E/L 0987

NIMS ICS All-Hazards Introduction to Air Operations Course

FEMA

Student Manual

January 2020
Version 1.0

As a result of flooding caused by hurricane Katrina, Air Force personnel assist a group of ambulatory evacuees onto the medevac plane, as New Orleans is being evacuated that will take them to a hospital in Shreveport, La.

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Table of Contents

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Unit 1: Course Introduction

STUDENT MANUAL

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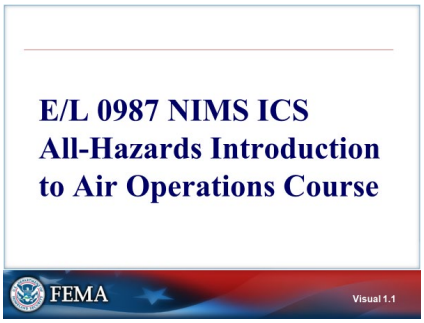
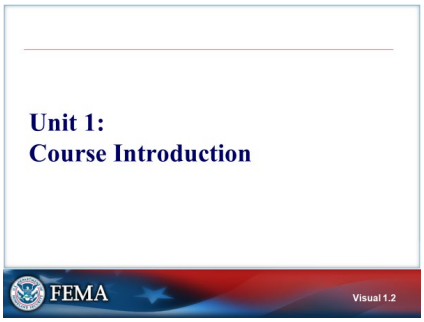


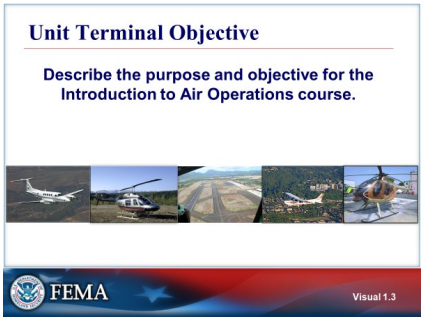
Visual 1.1

E/L 0987 NIMS ICS ALL-HAZARDS INTRODUCTION TO AIR OPERATIONS COURSE



Visual 1.2

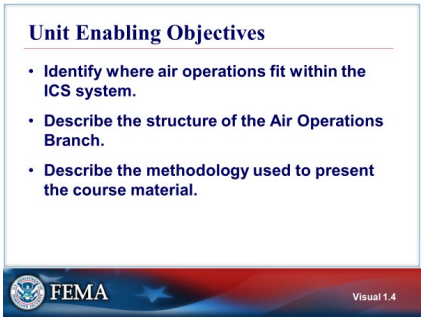
UNIT 1: COURSE INTRODUCTION



Visual 1.3

UNIT TERMINAL OBJECTIVE

Describe the purpose and objective for the Introduction to Air Operations course.

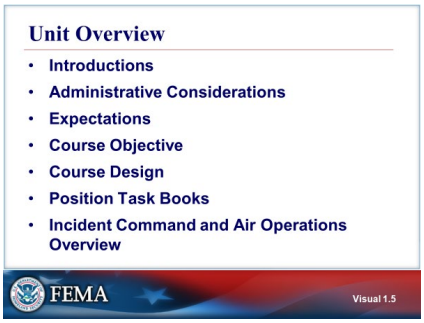


Visual 1.4

UNIT ENABLING OBJECTIVES

- Identify where air operations fit within the ICS system.
- Describe the structure of the Air Operations Branch.
- Describe the methodology used to present the course material.

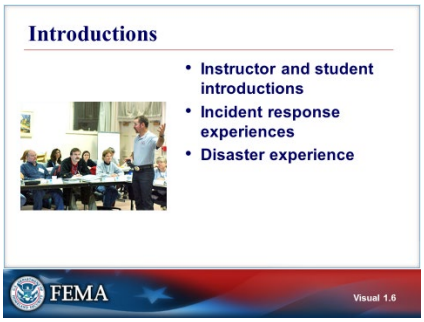
The Final Exam, to be discussed later in this unit, will be composed of questions based on the Unit Enabling Objectives from each unit. However, students will not be tested on content from Unit 1.



Visual 1.5

UNIT OVERVIEW

This visual provides a general overview of the topics to be covered in the unit.



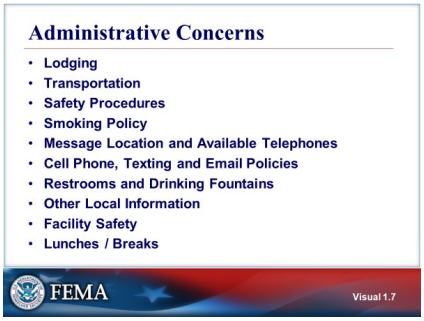
Visual 1.6

INTRODUCTIONS

The instructor gives an overview of their personal experience in air operations and the agencies in which they have worked.

You will be asked to introduce yourself and provide an overview of your incident response experiences and ICS background as well as your reasons for wanting to be in air operations.

After the introductions, the instructor will administer the Pretest.



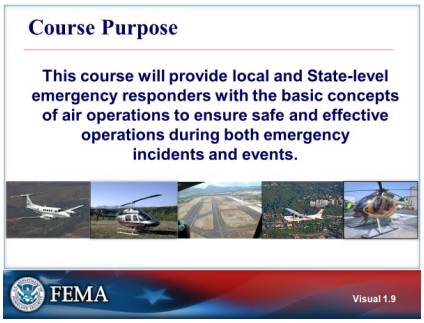
Visual 1.7

ADMINISTRATIVE CONCERNS

Visual 1.8

EXPECTATIONS

Share your expectations for the course.

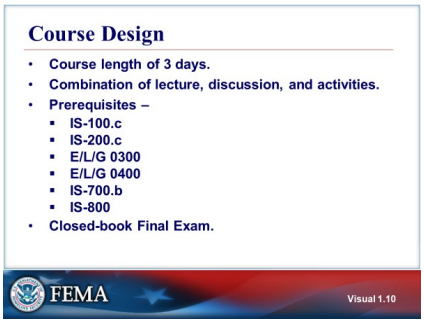


Visual 1.9

COURSE PURPOSE

This course was designed primarily for the person with little or no aviation knowledge. It will provide you with an overview of air operations including terminology and critical concepts necessary for you to interact safely with air operations and personnel.

This course does not qualify you to perform any operational positions associated with air operations. Conducting air operations requires additional training and extensive experience typically obtained through your home agency or State.



Visual 1.10

COURSE DESIGN

The course is scheduled to be 3 days in length.

Through a combination of lecture, discussion, and activites, students, upon course completion, will be provided the knowledge to meet the objectives of the course. Student interaction and participation will be integral to this process.

The course materials were developed as a position-specific course focusing on the duties and responsibilities of one member of IMT (in this course, air operations) in an all-hazards context.

Prerequisites -

- IS0100 An Introduction to the Incident Command System, ICS 100
- IS-0200 Basic Incident Command System for Initial Response, ICS 200
- E/L/G 0300 Intermediate Incident Command System for Expanding Incidents, ICS 300
- E/L/G 0400 Advanced Incident Command System for Complex Incidents, ICS 400
- IS-0700 An Introduction to the National Incident Management System
- IS-0800 National Response Framework (NRF), An Introduction

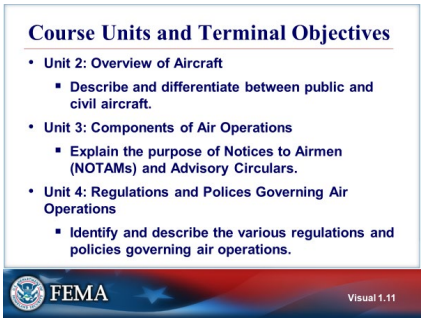
Recommended courses:

- E/L/G 0191 Emergency Operations Center/Incident Command System Interface
- O 305 Type 3 AHIMT Training Course (US Fire Administration)
- O 337 Command & General Staff Functions for Local Incident Management Team (National Fire Academy)

Closed-Book Final Exam - To receive a certificate of completion for the course, students must obtain a 75% or higher on the Final Exam. The Final Exam will be closed-book, one hour will be allotted for its completion, and the

Final Exam's questions will be based on the Unit Enabling Objectives for Units 2 - 8. Unit 1 will not be tested in the Pretest nor the Final Exam.

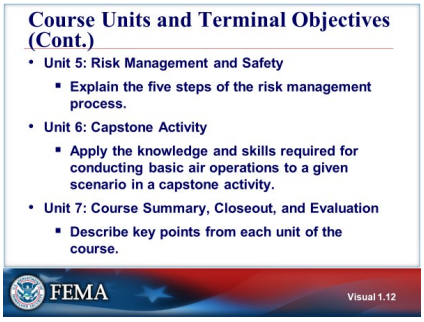
If students are able to meet the Unit Enabling Objectives for each unit in the course, they should be able to pass the Final Exam. As it is a closed-book Final Exam, students should be encouraged to study the course materials during their time away from training.



Visual 1.11

COURSE UNITS AND TERMINAL OBJECTIVES

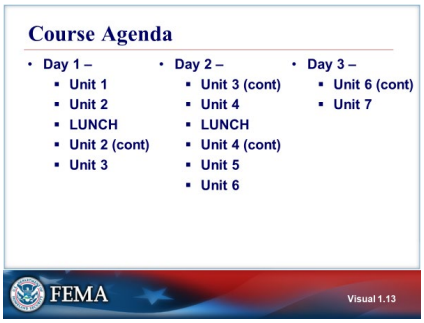
- Unit 2: Overview of Aircraft
  - Describe and differentiate between public and civil aircraft.
- Unit 3: Components of Air Operations
  - Explain the purpose of Notices to Airmen (NOTAMs) and Advisory Circulars.
- Unit 4: Regulations and Polices Governing Air Operations
  - Identify and describe the various regulations and policies governing air operations.



Visual 1.12

COURSE UNITS AND TERMINAL OBJECTIVES (CONT.)

- Unit 5: Risk Management and Safety
  - Explain the five steps of the risk management process.
- Unit 6: Capstone Activity
  - Apply the knowledge and skills required for conducting basic air operations to a given scenario in a capstone activity.
- Unit 7: Course Summary, Closeout, and Evaluation
  - Describe key points from each unit of the course.



Visual 1.13

COURSE AGENDA

Day 1 –

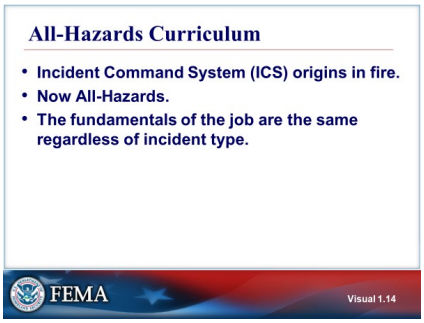
- Unit 1
- Unit 2
- LUNCH
- Unit 2 (cont)
- Unit 3

Day 2 –

- Unit 3 (cont)
- Unit 4
- LUNCH
- Unit 4 (cont)
- Unit 5
- Unit 6

Day 3 –

- Unit 6 (cont)
- Unit 7



Visual 1.14

ALL-HAZARDS CURRICULUM

NIMS ICS All-Hazards Position Specific training was born out of the terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001, and was reinforced by the natural disasters of Hurricanes Katrina and Rita in 2005.

These incidents underscored the need for the nation's emergency managers and first responders to develop an improved posture for protection, prevention, mitigation, response, and recovery through an "all hazards" strategy. At the core of this realization is the need for standardized training in systems and performance competencies that enable emergency management and response resources to execute the essential tasks needed to overcome any challenge.

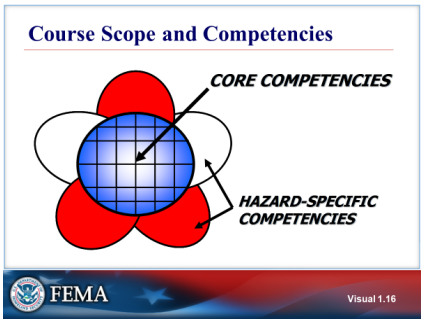
This curriculum was validated by a diverse cadre of course developers with air operations backgrounds.

Given our personal incident experiences, each of us - instructors included – have a limited perspective (by no means All-Hazards).

Air operations personnel needs to fundamentally possess the same core knowledge, skills, and abilities whether they are responding to a fire, an oil spill, a mass-casualty incident, or other incident. In other words, regardless of the hazard, discipline, or incident, the essential job of air operations is the same. Therefore, students should not be deterred if one "hazard" from the list is spoken to more than another. Students can still obtain critical insight to the position and should add examples from their own disciplines to the discourse

Visual 1.15

DISCUSSION ACTIVITY



Visual 1.16

COURSE SCOPE/COMPETENCIES

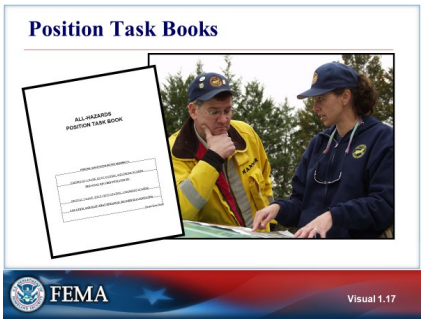
Competency is a broad description that groups core behaviors necessary to perform a specific function.

The Flower Diagram illustrates the concept that successful performance of the tasks, duties, activities in any position requires both core and incident-specific competencies.

Key Points:

- Core competencies are the competencies required of air operations regardless of discipline.
- Hazard-specific competencies are those required to perform in a particular discipline, such as law enforcement, fire, public health, HAZMAT, EMS, public works, etc.
- The center of the flower represents the core competencies of the position.
- The petals represent the hazard-specific competencies associated with specific disciplines.
- You cannot be competent within air operations with only the center of the flower or only the petals—"The flower needs to be complete" to ensure qualification.

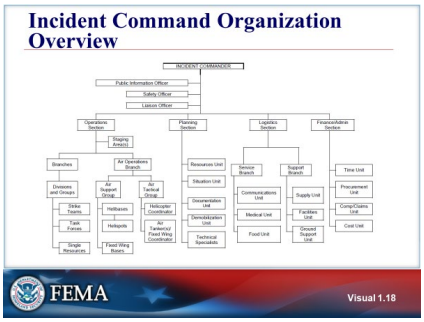
This course will help to establish core competencies (center of the flower) for air operations. The hazard-specific competencies will have to be developed through additional agency or discipline training, field training, and the completion of the Air Operations Position Task Book, discussed on the next visual.



Visual 1.17

POSITION TASK BOOKS

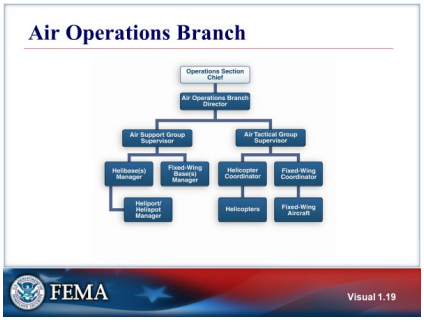
PTBs are the primary tools for observing and evaluating the performance of trainees aspiring to a new position within ICS. PTBs allow documentation of a trainee's ability to perform each task, as prescribed by the position. Successful completion of all tasks is the basis for recommending certification.



Visual 1.18

INCIDENT COMMAND ORGANIZATION OVERVIEW

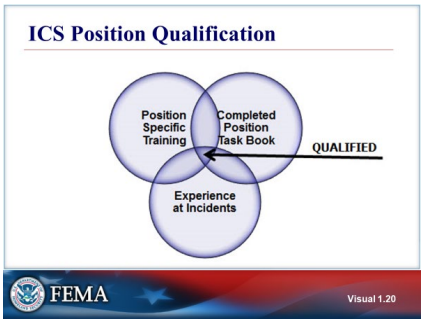
Refer to Handout 1-1: ICS Organizational Chart.



Visual 1.19

AIR OPERATIONS BRANCH

Refer to Handout 1-2: Air Operations Branch Organizational Chart.



Visual 1.20

ICS POSITION QUALIFICATION

ICS is a system and hinges on personnel performing the duties of the various positions competently. To perform the duties of a specific position you must be qualified in that position. Position qualification has three components:

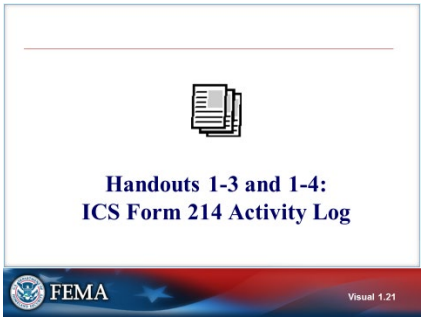
- Position specific training
- Completion of the Position Task Book
- Experience on incidents

Position Task Books can only be issued and certified at completion by authorized certifying personnel in the jurisdiction having authority (or by those the jurisdiction having authority and delegated); certification validates that you are qualified for that position. States do have the authority to delegate to other jurisdictions.

If you are not qualified by the above standards, you should NOT be performing ASGS or any other air operations position duties unsupervised. It you perform any of those duties when you are not qualified, you are endangering the lives of others and possibly yourself. You may perform in the ASGS position if you are being supervised by a qualified individual.

Three components of “qualified”:

- Position specific training (such as the ASGS course)
- Successfully completing the Position Task Book (that will be discussed at the end of this unit)
- Experience on incidents

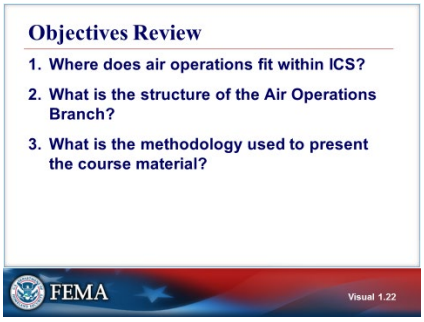


Visual 1.21

HANDOUTS 1-3 AND 1-4

The ICS Form 214 should document important factors, decisions, and elements such as the "three A's" – Actions, Agreements, and Accidents:

- **Actions** taken to prevent hazardous activities.
- **Agreements** made with Supervisors or others to correct unsafe conditions.
- **Accidents** that occurred at the incident site.



Visual 1.22

OBJECTIVES REVIEW

Unit Enabling Objectives

- Identify where air operations fits within the ICS system.
- Describe the structure of the Air Operations Branch.
- Describe the methodology used to present the course material.

