following established procedures.

Time: TBD

Format: Students work in small groups of 3 to 5

Materials Needed:

- Helicopter and pilot
- PPE
- Remote electric hook with protective cage
- One section of long line
- Swivel
- Lead line

Instructions:

1. Instructor must demonstrate one complete cycle first before having students attempt this exercise.

OUTLINE	AIDS & CUES
<p>Have students take turns individually for this exercise. Give the student instructions on what hook up procedure you would like for them to do.</p> <p>Interject as needed to assist student. Ensure students perform the following:</p> <ul style="list-style-type: none"><li>• Wear appropriate PPE</li><li>• Inspect swivel</li><li>• Inspect hook</li><li>• Inspect line</li></ul> <ol style="list-style-type: none"><li>2. When finished, gather group for a short AAR.</li><li>3. Answer any questions or concerns.</li><li>4. Have group move on to the next exercise station.</li></ol> <p><b><u>End of Exercise.</u></b></p>	