Supplemental Materials

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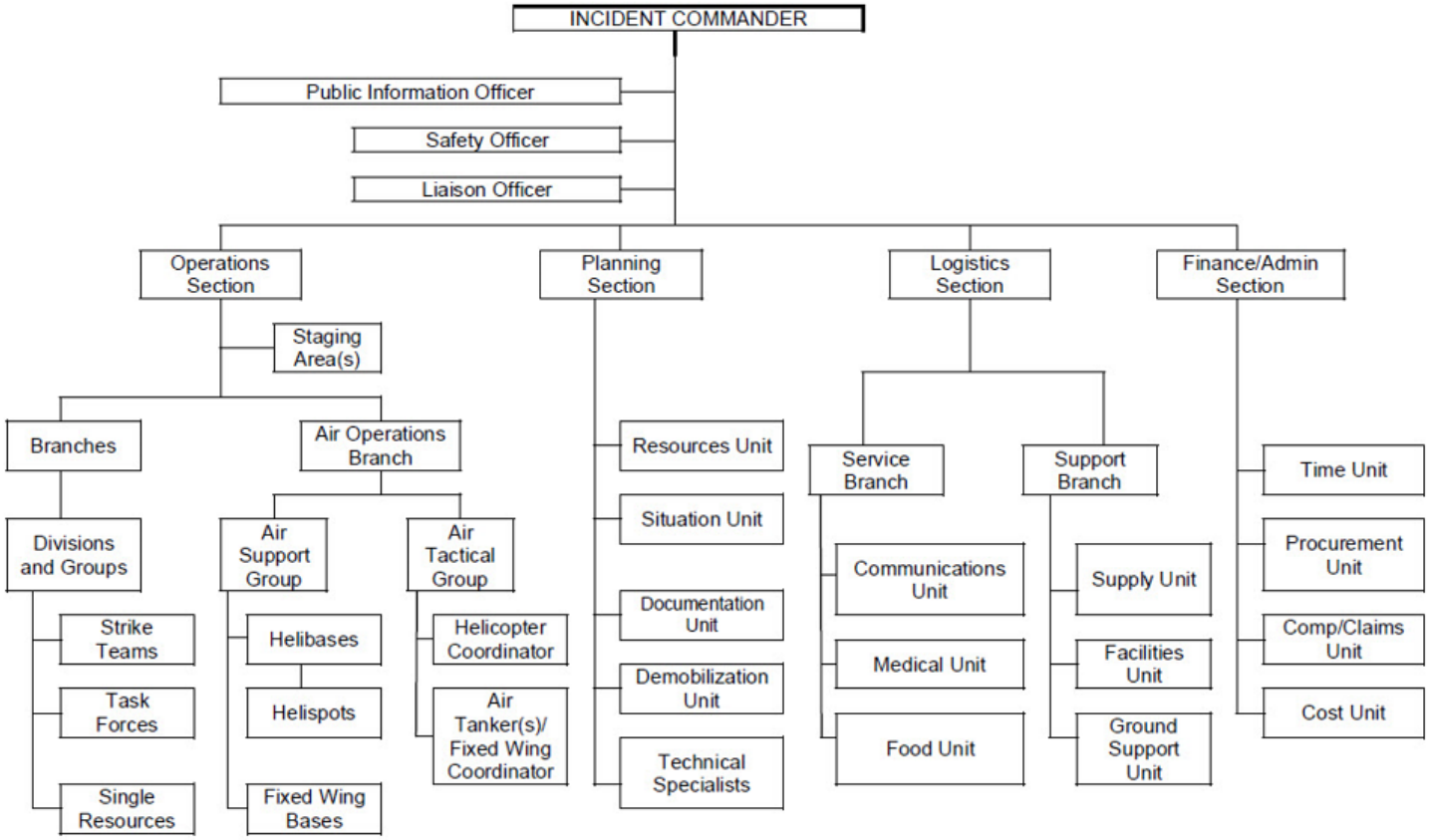
Handout 1-1: ICS Organizational Chart



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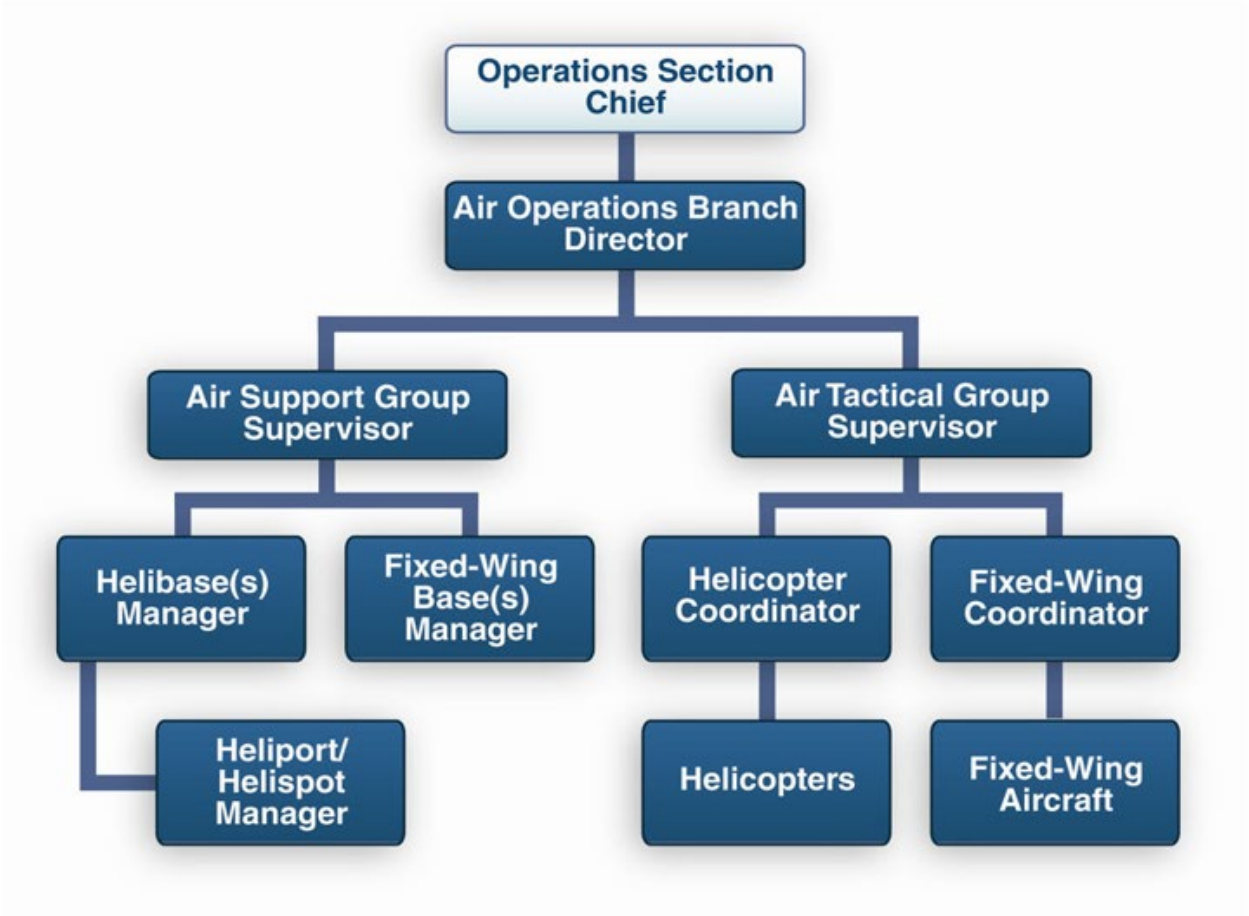
Handout 1-2: Air Operations Branch Organizational Chart



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Handout 1-3: Blank ICS Form 214 Activity Log

Refer to EL_987_HO_1-3_ICS_Form_214.pdf

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Handout 1-4: Sample Completed ICS Form 214 Activity Log

Refer to EL_987_HO_1-4_ICS_Form_214.pdf

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Unit 2: Overview of Aircraft

STUDENT MANUAL

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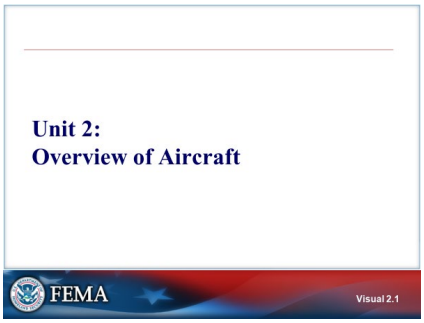
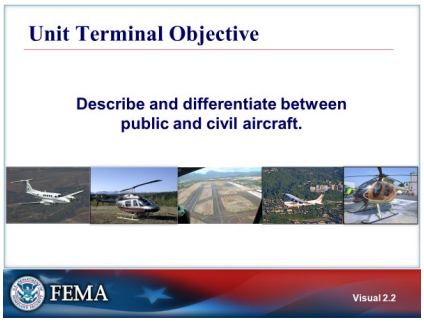


Visual 2.1

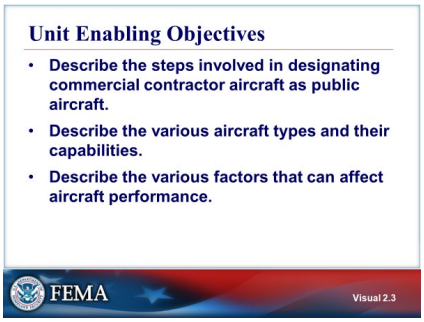
UNIT 2: OVERVIEW OF AIRCRAFT



Visual 2.2

UNIT TERMINAL OBJECTIVE

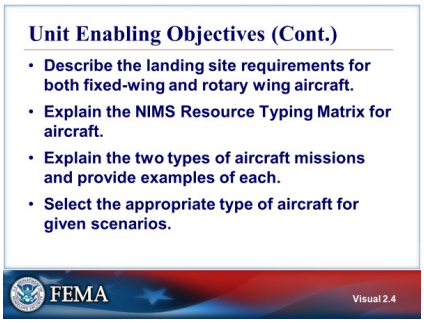
Describe and differentiate between public and civil aircraft.



Visual 2.3

UNIT ENABLING OBJECTIVES

- Describe the steps involved in designating commercial contractor aircraft as public aircraft.
- Describe the various aircraft types and their capabilities.
- Describe the various factors that can affect aircraft performance.



Visual 2.4

UNIT ENABLING OBJECTIVES (CONT.)

- Describe the landing site requirements for both fixed-wing and rotary wing aircraft.
- Explain the National Incident Management System (NIMS) Resource Typing Matrix for aircraft.
- Explain the two types of aircraft missions and provide examples of each.
- Select the appropriate type of aircraft for given scenarios.

The Final Exam questions are based on the Unit Enabling Objectives.

Visual 2.5

AIRCRAFT DEFINED

Public aircraft are all aircraft owned, operated and/or used only by the U.S. Government (this includes contracted aircraft), or any other governmental agency (e.g. State, local, tribal).

Visual 2.6

CIVIL AIRCRAFT OPERATIONS

The use of civil aircraft (civil aviation) includes two major categories:

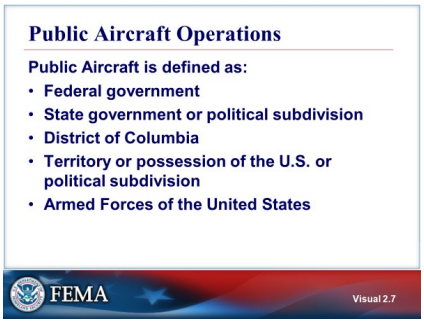
- **Scheduled air transport** which includes all passenger and cargo flights operating on regularly scheduled routes.
- **General aviation** which includes all other civil flights, private or commercial.

There is also a regulatory distinction based on whether aircraft are flown for hire:

- **Commercial purposes** which includes all flying done for hire, particularly scheduled service on airlines. Commercial purposes does not include the operation of an aircraft by one government on behalf of another government under a cost reimbursement agreement.
- **Private aviation** which includes pilots flying for their own purposes (e.g. recreation, business meetings) without receiving any kind of remuneration.

All scheduled air transport is commercial, but general aviation can be either commercial or private. The pilot, aircraft, and operator must all be authorized to perform commercial operations through separate commercial licensing, registration, and operation certificates.

The FAA also certifies some aircraft as “restricted” for civilian use. This category of aircraft is restricted to flying cargo only because they do not meet standard category airworthiness criteria. The aircraft may have been manufactured for the restricted category, type-certified in another category and altered for a special purpose operation, or may be surplus military aircraft altered for a special purpose. Civil aircraft rules are defined in Title 14 Code of Federal Regulations (14 CFR).



Visual 2.7

PUBLIC AIRCRAFT OPERATIONS

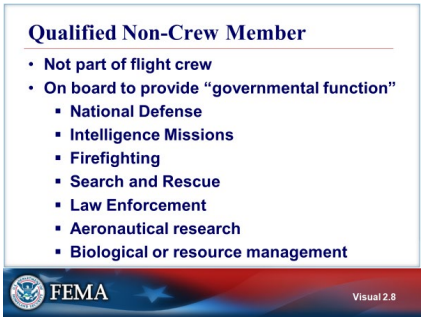
Public aircraft are defined in statute 49 USC § 40102 (a)(41)(A)-(D) and include any of the following:

(A) An aircraft used only for the United States Government.

(B) An aircraft owned by the Government and operated by any person for purposes related to crew training, equipment development or demonstration

(C) An aircraft owned and operated by the government of a State, the District of Columbia, or a territory or possession of the United States.

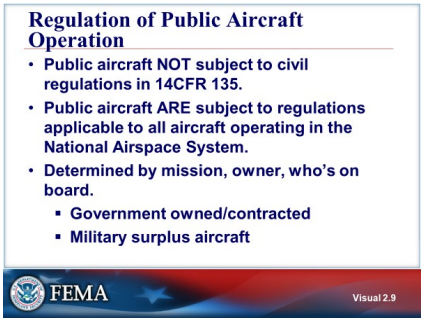
(D) An aircraft exclusively leased for at least 90 continuous days by the government of a State, the District of Columbia, or a territory or possession of the United States or any of the above aircraft are NOT flying as a public aircraft if they are used for commercial purposes or to carry an individual other than a crewmember or a qualified non-crewmember. The military are also subject to a similar limitation.



Visual 2.8

QUALIFIED NON-CREW MEMBER

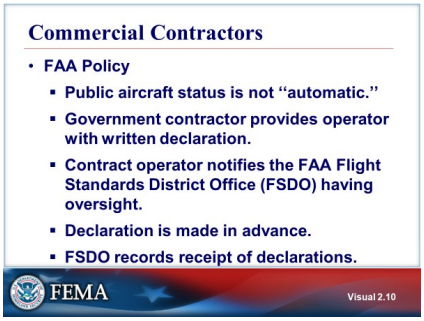
The definition of a qualified non-crew member: One who is not part of the flight crew but is on board to provide a "governmental function."



Visual 2.9

REGULATION OF PUBLIC AIRCRAFT OPERATION

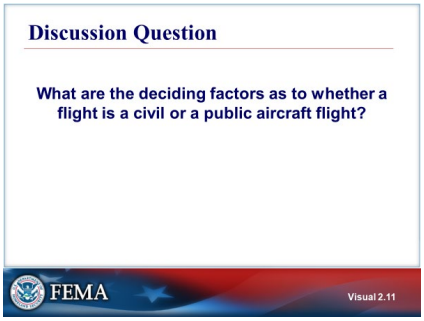
Public Aircraft Operations (PAO) are defined by statute. The Federal Aviation Administration (FAA) interprets the statute as part of Title 49, but cannot change it, grant permission to operate, or have the authority to adopt regulations for Public Aircraft Operations. The FAA also does not give advisory opinions on Public Aircraft Operations.



Visual 2.10

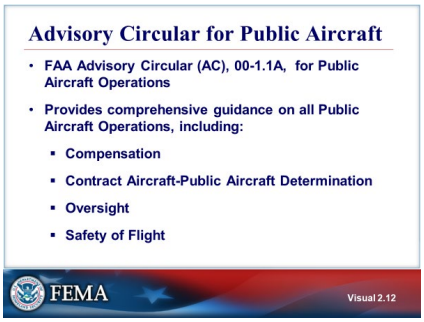
COMMERCIAL CONTRACTORS

It is important to understand that when a commercial contractor is flying as a public aircraft, the liability to the contracting governmental entity is increased significantly and that FAA oversight is limited.



Visual 2.11

DISCUSSION QUESTION



Visual 2.12

ADVISORY CIRCULAR FOR PUBLIC AIRCRAFT

Access the AC 00-1.1A from this website: https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_00-1_1A.pdf

Visual 2.13

AIRCRAFT TYPES

The two primary types of aircraft used are:

- Fixed-wing (airplane)
- Rotary wing (helicopter)

Visual 2.14

AIRPLANES (FIXED-WING)

Fixed-wing aircraft are used regularly for daily project work including the following:

- Point-to-point transportation of personnel or supplies
- Aerial reconnaissance and/or surveillance
- Communications relay
- Aerial mapping
- Aerial seeding

Airplanes may require either Aviation Fuel (Av Gas 100/130) or Jet Fuel (Jet A, JP- 4, 5 or 8) depending on the type of power plant (e.g. piston, turbine/turbo-prop, jet engine).

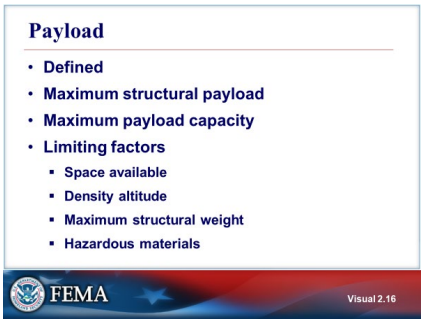
Visual 2.15

HELICOPTERS (ROTARY WING)

Helicopters may be used regularly for missions related to the following:

- Passenger and/or cargo transport
- External load operations
- Aerial observation
- Aerial still and video photography, video downlink and thermal imagery use
- Law enforcement support missions
- Search and Rescue including hoist rescues
- Aerial firefighting

Helicopters may require either Aviation Fuel (Av Gas 100/130) or Jet Fuel (Jet A, JP- 4, -5, or -8) depending on the type of power plant (e.g. piston, turbine). The vast majority of helicopters encountered at incidents will be turbine and use Jet A fuel. There are only a couple of piston helicopters that you might encounter, but they are rare. Use of piston helicopters may be prohibited by policy in some agencies and is generally prohibited on most Wildland Fire operations.



Visual 2.16

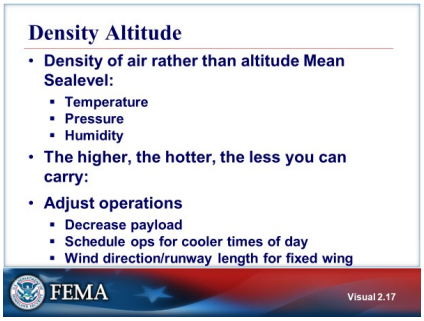
PAYLOAD

Payload is defined as the total weight of passengers, fuel, and internal cargo that an aircraft carries or can carry.

Maximum structural payload is the maximum demonstrated payload to be carried without stressing the aircraft fuselage; this includes internal and external cargo.

14 CFR 110.2 defines maximum payload capacity as the maximum certificated takeoff weight of an aircraft, less the empty weight, less all justifiable aircraft equipment, and less the operating load, consisting of minimum fuel load, oil, and flight crew.

The major limiting factors for payload are the space available and the aircraft maximum structural weight. Other limiting factors include density altitude and hazardous materials. Public aircraft are allowed to carry some hazardous materials such as fuel and fusees used in fighting wildfires; however, civil aircraft cannot carry hazardous materials.



Visual 2.17

DENSITY ALTITUDE

Density altitude in simple terms is the altitude when measured in terms of how dense the air is rather than the altitude in terms of the mean sea level.

The pilot will be very aware of the effect of density altitude on the performance of the aircraft and it will be a factor in determining whether a mission can be accepted.

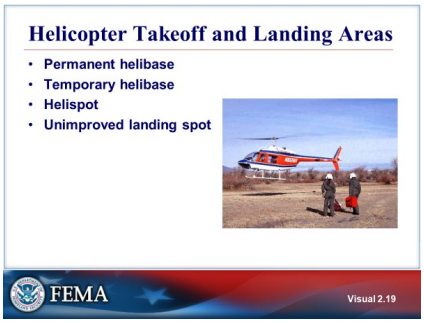
Although you may not need to have an in-depth knowledge of density altitude, it is important for anyone involved in air operations to understand the concept and how it affects aircraft performance.

Visual 2.18

FIXED-WING TAKEOFF AND LANDING AREAS

The location of a fixed-wing takeoff and landing area should be as close as possible to the incident. There may be a full service airport available or a smaller airport with limited services. Issues that should be considered include the following:

- **Runway length:** Runway length and composition may have an effect on fixed-wing operations. Some aircraft require longer runways depending on load and density altitude conditions, while others may get by with shorter runways for all operations.
- **Control Tower:** Whether an airport has an operational control tower is not as critical as the airport having an instrument approach capability. Many smaller airports with no control towers have no instrument approach capability. This could limit operations to Visual Flight Rules (VFR) only. Furthermore, if adequate runway lighting is not available, operations could be limited to daytime VFR only.
- **Fuel:** On-field fuel availability is a must for fixed-wing operations. Where fuel is not available, it can be brought in via local agency resources if available, or commercial vendors. Remote fuel stops for helicopter operations can be set up at heliports or helistops.
- **Ramps:** Ramp space acquired for the purpose of loading and unloading cargo and passengers must be large enough to accommodate the operations and also provide a zone of safety for all personnel.
- **Aircraft maintenance:** Usually, maintenance facilities and providers can be found at larger municipal airports. However, in some remote areas, this may be a problem. This capability is normally needed to address non-scheduled maintenance issues.
- **Facilities and Security:** Facilities for crew support and ramp security will have to be provided for all extended operations.



Visual 2.19

HELICOPTER TAKEOFF AND LANDING AREAS

Permanent helibase: A permanent helibase is the permanent home base of helicopters and personnel. This may accommodate several helicopters (e.g. National Guard/military) or one (e.g. hospital-based medical helicopter). Permanent helibases have adequate fueling facilities, a reliable wind indicator, signs, fire extinguisher, paved pad, vehicle parking areas and reliable communications (telephone and/or radio).

Temporary helibase: A temporary helibase is activated intermittently as the need arises. It should contain most of the facilities required for a permanent helibase. It should be located in the vicinity of incident operations. A large incident may require more than one temporary helibase. Facilities should include parking areas for refueling and maintenance trucks, rest areas for pilots and crews, reliable communications, and an operations coordination site.

Helispot: A helispot is a natural or improved takeoff and landing area intended for temporary or occasional helicopter use. It may or may not have road access, but should have a wind indicator, if possible.

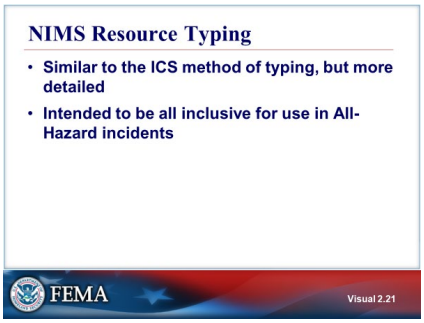
Unimproved landing area: An unimproved landing area is used only at the discretion of the pilot, and is typically intended for one-time use only. Unimproved landing areas are commonly used in search and rescue.

Visual 2.20

NWCG ICS AIRCRAFT TYPING

that the National Wildfire Coordinating Group (NWCG) has developed ICS Aircraft Typing to distinguish the different types, sizes, and capabilities of both fixed- wing and helicopters to manage aerial fire resources. Typing took the guesswork out of what type of aircraft to order.

Helicopters are typed as I, II, or III based on passenger seats, minimum allowable payload and minimum gallons of water or retardant carrying capability.



Visual 2.21

NIMS RESOURCE TYPING

The National Mutual Aid and Resource Management Initiative supports NIMS by establishing a comprehensive, integrated system that provides the basis for typing, ordering and tracking all Federal, State, and local response assets.

For ease of ordering and tracking, response assets such as aircraft and related equipment and personnel are categorized via resource typing based on size, capacity, mission, capability, qualifications and training. Although similar to the NWCG method of typing, the NIMS resource typing model employed by FEMA is far more detailed and is intended to be all inclusive for use in All-Hazard incidents, covering all disciplines in support of mutual aid requests throughout the country.

As a result of this resource typing process, a resource's capability is readily defined and an Emergency Manager is able to effectively and efficiently request and receive resources such as aircraft and crews through mutual aid during disasters.

Visual 2.22

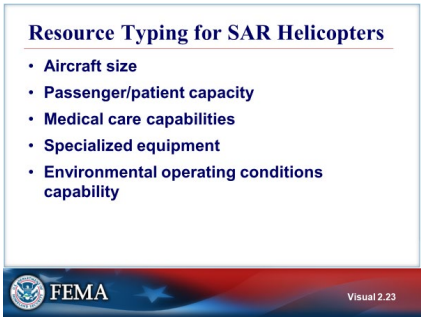
NIMS AIRCRAFT TYPING

Aircraft typing:

- Typing ranges from Type I through Type IV.
- A Type I resource is normally the largest in size and capacity or has the greatest capability of performing all aspects of the given mission with the most qualified crews.
- As typing ranges from I through IV, size and capacity of the aircraft may diminish and the capability of the aircraft and crew may be limited.

Fixed-wing aircraft and helicopters and crews are typed separately within their respective disciplines should there be missions or requirements related to both.

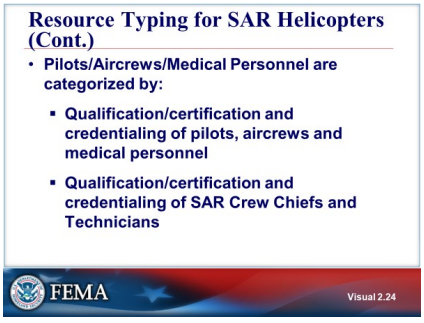
Pilot and crew qualifications and training are included in the resource typing matrix along with the specialized equipment needed for the specific mission within the respective discipline.



Visual 2.23

RESOURCE TYPING FOR SAR HELICOPTERS

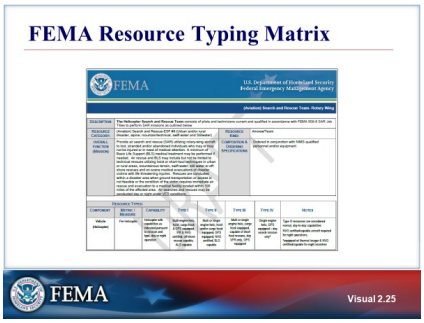
In the resource typing guide provided, the SAR helicopters and SAR teams are typed I through IV according to aircraft size, passenger/patient capacity, medical care capabilities, specialized equipment and environmental operating conditions capability.



Visual 2.24

RESOURCE TYPING FOR SAR HELICOPTERS (CONT.)

Pilots, aircrews and medical personnel are categorized based on NIMS credentialing criteria related to pilot qualifications and ratings and the qualifications to include level of training of NIMS credentialed SAR Crew Chiefs and Technicians.

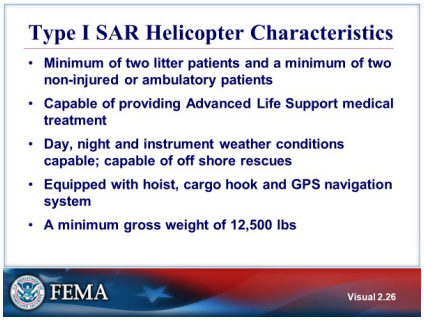


Visual 2.25

FEMA RESOURCE TYPING MATRIX

Refer to Handout 2-2: FEMA Resource Typing Matrix for Rotary Wing Search and Rescue (SAR).

Handout 2-2: FEMA Resource Typing Matrix for Rotary Wing Search and Rescue (SAR) summarizes the minimum specifications for the typing of SAR helicopters and crews based on the number of passenger/patient seats, allowable payload, specialized equipment, daytime/nighttime/weather capabilities and the level of medical treatment provided. When a Rotary Wing SAR Team is referred to by type, for example, as a Type II Rotary Wing SAR Team, it must have met the minimum specifications outlined on the table for a Type II Team, which includes the helicopter, crew, equipment, and medical services provided.

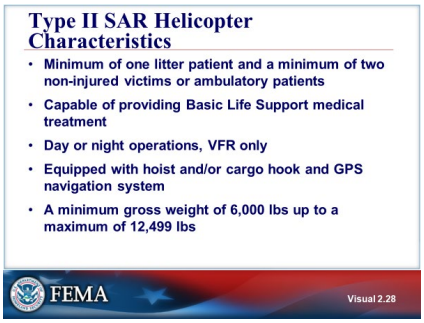


Visual 2.26

TYPE I SAR HELICOPTER CHARACTERISTICS

Visual 2.27

EXAMPLES OF TYPE I SAR HELICOPTERS

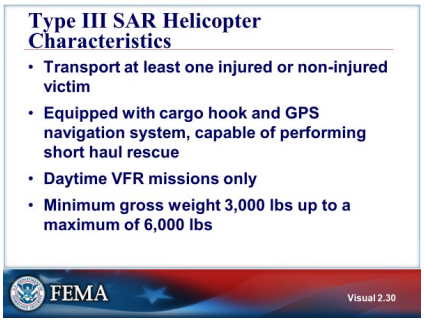


Visual 2.28

TYPE II SAR HELICOPTER CHARACTERISTICS

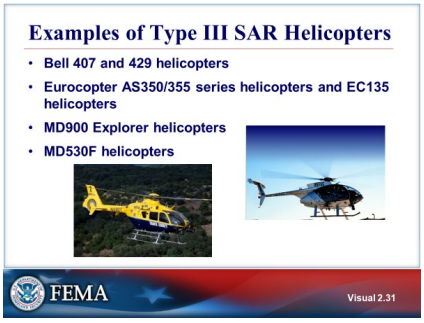
Visual 2.29

EXAMPLES OF TYPE II SAR HELICOPTERS



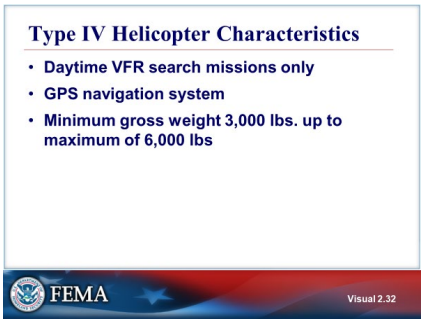
Visual 2.30

TYPE III SAR HELICOPTER CHARACTERISTICS



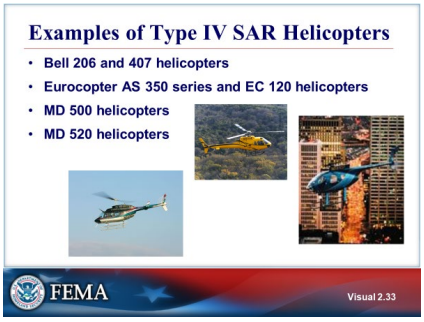
Visual 2.31

EXAMPLES OF TYPE III SAR HELICOPTERS



Visual 2.32

TYPE IV HELICOPTER CHARACTERISTICS



Visual 2.33

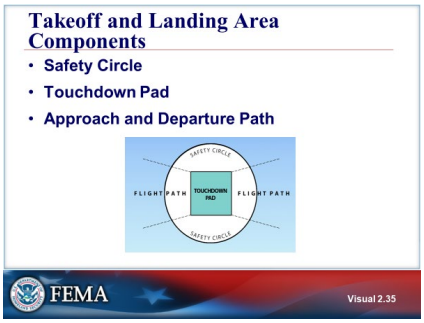
EXAMPLES OF TYPE IV SAR HELICOPTERS

Visual 2.34

HELIBASE AREA REQUIREMENTS

The helibase needs to be large enough to accommodate and have a surface that will support the type and amount of helicopters anticipated to be used at the incident. It is desirable to select an area that can be expanded if additional helicopters are needed. Another consideration when looking at surfaces is the concern for the potential for staring fires if using dry, grass fields.

The helibase should be located far enough away from any sleeping areas so that incident personnel are not disturbed by the noise of the helibase operations. It should also be located where helicopters do not have to fly over busy roads and populated areas. Locations for helibases are normally selected by qualified air operations personnel.



Visual 2.35

TAKEOFF AND LANDING AREA COMPONENTS

Safety Circle: This is a safety zone that surrounds the landing area and provides an obstruction-free area on all sides of the takeoff and landing area.

Touchdown Pad: It is preferred that a helicopter's skids or wheels will come to rest on this part of the takeoff and landing area.

Approach and Departure Path: A clear flight path is selected for flight extending upward and outward from the touchdown pad and safety circle, and into the prevailing wind.

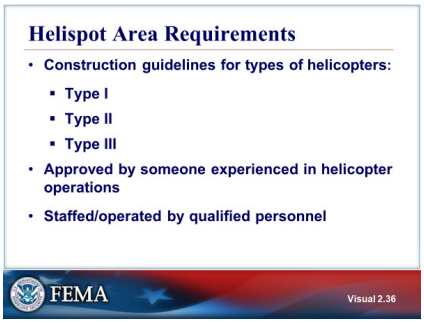
The approach and departure path at a helispot is ideally 360 degrees. When this is not possible there should be at least separate approach and departure paths into the wind. Wind socks or flagging should be put up to indicate wind direction.

The minimum width of the paths should be at least the same as the diameter of the corresponding safety circle. Widening the paths 20 degrees from the safety circle and extending them for a distance of 300 feet will improve the safety of the area.

The approach and departure paths should:

- Be cleared of all obstacles higher than the touchdown pad
- Be cleared of all obstacles for a distance of 300 feet along the paths
- Not overfly structures, inhabited areas, personnel, and vehicle parking areas

Sometimes the aircraft may have to take off the same path it landed if there are hazards such as trees obstructing one side. It is best when there is a two-way path.



Visual 2.36

HELISPOT AREA REQUIREMENTS

The following minimum guidelines should be used in the construction of helispots:

- NIMS Type I helicopters:

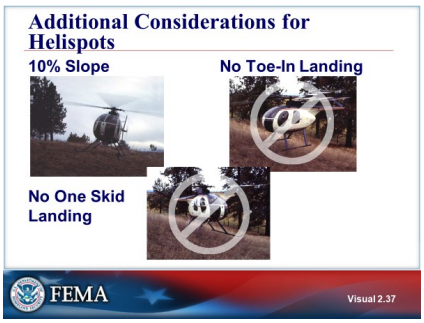
  The safety circle could be up to 150 feet in diameter (1½ times the rotor diameter) depending on the size of the helicopters anticipated. The touchdown pad should be 40 feet by 40 feet and capable of supporting more than 12,500 lbs.

- NIMS Type II helicopters:

  The safety circle should be at least 110 feet in diameter (1½ time the rotor diameter). The touchdown pad should be 20 feet by 20 feet and capable of supporting up to 12,500 lbs.

- NIMS Type III helicopters:

  The safety circle should be at least 90 feet in diameter (1½ times the rotor diameter). The touchdown pad should be 15 feet by 15 feet and capable of supporting up to 6,000 lbs.



Visual 2.37

ADDITIONAL CONSIDERATIONS FOR HELISPOTS

The touchdown pad should be as level as possible and should not exceed a 10% slope. It should be large and firm enough to support the weight of the helicopter. Toe-in landings and one skid landings should not be allowed.

Once a helispot has been constructed, the area should be approved by someone experienced in helicopter operations (e.g. Air Support Group Supervisor) and must be staffed and operated by qualified personnel. However, the pilot makes the final decision to land on any helispot, so talk to the pilot when looking for helispots.

Visual 2.38

HELISPOT TOUCHDOWN AND SAFETY CIRCLE

Touchdown Pad

- As level as possible, not exceed 10% slope
- Large and firm enough to support the weight of the helicopter

Safety Circle

- Cleared to 1½ times the rotor diameter of the helicopter used
- Cleared of debris to ground surface level with as little disturbance to surface vegetation and soil as possible
- Cleared of anything that might interfere with the helicopter's landing gear or tail rotor

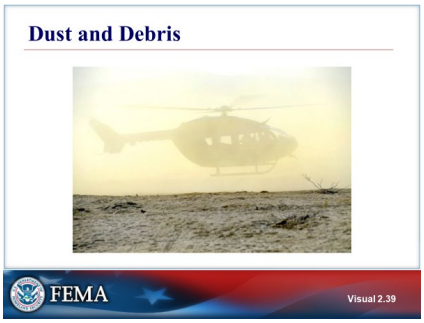
Approach and Departure Path

The approach and departure path at a helispot is ideally 360 degrees. When this is not possible there should be at least separate approach and departure paths into the wind. Wind socks or flagging should be put up to indicate wind direction.

The minimum width of the paths should be at least the same as the diameter of the corresponding safety circle. Widening the paths 20 degrees from the safety circle and extending them for a distance of 300 feet will improve the safety of the area.

The approach and departure paths should:

- Be cleared of all obstacles higher than the touchdown pad
- Be cleared of all obstacles for a distance of 300 feet along the paths
- Not overfly structures, inhabited areas, personnel, and vehicle parking areas
- Should not overfly power lines

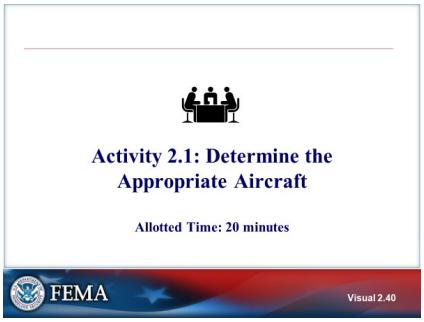


Visual 2.39

DUST AND DEBRIS

Visibility problems and aircraft engine and component damage can occur if debris is not cleared or the helispot is poorly maintained.

Clearing debris to ground surface level with as little disturbance to surface vegetation and soil as possible will help control dust. Keeping the landing area moist with water will also control dust.



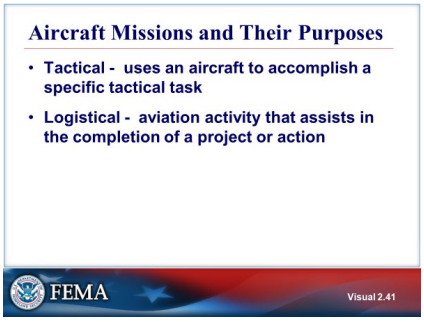
Visual 2.40

ACTIVITY 2.1: DETERMINE THE APPROPRIATE AIRCRAFT

The instructor will explain Activity 2.1.

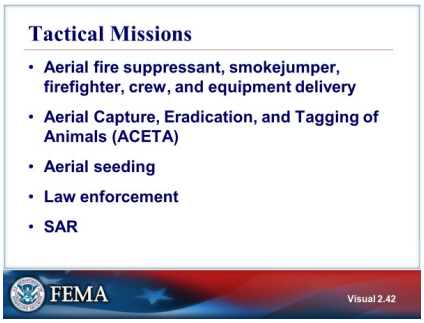
You will have 20 minutes to complete the activity.

A copy is provided of the FEMA Resource Typing Matrix for Rotary Wing Search and Rescue (SAR) in the Supplemental Materials or you can access it from this website.
https://rtlt.preptoolkit.fema.gov/Public/Resource/View/8-508-1162?q=rotary%20wing



Visual 2.41

AIRCRAFT MISSIONS AND THEIR PURPOSES



Visual 2.42

TACTICAL MISSIONS

Examples of tactical missions:

- Aerial fire suppressant, smokejumper, firefighter, crew and equipment delivery
- Aerial Capture, Eradication, and Tagging of Animals (ACETA): Government land managers and wildlife biologists use aircraft regularly to accomplish specific resource management goals for programs such as:
    - Roundups of wild horses
    - Animal capture and tagging
    - Animal relocation
    - Animal tracking
- Aerial seeding: When a large fire destroys extensive areas of vegetation, aerial seeding may be used to dispense seeds over a large area.
- Law enforcement: Government law enforcement uses aircraft for law enforcement missions such as:
    - Patrols
    - Surveillance
    - Access to remote areas
    - Drug interdiction
- SAR: Because of their capabilities, aircraft are often used for SAR missions. Airplanes can cover a large area quickly, while helicopters can concentrate on a general area for more precise coverage.

Visual 2.43

LOGISTICAL MISSIONS

Logistical missions as any aviation activities used to assist in the completion of a project that is not, in itself, tactical in nature. Logistical missions include the following:

- Transportation of people and supplies to the area or project.
- External load operations: Supplies are often air lifted by external load to relief victims in remote areas or areas cut off from roads or vehicle traffic.
- Fire perimeter mapping: Aircraft are used to map the perimeter of large fires and prescribed burns.
- Detection and reconnaissance: Aircraft are often used for detection and reconnaissance because of their ability to cover large areas quickly, provide a better visual vantage point, and safety issues.
- Medical evacuation and aid: Aircraft can be used to deliver medically trained personnel to the scene of an accident and to transport injured personnel to medical facilities.
- Infrared mapping: Heat-detecting devices can be mounted on or operated from an aircraft and may be used for firefighting, weather, or law enforcement operations when visibility is limited.
- Aerial photography and video recording: Aerial photography and video recording may be used for fire behavior documentation, training purposes, and public relations (news media) efforts.

Visual 2.44

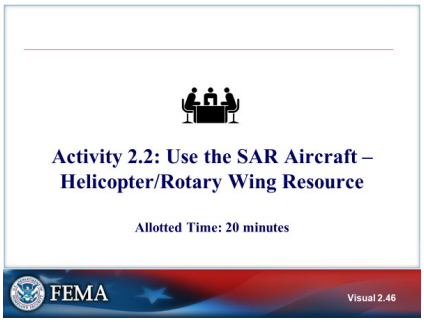
AIRCRAFT SELECTION CRITERIA

Specific aircraft for specific missions are selected and assigned by Dispatchers, Aviation Managers, or incident air operations personnel based on the following criteria:

- Mission accomplishment: When selecting aircraft, consideration must be given to which aircraft type can best accomplish the task under the existing conditions.
- Aircraft operational requirements: A mission may require a specific make or model of aircraft based on performance criteria (such as the need for an air tanker).
- Aircraft payload: The aircraft selected for a specific mission must have the capability to transport the number of passengers or pounds of cargo required.
- Aircraft speed: When selecting aircraft, the timeframes needed should be considered (Airplanes are generally faster than helicopters).
- Aircraft range: When selecting aircraft, the distance that needs to be covered must be considered(Airplanes generally can fly a longer distance without a fuel stop than helicopters).
- Cost: Cost should always be considered when selecting aircraft for a mission. In general, operating costs for helicopters are higher than the operating costs for airplanes.
- Logistics: Aircraft availability, sources, flight distance, and the time involved for aircraft use must also be considered.
- Landing site: Airplanes generally require longer and more improved landing areas (e.g. airports). Helicopters are more versatile in terms of where they are able to land (e.g. helibases, helispots).

Visual 2.45

AIRCRAFT SOURCES

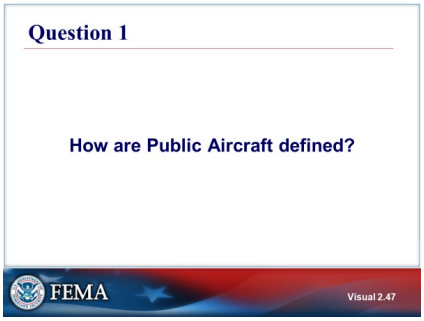


Visual 2.46

ACTIVITY 2.2: USE THE SAR AIRCRAFT-HELICOPTER/ROTARY WING RESOURCE

The instructor will explain Activity 2.2.

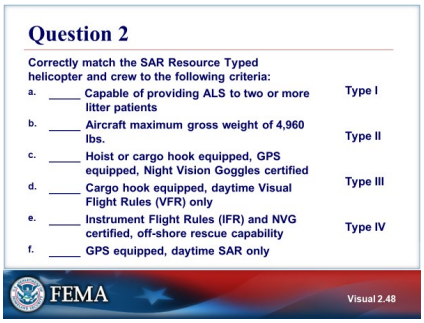
You will have 20 minutes to complete the activity.



Visual 2.47

QUESTION 1

How are Public Aircraft defined?



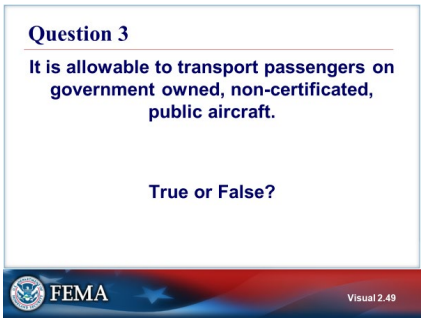
Visual 2.48

QUESTION 2

Correctly match the SAR resource type helicopter and crew to the following criteria:

- Type I
- Type II
- Type III
- Type IV

a) __ Capable of providing ALS to two or more litter patients
b) __ Aircraft maximum gross weight of 4960 lbs.
c) __ Hoist or cargo hook equipped, GPS equipped, NVG certified
d) __ Cargo hook equipped, day Visual Flight Rules (VFR) only
e) __ IFR & NVG certified, off-shore rescue capable
f) __ GPS-equipped, day search mission only

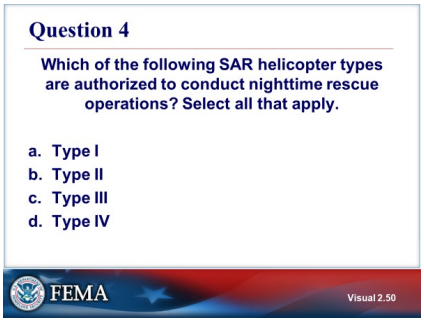


Visual 2.49

QUESTION 3

It is allowable to transport passengers on government owned, non-certificated, public aircraft.

a. True
b. False

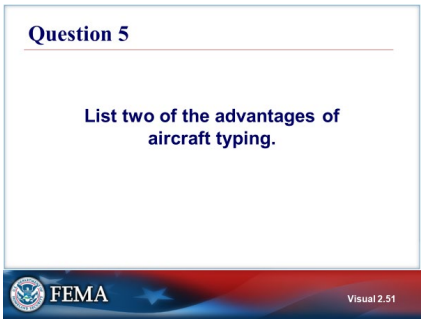


Visual 2.50

QUESTION 4

Which of the following SAR helicopter types are authorized to conduct night rescue operations? Select all that apply.

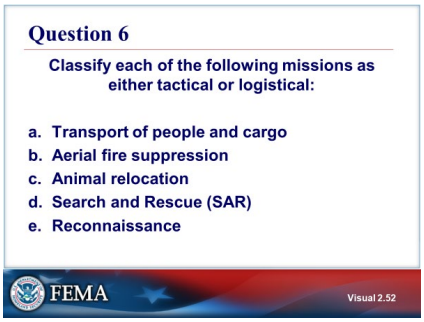
a. _____Type I
b. _____Type II
c. _____Type III
d. _____Type IV



Visual 2.51

QUESTION 5

List two of the advantages of aircraft typing.

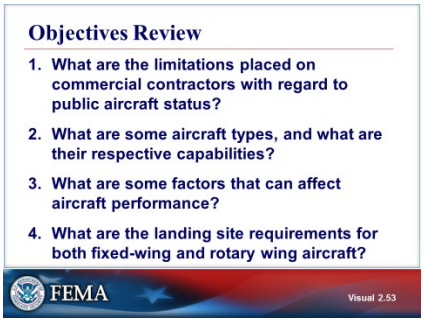


Visual 2.52

QUESTION 6

Classify each of the following missions as either tactical or logistical:

a. Transport of people and cargo
b. Aerial fire suppression
c. Animal relocation
d. Search and rescue (SAR)
e. Reconnaissance

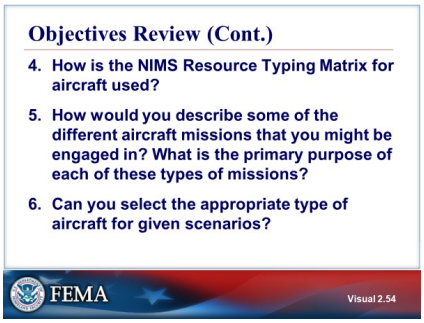


Visual 2.53

OBJECTIVES REVIEW

Unit Enabling Objectives

- Describe the steps involved in designating commercial contractor aircraft as public aircraft.
- Describe the various aircraft types and their capabilities.
- Describe the various factors that can affect aircraft performance.
- Describe the landing site requirements for both fixed-wing and rotary wing aircraft.



Visual 2.54

OBJECTIVES REVIEW (CONT.)

- Explain the National Incident Management System (NIMS) Resource Typing Matrix for aircraft.
- Explain the two types of aircraft missions and provide examples of each.
- Select the appropriate type of aircraft for given scenarios.

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Supplemental Materials

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Activity 2.1: Determine the Appropriate Aircraft

Unit 2 — Activity 2.1

Purpose

The purpose of this activity is to help students gain familiarity with the FEMA Resource Typing Matrix for Rotary Wing Search and Rescue (SAR) and provide them with experience in determining the appropriate aircraft for a given scenario.

Objectives

Students will accomplish the following:

- Answer questions based on a given scenario using FEMA Resource Typing Matrix for Rotary Wing Search and Rescue (SAR).

Activity Structure

This activity is scheduled to last approximately 20 minutes, including the individual activity and classroom discussion. After the instructor reads the scenario aloud to the class, the students will work individually to answer the questions provided. The students will use FEMA Resource Typing Matrix for Rotary Wing Search and Rescue (SAR) and the knowledge they gained in Unit 2.

Rules, Roles, and Responsibilities

The following are the specific activities / instructions for your participation in this activity:

1. Review the activity scenario.
2. Record your answers to the questions in the space provided on this handout.
3. Be prepared to share your answers with the rest of the class.

Instructors moderate discussions, answer questions and provide additional information as required.

Activity 2.1 Schedule

Activity	Duration	Participation Type
Activity Introduction and Overview	2 minutes	Classroom
Activity	10 minutes	Individual
Review/Discussion	10 minutes	Classroom

Activity 2.1 Scenario

There are several individuals stranded on their rooftops, unable to reach dry land due to massive flooding. You are to determine the appropriate SAR helicopter to search for the stranded residents, evacuate them from their rooftops, and transport them to a First Aid Station set up at a high school which is several miles away. Although the weather is marginal in some areas, no rain is in the forecast and visibility will allow for Visual Flight Rules (VFR) operations in most areas.

Activity 2.1 Questions

1. Using FEMA Resource Typing Matrix for Rotary Wing Search and Rescue (SAR), which Type (I – IV) of SAR helicopter will you choose?

2. What method for air lifting the residents from their rooftops will you employ?

3. What impact will the travel distance have on your decision?

Activity 2.1: SEARCH AND RESCUE AIRCRAFT – HELICOPTER/ROTARY WING

https://rtlt.preptoolkit.fema.gov/Public/Resource/View/8-508-1162?q=rotary%20wing

DESCRIPTION	The Search and Rescue (SAR) Aircraft – Helicopter/Rotary Wing resource is equipped to conduct helicopter-based search, rescue, and recovery operations.		
RESOURCE CATEGORY	Search and Rescue	**RESOURCE KIND**	Aircraft
OVERALL FUNCTION	1. Provides air SAR using rotary wing aircraft during day or night under Visual Meteorological Conditions (VMC) 2. Completes SAR personnel insertion or extraction and SAR equipment transport 3. Performs air SAR that includes technical rescues, hoist or short-haul techniques, specialized helicopter operations in all water environments such as swiftwater, and evacuation 4. Provides medical care that includes Basic Life Support (BLS) and transport to Advanced Life Support (ALS) providers 5. Operates in environments with or without infrastructure, including those with compromised access to roadways, utilities, transportation, or medical facilities, and with limited availability to shelter, food, and water	**COMPOSITION AND ORDERING SPECIFICATIONS**	1. Discuss additional requirements prior to deployment, including: a. Communications beyond the resource's intra-team communications, such as command, logistics, aircraft, and military b. Additional specialized personnel, such as advanced medical personnel, animal SAR personnel, or helicopter support personnel c. Any contaminated environments and related personal protective equipment (PPE), respiratory protection, clothing, and equipment d. Resource logistics support, such as security or force protection, lodging, transportation, and meals 2. Deploys with a full complement of personnel, unless requested otherwise, and the requestor provides a Flight Observer 3. Hours per shift and duration must comport with Federal Aviation Administration (FAA) regulations 4. Personnel numbers listed reflect those reasonably necessary to conduct operations safely; agreement between the requestor and provider can adapt team positions within the personnel numbers 5. The requestor should base the number of requested aircraft on the nature and magnitude of mission, logistics, intensity of demand, and duration of service activity 6. The requestor determines and specifies mission operations under Instrument Flight Rules (IFR) or using night vision goggles (NVG) 7. The requestor should specify special environmental capabilities and load needs during ordering

RESOURCE TYPES			TYPE 1	TYPE 2	TYPE 3	TYPE 4
COMPONENT	**METRIC/ MEASURE**	**CAPABILITY**				
Personnel	Per Team	Minimum	5	4	Same as Type 4	3
			NOTES: Not Specified			
Personnel	Per Team	Management and Oversight	Same as Type 2	Same as Type 3	Same as Type 4	Same as Type 5
			NOTES: Pilot should have training for NVG use and have a rating to operate in IFR conditions.			

RESOURCE TYPES			TYPE 1	TYPE 2	TYPE 3	TYPE 4
COMPONENT	**METRIC/ MEASURE**	**CAPABILITY**				
Personnel	Per Team	Operations and Support	Same as Type 2, PLUS: 1 - NIMS Type 1 Emergency Medical Technician (EMT)	Same as Type 3, PLUS: 1 - NIMS Type 1 Helicopter SAR Crew Chief	Same as Type 4	Same as Type 5, PLUS: 1 - NIMS Type 1 Helicopter SAR Technician
			NOTES: 1. Crew Chief and Technician should have training for NVG operations. 2. Flight Observer is not a NIMS typed support position and the requestor should acquire locally. The position is not a part of the crew and does not deploy with the aircraft.			

Capability	Per Aircraft	Functions	Same as Type 2, PLUS: 1. Multi-engine 2. Capability to provide medical attention for at least two persons being transported	Same as Type 3, PLUS: 1. Night operations 2. IFR capable 3. NVG capable	Same as Type 4	Same as Type 5, PLUS: 1. Rescue capability 2. Ability to transport at least two persons, one of which can be in a litter
			NOTES: Only crew members with certification in accordance with Authority Having Jurisdiction (AHJ) requirements may administer medical care, including BLS.			
Equipment	Per Aircraft	Operations	Same as Type 2	Same as Type 3, PLUS: 1. NVG 2. IFR equipment	Same as Type 4, PLUS: Access, rescue, and recovery equipment, including: 1. Air rescue litter 2. Straps 3. Baskets 4. Human cargo hoist 5. Dual external hooks or hook and harness/ backup 6. BLS level care and equipment	Same as Type 5, PLUS: 1. Human cargo dual external hooks or hook and harness/ backup 2. One litter or ability to carry one person flat
			NOTES: Recommend for daylight search only unless the aircraft is equipped with a thermal imager, search light, or NVG certified/capable aircraft for night searches.			
Equipment	Per Aircraft	Communications	Same as Type 2, PLUS: Dual VHF aviation radios	Same as Type 3	Same as Type 4	Same as Type 5
			NOTES: 1. Intra- team and inter- team communications should be consistent with National Interoperability Field Operations Guide (NIFOG). **2. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs.**			

RESOURCE TYPES			TYPE 1	TYPE 2	TYPE 3	TYPE 4
COMPONENT	METRIC/ MEASURE	CAPABILITY				
Equipment	Per Team Member	PPE	Same as Type 2	Same as Type 3	Same as Type 4	Same as Type 5
			NOTES: PPE should meet requirements in 29 Code of Federal Regulations (CFR) Part 1910.134 Respiratory Protection and 29 CFR Part 1910.1030 Bloodborne Pathogens.			
RESOURCE TYPES			TYPE 5	NO TYPE 6	NO TYPE 7	NO TYPE 8
COMPONENT	METRIC/ MEASURE	CAPABILITY				
Personnel	Per Team	Minimum	2	Not Applicable	Not Applicable	Not Applicable
			NOTES: Not Specified			
Personnel	Per Team	Management and Oversight	1 - National Incident Management System (NIMS) Type 1 Helicopter SAR Pilot	Not Applicable	Not Applicable	Not Applicable
			NOTES: Pilot should have training for NVG use and have a rating to operate in IFR conditions.			
Personnel	Per Team	Operations and Support	1 - Flight Observer	Not Applicable	Not Applicable	Not Applicable
			NOTES: 1. Crew Chief and Technician should have training for NVG operations. 2. Flight Observer is not a NIMS typed support position and the requestor should acquire locally. The position is not a part of the crew and does not deploy with the aircraft.			
Capability	Per Aircraft	Functions	1. Search only 2. Aircraft may be multi- or single-engine 3. Operates under Visual Flight Rules (VFR) 4. Day operations only	Not Applicable	Not Applicable	Not Applicable

			NOTES: Only crew members with certification in accordance with Authority Having Jurisdiction (AHJ) requirements may administer medical care, including BLS.			
Equipment	Per Aircraft	Operations	1. Aviation Global Positioning System (GPS) equipped 2. Equipment suitable for day operations 3. Portable Basic First Aid equipment 4. Gyro-stabilized handheld binoculars 5. Spare batteries	Not Applicable	Not Applicable	Not Applicable
			NOTES: Recommend for daylight search only unless the aircraft is equipped with a thermal imager, search light, or NVG certified/capable aircraft for night searches.			
RESOURCE TYPES			**TYPE 5**	**NO TYPE 6**	**NO TYPE 7**	**NO TYPE 8**
COMPONENT	**METRIC/ MEASURE**	**CAPABILITY**				
Equipment	Per Aircraft	Communications	1. Two-way handheld radios 2. Portable radios with ground to air capability 3. Single Very High Frequency (VHF) aviation radio 4. Programmable VHF/Ultra High Frequency (UHF) P25 Radio for air- to-ground communications 5. Marine band radio 6. Electronic direction finder 7. Mobile phones and waterproof bag 8. Handi-mikes or ear/headsets	Not Applicable	Not Applicable	Not Applicable

			NOTES: 1. Intra- team and inter- team communications should be consistent with National Interoperability Field Operations Guide (NIFOG). 2. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs.			
Equipment	Per Team Member	PPE	Minimum PPE, including: 1. Aviation Life Support Equipment (ALSE) in accordance with AHJ definitions and commensurate with the operating environment 2. Flight helmet and other helmets 3. Headlamps 4. Eye and hearing protection 5. Respiratory protection 6. Uniforms, gloves, and other protective clothing	Not Applicable	Not Applicable	Not Applicable
			NOTES: PPE should meet requirements in 29 Code of Federal Regulations (CFR) Part 1910.134 Respiratory Protection and 29 CFR Part 1910.1030 Bloodborne Pathogens.			

COMMENTS

1. Ground safety assurance and air traffic control are important support necessities for injury and crash prevention. This support may be significant depending upon the size and location of the incident.
2. Factors such as the nature and volume of the mission, logistics, intensity of demand, duration of service activity, and allowances for crew rest determine the quantity of air rescue resources necessary.
3. Plan aviation maintenance. Unplanned maintenance may occur during deployment.
4. Plan hangar facilities for all extended operations.
5. Identify aviation fuel tankers or other supply points.
6. Team may need backup supplies and equipment depending upon the number of survivors and type, size, and scale of the event.
7. Aircraft communication equipment should be programmable for interoperability. The AHJ should verify this capability. The AHJ should provide all applicable communication frequencies and should verify a plan for augmenting existing communication equipment.
8. Plan for Landing Zone (LZ) space, clearance, and weight restrictions. The typical civilian air rescue helicopter needs an LZ of 150' x 150'. Military helicopters need a minimum LZ of 200” x 200”.

REFERENCES

1. FEMA, NIMS 509: Helicopter Search and Rescue Pilot
2. FEMA, NIMS 509: Helicopter Search and Rescue CrewChief
3. FEMA, NIMS 509: Helicopter Search and Rescue Technician
4. FEMA, NIMS 509: Emergency Medical Technician
5. American National Standards Institute/American Society of Safety Engineers (ANSI/ASSE) Z359.1-2007 Safety Requirements for Personal Fall Arrest Systems, Subsystems & Components
6. ASTM International (ASTM) F2209-14: Standard Guide for Training of Level I Land Search Team Member
7. Firefighting Resources of Southern California Organized for Potential Emergencies (FIRESCOPE) Field Operations Guide ICS 420-1, December 2012
8. National Fire Protection Association (NFPA) 1006: Standard for Technical Rescuer Professional Qualifications, 2013
9. NFPA 1582: Standard on Comprehensive Occupational Medical

Program for Fire Departments, 2013 10.NFPA 1670: Standard on Operations and Training for Technical Search and Rescue Incidents, 2014 11.NFPA 1983: Standard on Life Safety Rope and Equipment for Emergency Services, 2012

12. National Search and Rescue Committee, Catastrophic Incident Search and Rescue (CISAR) Addendum to the National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual, v. 3, June 2012
13. NWCG, Interagency Helicopter Operations Guide (IHOG), PMS 510, October 2013
14. Federal Aviation Administration (FAA) 14 Code of Federal Regulations (CFR) Part 139.319: Aircraft rescue and firefighting: Operational requirements
15. Occupational Health and Safety Administration (OSHA) 29 CFR Part 1910.120: Hazardous Waste Operations and Emergency Response
16. OSHA 29 CFR Part 1910.134: Respiratory Protection
17. OSHA 29 CFR Part 1910.1030: Bloodborne Pathogens

18.U.S. Department of Homeland Security, Office of Emergency Communications (OEC), National Interoperability Field Operations Guide (NIFOG), v. 1.4, January 2014

19.U.S. Department of the Interior (DOI), Helicopter Short-Haul Handbook (351 DM 1), February 2010

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

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Activity 2.2: Use the Search and Rescue (SAR) Aircraft – Helicopter/Rotary Wing Resource

Unit 2 – Activity 2.2

Purpose

The purpose of this activity is to solidify students' understanding of aircraft types and capabilities, as well as aircraft missions.

Objectives

Students will accomplish the following:

- Answer a series of questions regarding aircraft types and capabilities and aircraft missions.

Activity Structure

This activity is scheduled to last approximately 20 minutes, including the individual activity and classroom discussion. The instructor will read a series of questions aloud to the class. After the instructor reads each question, the students will have a few moments to record their answers on their Activity 2.2 handouts. Instructors will then ask several volunteers to provide their answers.

Rules, Roles, and Responsibilities

The following are the specific activities / instructions for your participation in the activity:

1. The instructor will read each question aloud to the class.
2. Record your answer to the question in the space provided on this handout.
3. Be prepared to share your answers with the rest of the class.

Instructors moderate discussions, answer questions and provide additional information as required.

Activity 2.2 Schedule

Activity	Duration	Participation Type
Activity Introduction and Overview	2 minutes	Classroom
Activity/Classroom Discussion	20 minutes	Classroom

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Activity 2.2 Questions

1. How are public aircraft defined?

   _____
   _____
   _____
   _____
   _____

2. Correctly match the SAR resource typed helicopter and crew to the following criteria:

Type I	a. _____ Capable of providing Advanced Life Support to two or more litter patients
Type II	b. _____ Aircraft maximum gross weight of 4,960 lbs.
Type III	c. _____ Hoist or cargo hook equipped, GPS equipped, Nigh Vision Goggles certified
Type IV	d. _____ Cargo hook equipped, daytime Visual Flight Rules (VFR) only
	e. _____ Instrument Flight Rules (IFR) and NVG certified, off-shore rescue capability
	f. _____ GPS equipped, daytime SAR only

3. Passengers are allowed to be transported on government owned, non-certificated, public aircraft?

   True or False?

   a. True
   b. False

4. Which of the following SAR helicopter types are authorized to conduct nighttime rescue operations?

   Select all that apply:

   a. _____Type I
   b. _____Type II
   c. _____Type III
   d. _____Type IV

5. List two of the advantages of aircraft typing:

   a. _____
   _____
   b. _____
   _____

6. Classify each of the following missions as either tactical or logistical:

   a. Transport of people and cargo: _____
   b. Aerial fire suppression: _____
   c. Animal relocation: _____
   d. Search and rescue (SAR): _____
   e. Reconnaissance: _____

Unit 3: Components of Air Operations

STUDENT MANUAL

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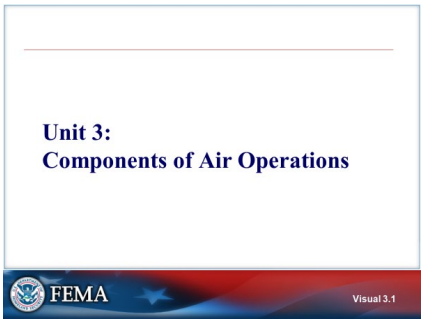
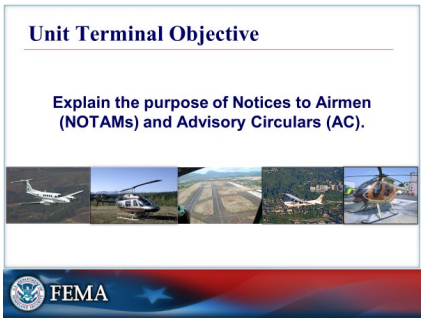


Visual 3.1

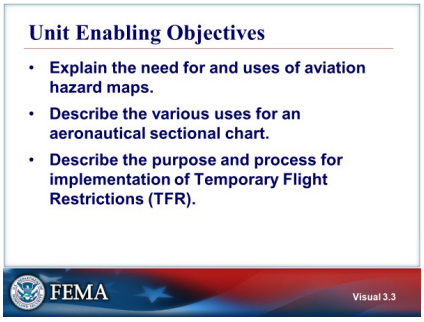
UNIT 3: COMPONENTS OF AIR OPERATIONS



Visual 3.2

UNIT TERMINAL OBJECTIVE

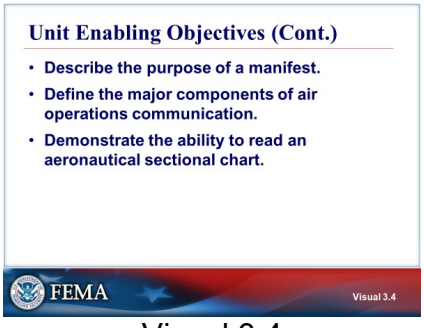
Explain the purpose of Notices to Airmen (NOTAMs) and Advisory Circulars (ACs).



Visual 3.3

UNIT ENABLING OBJECTIVES

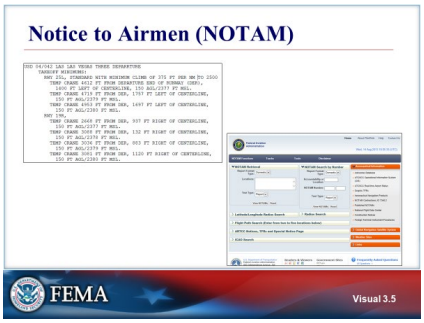
- Explain the need for and uses of aviation hazard maps.
- Describe the various uses for an aeronautical sectional chart.
- Describe the purpose of and process for implementation of Temporary Flight Restrictions (TFRs).



Visual 3.4

UNIT ENABLING OBJECTIVES (CONT.)

- Describe the purpose of a manifest.
- Define the major components of air operations communication.
- Demonstrate the ability to read an aeronautical sectional chart.



Visual 3.5

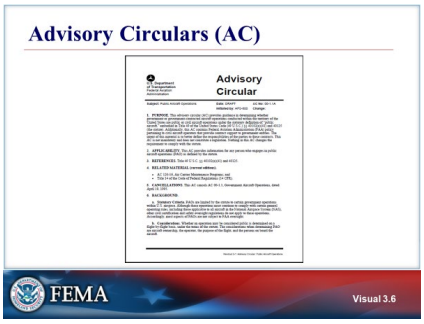
NOTICE TO AIRMEN (NOTAM)

A Notice to Airmen (NOTAM) is filed with an aviation authority to alert aircraft pilots of potential hazards along a flight route or at a location that could affect the safety of the flight. NOTAMs are created and transmitted by government agencies and airport operators.

NOTAMs are issued for a number of reasons, including for:

- Flights taken by important persons such as government representatives
- Closed runways
- Inoperable radio navigational aids
- Inoperable lights on tall obstructions
- Temporary erection of obstacles near airfields (e.g. cranes)
- Military exercise with resulting airspace restrictions

A search for applicable NOTAMs can be done through the FAA website at https://pilotweb.nas.faa.gov/PilotWeb/

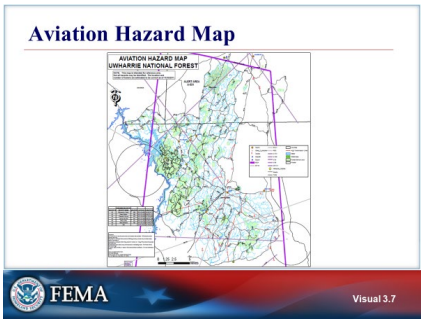


Visual 3.6

ADVISORY CIRCULARS (AC)

Advisory Circulars are publications issued by the FAA and international aviation authorities to provide guidance such as methods, procedures, and practices for complying with regulations and requirements. Advisory Circulars may also contain explanations of regulations and other guidance materials, best practices or information that is useful to the aviation community. Advisory Circulars do not create or change a regulatory requirement.

A list of current Advisory Circulars can be found on the FAA website at: http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.list/parentTopicID/96



Visual 3.7

AVIATION HAZARD MAP

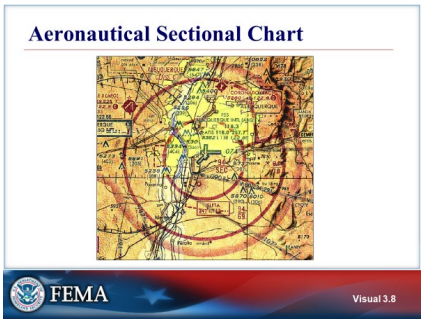
Aviation hazard maps should be prepared and may be an implied safety requirement under Federal/State Occupational Safety and Health Administration (OSHA) requirements. Even though many Federal agencies are largely immune to OSHA and several States are not bound by OSHA (non-OSHA States), aviation hazard maps are an agency requirement and State/local agencies should follow suit.

Aviation hazard maps display hazards such as:

- Power lines
- Military aircraft training routes
- Towers
- Special-use airspace
- Any other potential aviation hazards

These maps must be updated annually or as hazards change. The map and the hazards must be discussed with the pilot before agency flights are undertaken in these areas.

You can create a hazard map yourself by using road maps and talking to the aviators if they are not available. Producing these maps is the role of the ASGS or AOBD.



Visual 3.8

AERONAUTICAL SECTIONAL CHART

Aeronautical sectional charts are the primary navigational reference medium used by pilots who are flying under Visual Flight Rules (VFR). The chart uses a 1:500,000 scale and is designed for visual navigation of slow to medium speed aircraft.

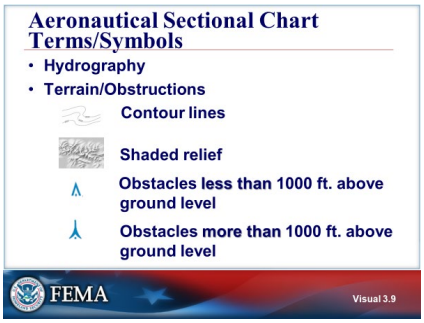
The topographic information featured consists of the relief and a selection of visual checkpoints. The checkpoints include:

- Populated places
- Drainage patterns
- Roads
- Railroads
- Other distinctive landmarks

Aeronautical information includes:

- Visual and radio navigational aids
- Airports
- Controlled airspace
- Restricted areas
- Obstructions

All aeronautical sectional charts include latitude and longitude markers of the area covered. These charts are updated every 6 months; most Alaska charts are updated annually.



Visual 3.9

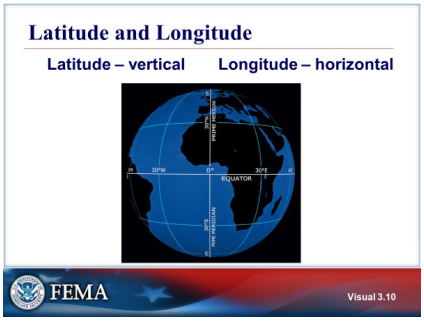
AERONAUTICAL SECTIONAL CHART TERMS/SYMBOLS

Hydrography**:** Two shades of blue are used to distinguish open water (shorelines) and inland water.

Terrain and Obstructions:

- **Contour lines** connect points on the earth of equal elevation.
- **Shaded relief** is used to indicate how the terrain might appear from the air.
- **Obstruction symbols** are used to depict man-made vertical features and are differentiated based on the object's height (less than or greater than 1000 feet above ground level)

Refer to the Explanation of VFR Terms and Symbols at this URL: https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/aero_guide/

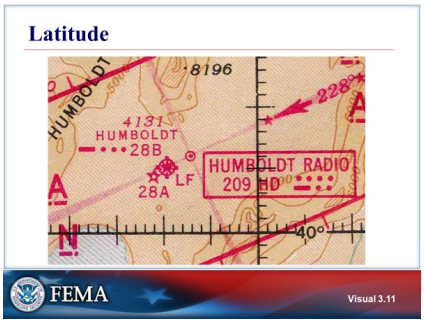


Visual 3.10

LATITUDE AND LONGITUDE

Latitude and longitude are a geographic coordinate system that enables every location on Earth to be specified by a set of numbers or letters. Latitude and longitude are specified in degrees, minutes, seconds. For this course, you will use only degrees and minutes.

Refer to Handout 3-1: Latitude and Longitude Procedures. Or access using this URL: https://gacc.nifc.gov/swcc/dispatch_logistics/aviation/Other/SWA_lat_long_info.pdf

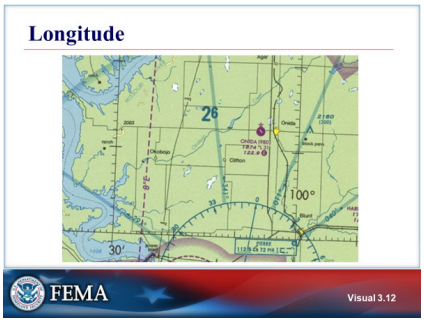


Visual 3.11

LATITUDE

Latitude Parallels:

- Latitude parallels are lines that trace horizontal circles on the surface of the Earth.
- Latitude lines are parallel to the equator and to each other. * The North Pole is 90° N and the South Pole is 90° S; the equator parallel of latitude is designated 0°.
- Parallels are designated north or south.



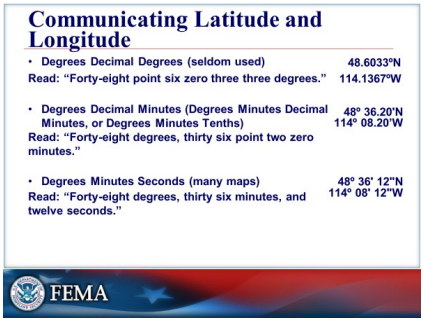
Visual 3.12

LONGITUDE

Meridian**:** A meridian is half of an imaginary great circle on the Earth's surface terminated by the North Pole and the South Pole,

Longitude Meridians:

- Longitude meridians are vertical points on the Earth's surface that angle east or west from a reference meridian to another meridian that passes through that point.
- The prime meridian passes through Greenwich, England.
- All meridians are designated east or west of the prime meridian.

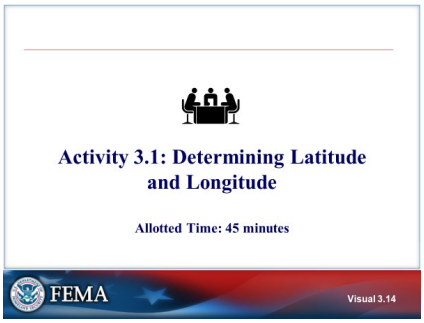


Visual 3.13

COMMUNICATING LATITUDE AND LONGITUDE

It is critical to use the correct punctuation when writing out the latitude and longitude and to use the correct wording when communicating latitude and longitude verbally in order to ensure the correct location is given.

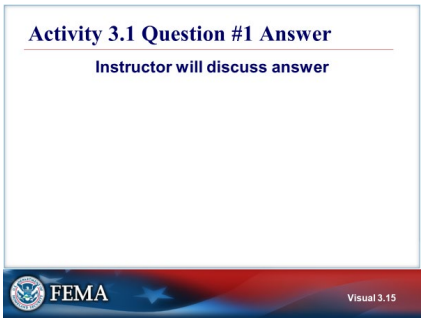
If the issue arises, the military uses the U.S. National Grid (USNG) system, but can convert to latitude and longitude.



Visual 3.14

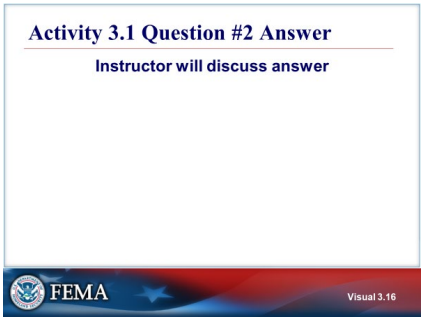
ACTIVITY 3.1: DETERMINING LATITUDE AND LONGITUDE

The instructor will explain Activity 3.1.



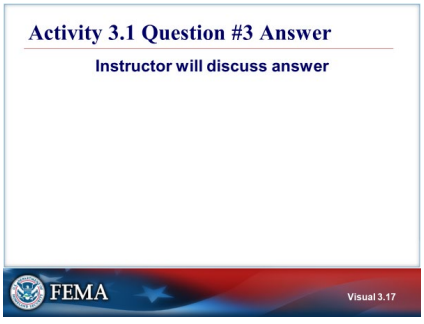
Visual 3.15

ACTIVITY 3.1 QUESTION #1 ANSWER



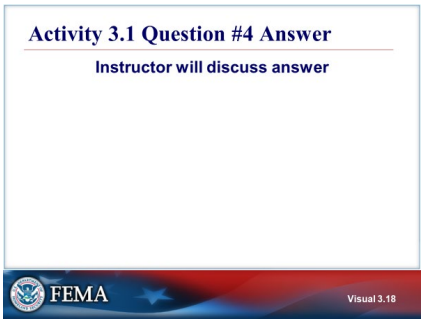
Visual 3.16

ACTIVITY 3.1 QUESTION #2 ANSWER



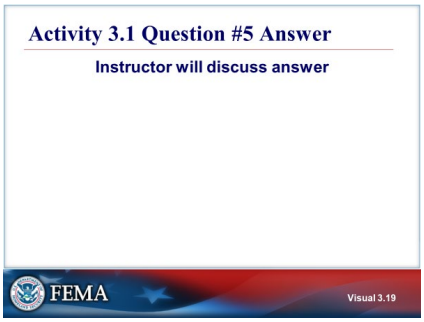
Visual 3.17

ACTIVITY 3.1 QUESTION #3 ANSWER



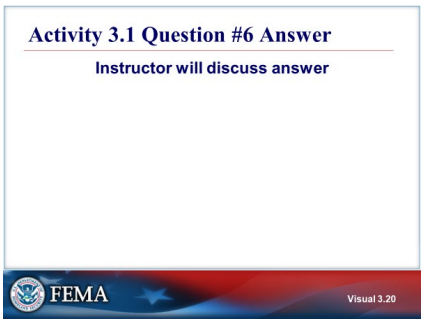
Visual 3.18

ACTIVITY 3.1 QUESTION #4 ANSWER



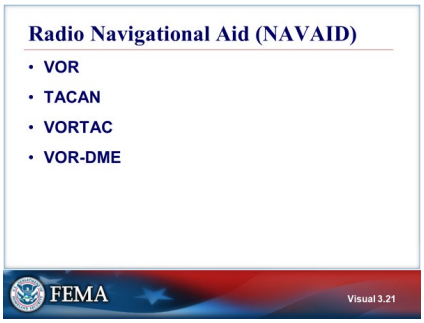
Visual 3.19

ACTIVITY 3.1 QUESTION #5 ANSWER



Visual 3.20

ACTIVITY 3.1 QUESTION #6 ANSWER



Visual 3.21

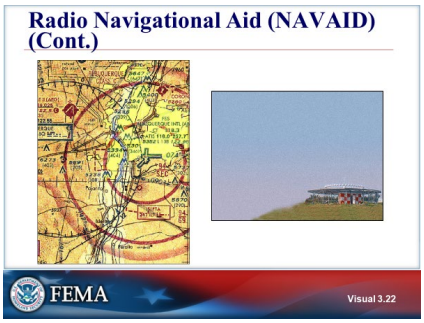
RADIO NAVIGATIONAL AID (NAVAID)

VHF omnidirectional radio range (VOR) is a type of short-range radio navigational system for aircraft that uses radio frequencies in the very high frequency (VHF) band. VOR enables aircraft to determine their position and stay on course by using a receiver unit to receive radio signals transmitted by a network of fixed ground-based radio beacons. VOR stations broadcast a VHF radio composite signal including the station's identifier, voice (if equipped), and the navigation signal. The navigation signal allows the airborne receiving equipment to determine a magnetic bearing from the station to the aircraft (the direction from the VOR station in relation to the Earth's magnetic North at the time of installation). VOR stations in areas of magnetic compass unreliability are oriented with respect to True North.

Tactical Air Navigation (TACAN) is an electronic navigation system used by military aircraft, which provides both distance and direction information.

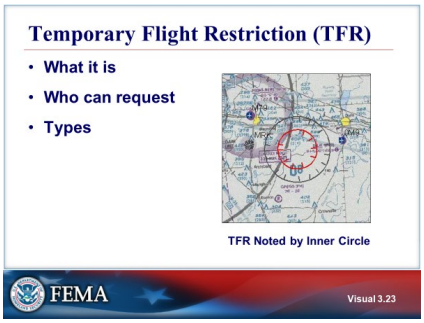
VORTAC is a facility that consists of both a VOR and a TACAN.

VOR-DME is a facility that consists of both a VOR and Distance Measuring Equipment (DME). DME is a transponder-based radio navigation technology that measures the distance of a plane from a land-based transponder.



Visual 3.22

RADIO NAVIGATIONAL AID (NAVAID (CONT.)



Visual 3.23

TEMPORARY FLIGHT RESTRICTIONS (TFR)

A Temporary Flight Restriction (TFR) is a regulatory action issued via the U.S. Notice to Airmen (NOTAM) system to restrict certain aircraft from operating within a defined area, on a temporary basis, to protect persons or property in the air or on the ground. Any NOTAM that implements a TFR should specify the reason for the flight restriction. The text of the actual TFR contains the fine points of the restriction.

A TFR may be requested by various entities including:

- Military commands
- Federal security/intelligence agencies
- Regional directors of the Office of Emergency Planning
- Emergency Management of Homeland Security Agency State Directors
- Civil authorities directing or coordinating organized relief air operations (e.g. Office of Emergency Planning)
- Law enforcement agencies
- U.S. Forest Service
- State aeronautical agencies
- State Governors
- FAA Flight Standards District Office
- Aviation event organizers
- Sporting event officials

The types of TFRs are defined in the following Sections of 14 CFR Part 91. The FAA issues TFRs following the regulations specified in these sections.

- Section 91.137, Temporary Flight Restrictions in the Vicinity of Disaster/Hazard Areas
    a) The Administrator will issue a Notice to Airmen (NOTAM) designating an area within which temporary flight restrictions apply and specifying the hazard or condition requiring their imposition, whenever he determines it is necessary in order to?

1) Protect persons and property on the surface or in the air from a hazard associated with an incident on the surface;
2) Provide a safe environment for the operation of disaster relief aircraft; or
3) Prevent an unsafe congestion of sightseeing and other aircraft above an incident or event which may generate a high degree of public interest. The Notice to Airmen will specify the hazard or condition that requires the imposition of temporary flight restrictions.

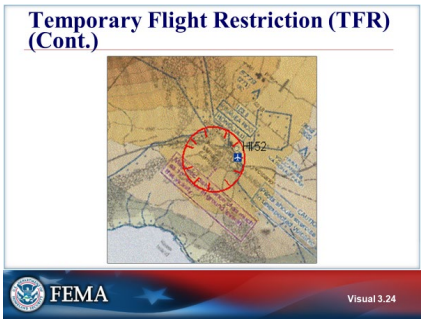
- Section 91.138, Temporary Flight Restrictions in National Disaster Areas in the State of Hawaii
- Section 91.139, Emergency Air Traffic Rules
- Section 91.141, Flight Restrictions in the Proximity of the Presidential and Other Parties
- Section 91.143, Flight Limitation in the Proximity of Space Flight Operations
- Section 91.145, Management of Aircraft Operations in the Vicinity of Aerial Demonstrations and Major Sporting Events
- Section 99.7, Special Security Instructions

The responsibility for screening requests for TFRs and subsequently granting or denying them, lies with the FAA's Office of System Operations Security.

Incident aircraft are almost always subject to the TFR restrictions, as well, and must be managed accordingly; however, law enforcement is often exempted in the regulation.

A NOTAM TFR issued under section 91.137 is effective for 90 days or until the national disaster area designation is terminated, whichever comes first.

Refer to Handout 3-2: Types of Temporary Flight Restrictions. Most important section for them will be Section 91.137(a)(2) and, perhaps, Section 91.137(a)(3).



Visual 3.24

TEMPORARY FLIGHT RESTRICTIONS (TFR) (CONT.)

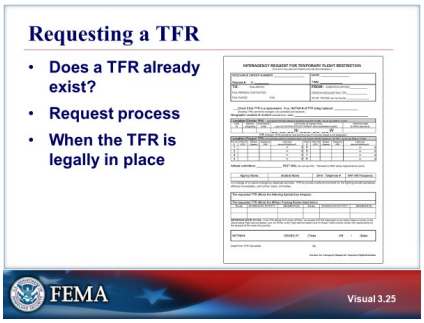
TFRs should be used when:

- Airspace is congested
- Multiple incidents are involved
- There is a need to restrict General Aviation aircraft from flying into the area and to regulate the access of media aircraft
- Military Training Routes (MTRs), Memoranda of Agreements (MOAs), or Special-Use Airspaces (SUAs) are involved
- In the interest of safety

Some TFRs that are basically permanent (e.g. over the White House, Disneyland). It is important to check to see if a TFR is already in existence. There are free online sources (e.g. SkyVector, Foreflight, AOPA) that allow you to see what TFRs are in place and provide additional information including the altitude and diameter of the TFR. You can also call 1-800-WX-BRIEF to get information on TFRs.

A typical TFR is a circle with a 5 mile radius and 5000 feet above the ground. However, TFRs are not always circles. They may be polygons or other shapes. They can also vary in heights. A good rule of thumb is to allow for 500 to 1000 feet above the altitude your incident aircraft are flying.

It is important to understand that TFRs cannot overlap. Each TFR is assigned a communication frequency and if there are two TFRs, there will be two frequencies. You will have to work with the other incident or agency that implemented the TFR.

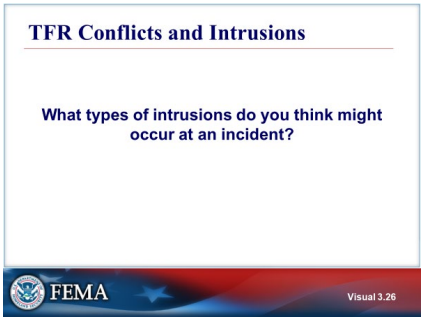


Visual 3.25

REQUESTING A TFR

All requests for TFRs should be routed through the local Dispatch who will notify the FAA of the need for a TFR based on the information supplied. You can call dispatch and give them the information from the form or complete the form and fax it to dispatch. Dispatch can determine the TFR if you supply the center point and radius you want.

Refer to Handout 3-3: Interagency Request for Temporary Flight Restriction.



Visual 3.26

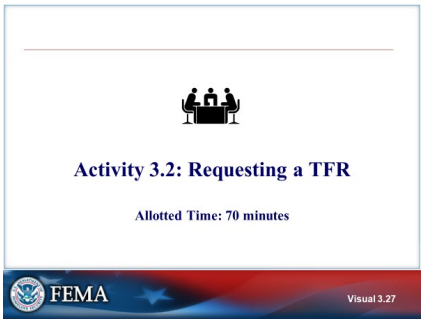
TFR CONFLICTS AND INTRUSIONS

Process for addressing TFR conflicts:

- Confirm with the FAA that local NOTAMs have been published.
- Visit the local dispatch office.
- Visit local Fixed-Base Operators.
- Visit the local military aircraft coordination center.
- Post their TFRs as maps or posters.
- Visit local aviation operators and vendors (float plane operations).
- Address U.S. Department of Homeland Security concerns.

Process for reporting an intrusion:

- Consult the FAA regarding possible administrative action.
- Document the intrusion using the agency's reporting system.
- Obtain witness statements.
- Obtain original signatures.
- Map the intrusion.
- Document the sequence of events.



Visual 3.27

ACTIVITY 3.2: REQUESTING A TFR

The instructor will explain Activity 3.1.

You will have 1 hour to complete the activity.

Visual 3.28

MANIFEST USDA STANDARD FORM 245 (6/77)

A flight manifest is a list of the crew and passengers and/or cargo parcels carried on an aircraft mission. A passenger manifest must be compiled before departure. All passengers on airplanes and helicopters will be manifested prior to the flight. A record of who is on board in case of an accident is critical.

- Airplane manifests are completed by Dispatch or by the Flight Manager.
- The Pilot-in-Command shall ensure that a manifest is completed whenever passengers are being transported.

The manifest includes:

- Passenger names
- Flight weight of each passenger
- Flight weight of cargo
- Pilot's name
- Destination

The primary purpose of a passenger manifest is to ensure that the incident commander and rescue personnel have prompt and adequate information in case of an aviation disaster. Manifesting cargo is important, especially if it is a hazardous material.

The weight of passengers and cargo is critical in determining the weight and balance of the aircraft. Crew weight is normally already included in the aircraft weight. The additional weight of passengers and cargo is used, along with the aircraft weight, in calculating the weight and balance of the aircraft prior to flight.

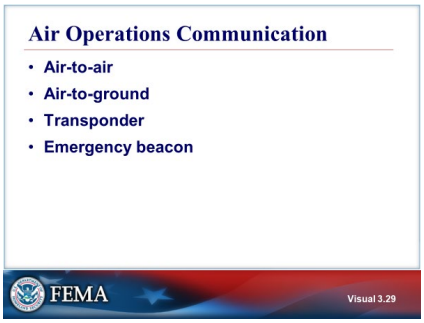
The excessive weight reduces the flight performance of the aircraft including:

- Higher takeoff speed
- Longer takeoff run
- Reduced rate and angle of climb
- Lower maximum altitude

- Reduced maneuverability
- Higher stalling speed

Passengers and cargo are loaded affects the center of gravity of the aircraft and thus, its balance. Adverse balance conditions affect flight characteristics in much the same manner as excess weight. In addition, there are two essential characteristics that may be seriously affected by improper balance: stability and control.

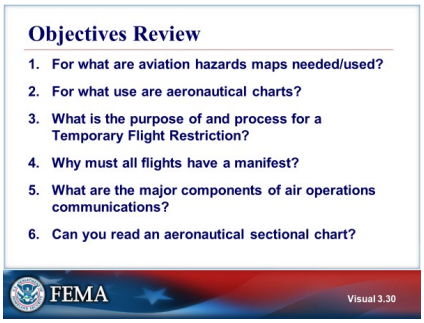
Refer to Handout 3-4: Example of a Manifest.



Visual 3.29

AIR OPERATIONS COMMUNICATION

- Air-to-air communication: Air-to-air communication is a means by which aircraft communicate with each other in flight. This is particularly important for collision avoidance during incidents where several aircraft are in the air at the same time in a limited airspace. It is important for the pilot to listen for other air traffic in the area, so air-to-ground communication should be limited to notification of hazards or other aircraft in the area.
- Air-to-ground communication: Air-to-ground communication is the means by which people on the ground and those in the air communicate with each other. A group of frequencies in the VHF radio spectrum are allocated to radio communication in civil aviation. Different sections of the band are used for radio NAVAIDs and air traffic control. Some channels are available only to users such as government agencies, search and rescue (SAR), and military aircraft.
- Transponder: Although not a verbal communication method, most planes carry a device known as a transponder. The transponder acts as an identification tool for aircraft allowing air traffic control centers/towers to immediately recognize the identity of each plane. They work by recognizing frequencies as they interact with the plane. Transponders can be used to avoid collisions with other aircraft and with the ground. Transponders also can be coded to identify incident aircraft. All contracted aircraft must have a transponder.
- Emergency locator beacons: Emergency locator beacons are tracking transmitters that aid in the detection and location of aircraft and aircrew in distress. They are radio beacons that interface with the international satellite system for SAR. When manually or automatically activated, the beacons send out a distress signal.



Visual 3.30

OBJECTIVES REVIEW

Unit Enabling Objectives

- Explain the need for and uses of aviation hazard maps.
- Describe the various uses for an aeronautical sectional chart.
- Describe the purpose of and process for implementation of Temporary Flight Restrictions (TFRs).
- Describe the purpose of a manifest.
- Define the major components of air operations communication.
- Demonstrate the ability to read an aeronautical sectional chart.

Supplemental Materials

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Handout 3-1: Latitude and Longitude Procedures

Refer to EL_987_ HO_3-1_Latitude_and_Longitude_Procedures.pdf

or

https://gacc.nifc.gov/swcc/dispatch_logistics/aviation/Other/SWA_lat_long_info.pdf

Activity 3.1: Determining Latitude and Longitude

Activity 3.1 — Unit 3

Purpose

The purpose of this activity is to help students gain familiarity with both determining the latitude and longitude of given objects and locations and identifying objects when given the latitude and longitude on an aeronautical sectional chart.

Objectives

Students will accomplish the following:

- Determine the latitude and longitude of the objects and locations identified in the activity on an aeronautical sectional chart.
- Locate and identify objects on an aeronautical sectional chart when given the latitude and longitude.

Activity Structure

This activity is scheduled to last approximately 35 minutes, including the individual activity and classroom discussion. After the instructor reads the directions aloud to the class, the students will work individually to determine the correct latitude/longitude for the given objects/locations, and to locate and identify the objects for the latitude and longitude provided on the worksheet.

Rules, Roles, and Responsibilities

The following are the specific activities / instructions for your participation in the activity:

1. Review the directions.
2. Using your group's Memphis aeronautical sectional chart, identify the objects located at the latitude and longitude provided by the instructor and record your answers in the space provided on the attached Activity 3.1 Questions sheet.
3. Using the group's aeronautical sectional chart, determine the latitude and longitude of the objects identified by the instructor and record your answers in the space provided on the Activity 3.1 Questions sheet.
4. Be prepared to share your answers with the rest of the class.

Activity 3.1 Schedule

Activity	Duration	Participation Type
Activity Introduction and Overview	5 minutes	Classroom
Activity	20 minutes	Individual
Review/Discussion	10 minutes	Classroom

Activity 3.1 Questions

1. What object is located at a latitude and longitude of 35° 8'N 93° 51'W?

2. What object is located at a latitude and longitude of 34° 18'N 89° 42'W?

3. What object is located at a latitude and longitude of 33° 05'N 90° 16'W?

4. What is the latitude and longitude of the refinery in the vicinity of ANNE MOA on the aeronautical sectional chart?

5. What is the latitude and longitude of Lawrence Glide port in the vicinity of Memphis on the aeronautical sectional chart?

6. What is the latitude and longitude of Pickensville tower in the vicinity of Columbus AFB on the aeronautical sectional chart?

Handout 3-2: Types of Temporary Flight Restrictions

14 CFR Sections 91.137-91.145

APPENDIX 1
SECTION 91.137 - TEMPORARY FLIGHT RESTRICTIONS IN THE VICINITY OF DISASTER/HAZARD AREAS

1. What is the purpose and use of a TFR issued under this section?

TFRs issued under this section address disaster/hazard situations and restrict flight operations within specified airspace, on a temporary basis, to provide protection of persons or property in the air or on the ground.

2. Who can issue a TFR under this section?

Except for hijacking situations, FAA Headquarters or the Directors of Terminal or En Route and Oceanic Area Operations (or their designee) having jurisdiction over the area concerned may issue a TFR under this section.

3. Who can issue a TFR for a hijacking situation?

The respective Directors of Terminal or En Route and Oceanic Area Operations (or their designee) having jurisdiction over the area of concern, in consultation with the Transportation Security Administration, will issue a TFR to address hijacking situations.

4. Who can request a TFR under this section?

A TFR may be requested by various entities, including military commands; regional directors of the Office of Emergency Planning; Civil Defense State Directors; civil authorities directing or coordinating air operations associated with disaster relief; civil authorities directing or coordinating organized relief air operations (including representatives of the Office of Emergency Planning, U.S. Forest Service, and state aeronautical agencies); and law enforcement agencies.

5. Are there any specifics that apply to each subparagraph of Section 91.137?

Yes, they are as follows:

1. **Section 91.137(a)(1).** Restrictions issued under this Section prohibit all aircraft from operating in the designated area unless that aircraft is participating in the disaster/hazard relief activities and is operated under the direction of the official in charge of on-scene emergency response activities.
2. **Section 91.137(a)(2).** Restrictions issued under this Section prohibit all aircraft from operating in the designated area unless at least one of the following conditions are met:
    1) The aircraft is participating in hazard relief activities and is operating under the direction of the official in charge of on-scene emergency response activities.
    2) The aircraft is carrying law enforcement officials.
    3) The aircraft is operating under an air traffic control (ATC) approved instrument flight rules (IFR) flight plan.

Note: ATC must coordinate with the official in charge of on-scene emergency response activities prior to allowing any IFR or visual flight rules (VFR) aircraft to enter into the TFR area.

4) The aircraft is operating directly to or from an airport within the area, or is necessitated by the impracticability of VFR flight above or around the area due to weather or terrain; the operation does not hamper or endanger relief activities and is not conducted for observing the disaster. Notification must be given to the ATC/Flight Service Station (FSS) facility specified in the NOTAM for coordination with the official in charge of on-scene emergency response activities.
5) The aircraft is carrying properly accredited news representatives, and before entering the area, a flight plan is filed with the ATC/FSS facility specified in the NOTAM, and the operation is conducted above the altitude used by the disaster relief aircraft, unless otherwise authorized by the official in charge of on-scene emergency response activities.

3. **Section 91.137(a)(3).** Restrictions issued under this Section prohibit all aircraft from operating in the designated area unless at least one of the following conditions are met:
   1) The aircraft is operating directly to or from an airport within the area, or is necessitated by the impracticability of VFR flight above or around the area due to weather or terrain, and the operation is not conducted for the purpose of observing the incident or event. Notification must be given to the ATC/FSS facility specified in the NOTAM for coordination with the official in charge of the activity.
   2) The aircraft is operating under an ATC approved IFR flight plan.
   3) The aircraft is carrying incident or event personnel, or law enforcement officials.
   4) The aircraft is carrying properly accredited news representatives and, before entering the area, a flight plan is filed with the appropriate FSS or ATC facility specified in the NOTAM.

6. What situations may warrant a TFR under this section?

Situations that may warrant a TFR under Section 91.137 include, but are not limited to the following:

a. 14 CFR Section 91.137(a)(1): toxic gas leaks or spills; fumes from flammable agents which, if fanned by rotor or propeller wash could endanger persons or property on the surface, or if entered by an aircraft could endanger persons or property in the air; volcanic eruptions that could endanger airborne aircraft and occupants; nuclear accident or incident; and hijackings.
b. 14 CFR Section 91.137(a)(2): aviation or ground resources engaged in wildfire suppression; and aircraft relief activities following a disaster (e.g. earthquake, tidal wave, flood, etc.).
c. 14 CFR Section 91.137(a)(3): disaster/hazard incidents of limited duration that would attract an unsafe congestion of sightseeing aircraft, such as aircraft accident sites.

7. What information should be included in flight plans and notifications made with an FSS or ATC facility when looking to operate within a TFR issued under this section?

The following information should be included in filed flight plans: aircraft identification, type, and color; radio communications frequencies to be used; proposed times of entry of, and exit from, the designated area; name of news media or organization and purpose of the flight; and, any other information requested by ATC.

APPENDIX 2
SECTION 91.138 - TEMPORARY FLIGHT RESTRICTIONS IN NATIONAL DISASTER AREAS IN THE STATE OF HAWAII

1. What is the purpose and use of a TFR issued under this section?

TFRs issued under this section address a determination that an inhabited area within a declared national disaster area in the State of Hawaii needs protection for humanitarian reasons.

2. Who can request a TFR under this section?

The Governor of the State of Hawaii, or the Governor's designee may request a TFR under this section.

3. What restrictions apply when TFRs are issued under this section?

The TFR will specify the extent and duration necessary to protect persons and property on the surface. Restrictions issued under this section prohibit all aircraft from operating in the designated area unless at least one of the following conditions are met:

a. Authorization is obtained from the official in charge of associated emergency or disaster relief response activities, and the aircraft is operated under the conditions of that authorization;
b. The aircraft is carrying law enforcement officials;
c. The aircraft is carrying persons involved in an emergency or a legitimate scientific purpose;
d. The aircraft is carrying properly accredited newspersons, and before entering the area, a flight plan is filed with the appropriate FAA or ATC facility specified in the NOTAM, and the operation is conducted in compliance with the conditions and restrictions established by the official in charge of on-scene emergency response activities; or,
e. The aircraft is operating in accordance with an ATC clearance or instruction.

4. For what length of time is a TFR effective under this section?

A NOTAM issued under this section is effective for 90 days or until the national disaster area designation is terminated, whichever comes first, or otherwise terminated by notice or extended at the request of the Governor of the State of Hawaii or the Governor's designee.

5. What office is responsible for issuing a TFR under this section?

The Airspace and Rules Manager, Office of System Operations and Safety, ATO-R can issue a TFR under this section.

APPENDIX 3
SECTION 91.141 - FLIGHT RESTRICTIONS IN THE PROXIMITY OF THE PRESIDENTIAL AND OTHER PARTIES

1. What is the purpose and use of a TFR issued under this section?

TFRs issued under this section address security with respect to airspace over presidential and other parties. Specifically, no person may operate an aircraft over or in the vicinity of any area to be visited or traveled by the President, the Vice President, or other public figures contrary to the restrictions established by the FAA and published in a NOTAM.

2. Who can request a TFR under this section?

This TFR may be requested by the Washington headquarters office of the U.S. Government agency responsible for the protection of the person concerned. This agency will contact FAA Headquarters in accordance with established procedures and request the necessary regulatory action.

3. What office is responsible for issuing a TFR under this section?

The ATO-R/Director of System Operations Security (or their designee) can issue a TFR under this section.

APPENDIX 4
SECTION 91.143 - FLIGHT LIMITATION IN THE PROXIMITY OF SPACE FLIGHT OPERATIONS

1. What is the purpose and use of a TFR issued under this section?

TFRs issued under this section address space flight operations. Specifically, no person may operate an aircraft of U.S. registry, or pilot an aircraft under the authority of an airman certificate issued by the FAA within areas designated in a NOTAM for space flight operations except when authorized by ATC, or the proponent for the flight operation.

2. Who can issue a TFR under this section?

FAA Headquarters or the Directors of Terminal or En Route and Oceanic Area Operations (or their designee) having control jurisdiction over the affected airspace can issue a TFR under this section.

APPENDIX 5
SECTION 91.145 – MANAGEMENT OF AIRCRAFT OPERATIONS IN THE VICINITY OF AERIAL DEMONSTRATIONS AND MAJOR SPORTING EVENTS

1. What situations warrant a TFR under this section?

Situations that may warrant a TFR under this section include, but are not limited to: military and civilian aerial demonstrations or major sporting events of limited duration to protect persons or property on the surface or in the air, to maintain air safety and efficiency, or to prevent the unsafe congestion of aircraft in the vicinity of an aerial demonstration or major sporting event.

2. What office is responsible for issuing a TFR under this section?

The Airspace and Rules Manager, Office of System Operations and Safety, ATO-R oversees all TFRs issued under this section.

3. When should the TFR request be sent in for processing?

A TFR request should be sent to the Airspace and Rules Manager, Office of System Operations and Safety, ATO-R at least 45 days in advance of an aerial demonstration or major sporting event.

4. Who can request a TFR under this section?

An aviation event organizer or participant may request a TFR under this section.

5. How do you request a TFR under this section?

a. ***For an aerial demonstration –*** The event organizer should submit two separate requests: (1) One to the Directors of Terminal or En Route and Oceanic Area Operations (or their designee) at least 45 days prior to the event; and (2) An application for a certificate of waiver or authorization (FAA Form 7711-2) for the restriction to the appropriate Flight Standards District Office, 90 days before the event for a civilian aerial demonstration and 120 days before the event for a military aerial demonstration.

b. ***For a major sporting event –*** The TFR request should be sent to the Directors of Terminal or En Route and Oceanic Area Operations (or their designee) at least 45 days in advance of the major sporting event. The Directors of Terminal or En Route and Oceanic Area Operations (or their designee) will assess the need for a TFR and forward their recommendation to the Airspace and Rules Manager, Office of System Operations and Safety, ATO-R. The Airspace and Rules Manager will determine whether a TFR is necessary and issue the TFR accordingly.

6. Who can operate in these areas?

Restrictions issued under this section prohibit the operation of any aircraft or device, or any activity within the designated airspace area except in accordance with the authorizations, terms, and conditions of the TFR published in the NOTAM, unless otherwise authorized by: (1) Air Traffic Control; or (2) A Certificate of Waiver or Authorization FAA Form 7711-1 issued for the aerial demonstration by Flight Standards.
Note: ATC must coordinate with the official responsible for the aerial demonstration prior to authorizing VFR or IFR aircraft to operate within the restricted airspace.

7. Can a TFR be requested for an event (or part of an event) that is outside of controlled airspace?

At times it may be necessary to issue restrictions to protect airspace not contained within controlled airspace. For an aerial demonstration, if any segment of the requested airspace is outside of controlled airspace, a restriction may be issued if the following criteria are met: (1) Military aircraft are conducting aerobatic demonstrations; (2) Civilian aircraft that operate in excess of 200 knots are conducting aerobatic demonstrations; and (3) Parachute demonstration teams are performing.
Note: Aerial demonstrations and sporting events occurring within Class B airspace areas may be handled through existing ATC procedures, without additional restrictions. However, each situation is unique and should be addressed as such.

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Handout 3-3: Interagency Request for Temporary Flight Restriction

INTERAGENCY REQUEST FOR TEMPORARY FLIGHT RESTRICTION

(This form may also be FAXed to provide documentation.)

RESOURCE ORDER NUMBER: _____ Request #: A -_____	DATE: _____ TIME: _____
TO: FAA ARTCC: FAA PERSON CONTACTED: FAA PHONE: FAX:	**FROM:** DISPATCH OFFICE:___ PERSON REQUESTING TFR:_____ 24 HR. PHONE (No Toll Free #s): _____

___Check if this TFR is a replacement. If so, NOTAM # of TFR being replaced: _____
(Existing TFRs cannot be changed, only cancelled and replaced.)

Geographic Location of Incident (nearest town, state): _____

Location (Circular TFR) List nearest NAVAID (distance should be less than 50 NM) - do not use NDB or T-VOR.

VOR ID	RADIAL (Degrees)	DISTANCE (NM)	LAT/LONG of Center Point (use US NOTAM OFFICE FORMAT ddmmssN/dddmmssW)	RADIUS (NM) (5 NM is standard)
			_ _ _ _ _ _N/ _ _ _ _ _ _ _W	

OR (Polygon TFRs should be rare and only use d if circular shape is not adequate.)

Location (Polygon TFR) (List perimeter points in clockwise order) List nearest NAVAID (distance < 50 NM) - do not use NDB or T-VOR.

Point #	VOR ID (XXX)	Radial (Degrees)	Distance (NM)	Lat/Long ddmmssN/dddmmssW	Point #	VOR ID (XXX)	Radial (Degrees)	Distance (NM)	Lat/Long ddmmssN/dddmmssW
1				N/ W	5				N/ W
2				N/ W	6				N/ W
3				N/ W	7				N/ W
4				N/ W	8				N/ W

Altitude restrictions: _____ FEET MSL (do not use AGL – Standard is 2000' above highest terrain point)

Agency Name:	Incident Name:	24-hr. Telephone #:	VHF-AM Frequency:

is in charge of on scene emergency response activities. TFR to provide a safe environment for firefighting aircraft operations; effective immediately, until further notice, 24 hrs./day.

The requested TFR affects the following Special-Use Airspace:

The requested TFR affects the Military Training Routes listed below:

Route	SCHEDULING ACTIVITY	SEGMENT(S)	Route	SCHEDULING ACTIVITY	SEGMENT(S)

IMPORTANT NOTE TO FAA: If the TFR affects SUA and/or MTR(s), we request NOTAM distribution to all military bases involved, to the Coordinating Flight Service Station, and, for MTRs, to the Flight Service Station and Air Route Traffic Control Center with responsibility for the airspace at the route entry point(s).

NOTAM # ISSUED AT (Time) ON / (Date)

Date/Time TFR Cancelled: By:

Activity 3.2: Requesting a TFR

Activity 3.2 — Unit 3

Purpose

The purpose of this activity is to help students identify and complete the steps required to construct and implement a Temporary Flight Restriction (TFR).

Objectives

Students will accomplish the following:

- Identify where they would search for existing TFR information
- Determine latitude/longitude using an aeronautical sectional chart based on the bearing and distance from a navigational aid
- Determine the size and altitude of the TFR, using the standard dimensions.
- Identify potential hazards in the area of the TFR
- Complete the attached FAA-approved form for requesting a TFR for the designated area.

Activity Structure

This activity is scheduled to last approximately 1 hour and 10 minutes, including small group discussion, presentation of group findings, and classroom discussion. The students will work in small groups for this activity. Instructors will hand out aeronautical sectional charts (one per group) and review the radials and distance from the chosen VHF omnidirectional range (VOR) for the TFR. The students will then do the following:

1. On an easel chart, list the steps to be taken to determine whether a TFR already exists.
2. Determine the latitude/longitude using the bearing and distance from the VOR provided in the activity to determine the originating point for the TFR.
3. Plot the TFR from the originating point using the standard area encompassed by a TFR or the area most affected by the incident.
4. Identify potential hazards in the TFR area and list them on an easel chart.
5. Complete the attached FAA form for requesting the TFR. (Handout 3-3)

Rules, Roles, and Responsibilities

The following are the specific activities / instructions for your participation in this activity:

1. Within your group, select a spokesperson.
2. On an easel chart, list the steps to be taken to determine whether a TFR already exists.
3. Using your group's aeronautical sectional chart, determine the latitude and longitude using the compass radial and distance from the VOR provided by the instructor to determine the originating point for the TFR.
4. Plot the TFR from the originating point using the standard area dimensions encompassed by a TFR.
5. On the easel chart, identify the potential hazards that may exist in the area, such as military training routes, power lines, a location between two airports indicating local traffic, etc.
6. Complete the request for a TFR using the attached form. (Handout 3-3)
7. Present your findings to the rest of the class and discuss them.

Instructors review the correct solution, moderate discussions, answer questions, and provide additional information as required.

Activity 3.2 Schedule

Activity	Duration	Participation Type
Activity Introduction and Overview	5 minutes	Classroom
Discussion / Activity	30 minutes	Small Groups
Presentations	20 minutes	Classroom
Debrief / Review	15 minutes	Classroom

Handout 3-4: Example of a Manifest

STANDARD FORM 245 (6-77) Prescribed by USDA FSM 5716 USDA MP9400.51B	PASSENGER AND CARGO MANIFEST	NO. OF PASSENGERS ON THIS PAGE _____	PAGE _OF

ORDERING UNIT	PROJECT NAME	PROJECT NO
NAME OF CARRIER	MODE OF TRANSPORTATION & ID. NO.	PILOT OR DRIVER
CHIEF OF PARTY	REPORT TO	IF DELAYED. CONTACT

DEPARTURE		INTERMEDIATE STOPS			DESTINATI	
PLACE	ETD	ETA	PLACE	ETD	ETA	PLA

PASSENGER AND OR CARGO NAME	M	F	PASSENGER WEIGHT	CARGO WEIGHT	DUTY ASGMT IF APPLICABLE	HOME UNIT
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						

SIGNATURE OF AUTHORIZED REPRESENTATIVE	DATE

Unit 4: Regulations and Policies Governing Air Operations

STUDENT MANUAL

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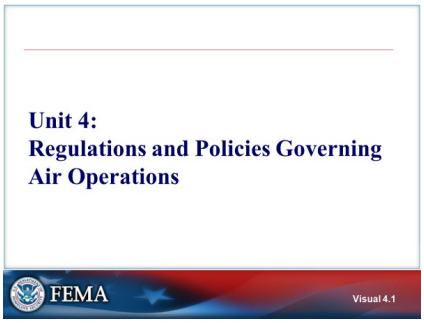


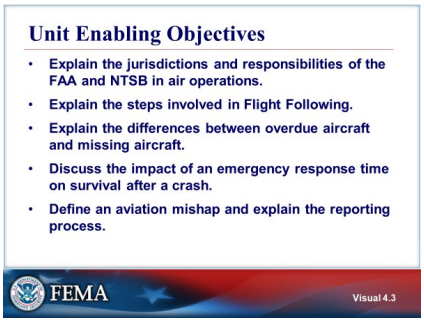
Visual 4.1

UNIT 4: REGULATIONS AND POLICIES GOVERNING AIR OPERATIONS

Visual 4.2

UNIT TERMINAL OBJECTIVE

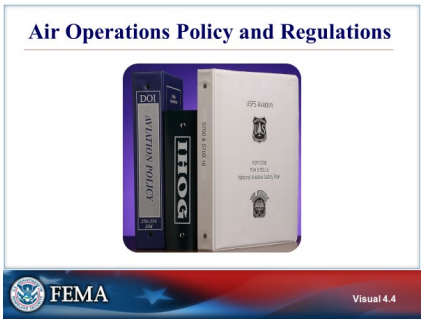
Identify and describe the various regulations and policies governing air operations.



Visual 4.3

UNIT ENABLING OBJECTIVES

- Explain the jurisdictions and responsibilities of the FAA and NTSB in air operations.
- Explain the steps involved in Flight Following.
- Explain the differences between overdue aircraft and missing aircraft.
- Discuss the impact of an emergency response time on survival after a crash.
- Define an aviation mishap and explain the reporting process.



Visual 4.4

AIR OPERATIONS POLICY AND REGULATIONS

Policies provide guidelines that help team members conduct aviation operations safely.
Policy is derived from the following documents:

- Agency handbooks, manuals, and guides
- Organization and position requirements
- Resource typing guides
- Contract requirements and national and regional aviation plans
- FAA policy regarding commercial operators under contract to government agencies

Interagency Aviation Training (IAT) A-107, Aviation Policy and Regulations I online training is an excellent resource for free information on aviation policy and regulations. It can be accessed at https://www.iat.gov/training/searchcourse.asp

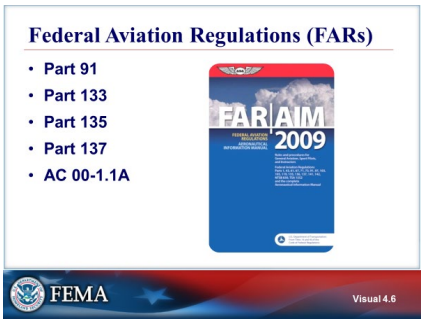
Visual 4.5

FEDERAL AGENCIES INTERACTING WITH AIR OPERATIONS

The Federal Aviation Administration (FAA) is an agency of the U.S. Department of Transportation. It has the authority to regulate and oversee all aspects of U.S. civil aviation. The FAA's roles include, but are not limited to:

- Regulating the national airspace including air navigation facilities' geometry and flight inspection standards
- Issuing, suspending, or revoking pilot certificates
- Regulating civil aviation to promote safety, especially through local offices called Flight Standards District Offices
- Developing and operating a system of air traffic control and navigation for both civil and military aircraft

The National Transportation Safety Board (NTSB) is the Federal agency responsible for investigating civil transportation accidents and the primary agency investigating every civil aviation accident in the U.S. The FAA is always a party to these investigations; however, the NTSB is the investigating agency.



Visual 4.6

FEDERAL AVIATION REGULATIONS (FARS)

Federal Aviation Regulations (FARs) 14 CFR:

- Part 91 – General Operating and Flight Rules
- Part 133 – External Load Operations
- Part 135 – Aircraft for Hire
- Part 137 – Agricultural Aircraft Operations
- AC 00-1.1A – Public Aircraft Operations

Visual 4.7

LEGAL AND SAFETY REQUIREMENTS

Several guidelines for safety requirements relevant to heliport/helibase operations are available and include:

- FAA Advisory Circular (AC) 150/5390-2B provides guidance regarding heliport/helispot set up and operations. Although noncompulsory by regulation, this AC provides excellent guidance in setting up and operating heliports.
- The National Fire Protection Association (NFPA) also publishes an excellent guide, NFPA 418: Standard for Heliports, which can be used to ensure safe operations in and around ground-level heliports.
- The Interagency Helicopter Operations Guide (IHOG), Chapter 8, also provides excellent guidance in setting up, maintaining, and operating a helibase/heliport.

Compliance with the following regulatory requirements must be ensured with regard to flight operations (aircraft and pilot requirements):

- Applicable Federal Aviation Regulations (FARs)
  - 14 CFR Parts 43, 61, 91, 133, and 135, where applicable
- Public Aircraft Rules as they pertain to aircraft owned and operated by a government agency and civilian aircraft under government contract.
  - 14 CFR Chapter 1 provides FAA policy on civil aircraft operators providing contract support to government agencies. This policy was recently enacted and must be reviewed and held in compliance by all personnel assigned to the Air Operations Branch, which has oversight of maintenance activities and helibase operations.

Visual 4.8

AIRCRAFT AND PILOT REQUIREMENTS

Aircraft used and pilots employed by government agencies for all-hazard incidents must:

- Meet FAA aircraft safety and pilot qualification requirements.
  - The pending changes to FEMA's Position Description for most pilot positions related to non-fire, all-hazards incidents are as follows:
    - Type I Aircraft: Commercial Pilot, Airline Transport (ATP), Instrument Rated or military equivalent
    - Type II Aircraft: Commercial Pilot, Instrument Rated or military equivalent
    - Type III and IV Aircraft: Commercial Pilot (Fixed-Wing Instrument Rated) or military equivalent
    - Qualified and current in the category, type, and model of the aircraft being flown
  - At a minimum, all pilots must have a current FAA Class II Medical Certificate
- Meet specific government agency requirements (e.g. aircraft inspection and pilot proficiency training, flight hours, physical requirements).

Visual 4.9

INTERACTING WITH OTHER AGENCIES

- Military/National Guard – May be used for Search and Rescue (SAR) and delivering needed supplies to the affected area.
- Hospital-based/private medical helicopters - May be used to transfer patients from hospitals, nursing homes, or assisted living areas affected by the incident.
- Media helicopters – These are not used for incident operations, but will be aircraft that will attempt to gain access to the incident for news broadcasts.
- Private companies with Unmanned Aircraft Systems (UASs)– These are becoming more and more common with the news media as well as private companies that are available for surveying.

Visual 4.10

MILITARY SUPPORT

Military aircraft can provide support during an incident. However, there are some fundamental differences in the operating policies and procedures between the agencies and military services. When assigned to an agency/incident, the military maintains administrative control of their aircraft and operates under their own internal policies. This is true regardless of their status (e.g. State Active Duty, Title 32, or Title 10).

Under normal circumstances, if the National Guard is called upon to assist in the event of a natural disaster or civil disorder that IS NOT a wildland fire incident, the laws of their State or Terrritory will govern their deployment and control. The status of the National Guard in these instances is predicated on how they are being funded.

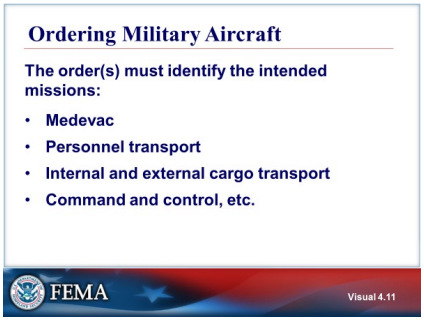
- If they are being funded entirely by their State, their status is normally State Active Duty paid for with the State budget. This is the most common status for National Guard support of Domestic Response.
- In some special circumstances such as when a Federal disaster has been declared and the Federal Government is providing financial assistance to the State in response to the event, the National Guard could be activated under Title 32 USC, which is federally funded, but is still under State/ Territory control. This is less common than State Active Duty.
- If the National Guard is federally activated, they are no longer under State control and are operating under Title 10 USC, the same laws that govern active and reserve military units.

Although the State laws governing the use of the National Guard may differ slightly from State-to-State, the laws governing deployment under Title 32 or Title 10 are all the same.

the provisions for financial reimbursement are slightly different under Title 32 and Title 10. Under Title 32, additional reimbursement to the State/Territory may or may not come from the Federal government (States/Territories are funded annually for their normal Title 32 activities to support unit training, readiness and

select domestic support activities). Under Title 10, the Federal government does control the money, so the military is reimbursed at their regular active duty rates. Title 10 is much more restrictive on the use of military aircraft. They cannot do law enforcement solely, but they can assist. Typically in a disaster, everyone is Title 32.

Operationally, military aircraft are assigned to the incident and receive missions through the Air Operations Branch Director (AOBD) or his/her staff; however, once in receipt of the mission, the military assigns the aircraft and crew most suited for the particular mission.

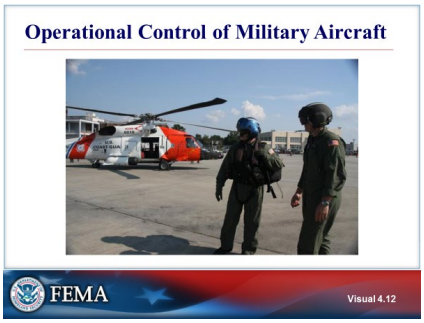


Visual 4.11

ORDERING MILITARY AIRCRAFT

Civilian aircraft, if available, should be used for all incident needs. Even when military battalions are assigned to incidents, civilian aircraft under government contract may be used for reconnaissance, command and control, and personnel transport of the military.

Requesting military units, specifically the National Guard, is done through the local agency (normally the sheriff) or the governing authority (city/county) affected by the incident. The request is submitted to the Governor of the affected State through the State Office of Emergency Management or some similarly titled office (they may differ from State to State).



Visual 4.12

OPERATIONAL CONTROL OF MILITARY AIRCRAFT

When the Active or Reserve military components are activated, agency policies and procedures will generally govern aviation operations for all incidents. When assigned to an incident, all military aircraft will be under the operational control of the incident Air Operations Branch. This means that the Incident or Area Commander to whom the military aircraft are assigned has the authority to direct and control the missions and tasks assigned to these aircraft.

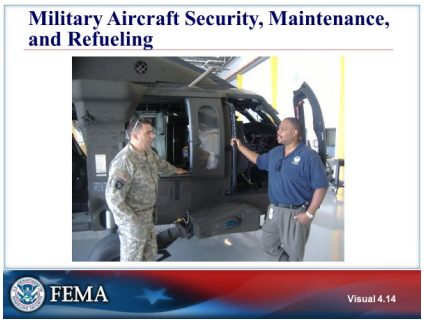
Once military aviation assets are assigned to the incident and the approved mission designation has been identified, there will be no delineation between the use of military aircraft or civilian aircraft. The most suitable aircraft for a mission shall be used, regardless of ownership. Military assets should be assigned to the incident to integrate their personnel into the incident and helibase organizations.

Visual 4.13

INCORPORATING MILITARY SUPPORT

When the military provides incident support, it should be incorporated into the incident command structure:

- **Incident Command Structure:** The assigned military Officer in Charge (OIC) is kept appraised of all incident activity and is part of the Incident Command Structure relative to military activities. A military liaison officer is normally assigned to the Incident Commander (IC) and AOBD.
- **Planning:** The military OIC is involved in all aspects of planning that will involve military assets, specifically aviation support.
- **Briefings:** The military OIC or the OIC's representative will participate in all briefings and debriefings.
- **Operations:** Operations involving military assets shall be considered with input from the military liaison and/or the OIC.
- **Oversight and Management**: The military shall operate within their own chain of command. However, it is understood that the military is assigned to assist civilian authorities and all mission assignments will come from the IC.
- **Debriefings:** The military OIC shall participate in all formal debriefings and after-action meetings.



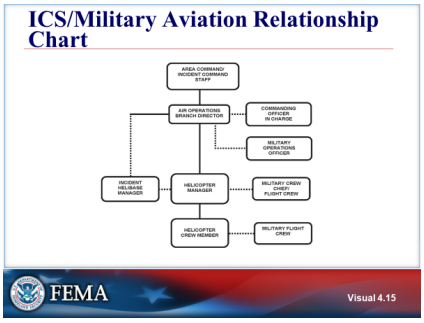
Visual 4.14

MILITARY AIRCRAFT SECURITY, MAINTENANCE, AND REFUELING

Security**:** The military is responsible for the security of all military aircraft and support equipment provided for the incident.

Maintenance**:** When military aircraft are activated, it will be necessary to accommodate their maintenance group. The civilian agencies assist with selecting and obtaining a suitable area and facilities for maintenance. A request through military command may be necessary for additional military aircraft maintenance support. To meet military logistical needs, it may be best to station military aircraft at or near an airport where aircraft parts and equipment can be readily delivered.

Refueling**:** Military aircraft use J-8 or Jet A fuel. The military can purchase fuel by credit card from any commercial source or obtain fuel from local military sources. Military helicopters require the fuel additive PRIST when using Jet A fuel. Ensure that the fuel source contains PRIST. If it doesn't, arrangements should be made for this additive to be made available. PRIST is generally available through commercial fuel vendors.



Visual 4.15

ICS/MILITARY AVIATION RELATIONSHIP CHART

The ICS/Military Aviation Relationship Chart provides a visual demonstration of the relationship among the positions responsible for coordinating military support.

Refer to Handout 4-1: ICS/Military Aviation Relationship Chart.

Visual 4.16

HOSPITAL-BASED/PRIVATE MEDICAL HELICOPTERS

Air medical assets (helicopters with crews) may be contracted by FEMA and activated to assist in the evacuation of hospitals, nursing homes, and patients with significant medical problems who are living at home. FEMA contracted and activated the American Medical Response medical helicopters in this picture when Hurricane Dean appeared to be threatening South Texas in 2007.

Determining what hospital receives patients and how many depend on:

- The level of service they can provide (e.g. Level I trauma center has staff physicians and surgery staff around the clock)
- Bed capacity for admitting patients
- Number of operating rooms available

All hospitals have their own disaster plans and medical helicopters based at those hospitals will know what those plans are. Hospital capabilities should be a part of the Medical Plan, but it is important to ensure that pilots of helicopters used for medical transport responding to an incident in a region they are unfamiliar with also know this information.

Visual 4.17

MEDIA AIRCRAFT

Media is extremely persistent in trying to gain access to sites for the “public’s right to know.” When the media have helicopters available, they will attempt to fly over incident sites to get films that everyone wants to see on the news. This sets up the potential for serious safety hazards and conflicted airspace.

Media helicopters operating in large metropolitan areas are accustomed to operating in close proximity to first responder aircraft and, for the most part, understand that they need to provide adequate separation to allow responders to do their jobs. In most cases, all aircraft operating over an incident site are utilizing a common air-to-air frequency that is consistent with that geographical area or region. Media aircraft are also accustomed to operating under Temporary Flight Restrictions (TFRs).

Outside of major metropolitan areas, this level of cooperation may not be the case. In these situations, it is best to meet with the media pilots, establish some operational guidelines, and ensure that media aircraft do not interfere with responders.

Taking the necessary steps to de-conflict the airspace and eliminate the hazard of uncontrolled aircraft in the incident airspace is critical. This may require requesting a TFR. Ongoing monitoring will be required and the appropriate steps must be taken if intrusions occur.

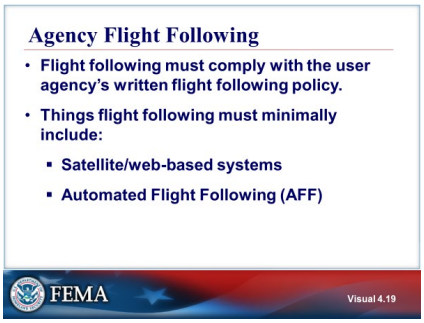
Visual 4.18

PRIVATELY OWNED UNMANNED AIRCRAFT SYSTEMS

There are two types of Unmanned Aircraft Systems (UASs), commonly known as Unmanned Aerial Vehicles (UAVs) or drones, that you should be aware of.

These are:

- High altitude
  - Fly above 18,000 feet
  - Used for wide level information gathering
  - Do not affect incident air operations
  - Most familiar example is the Predator
- Tactical reconnaissance
  - Hand-held and launched
  - Being used more and more by news media
  - Used by private companies to conduct surveys for profit



Visual 4.19

AGENCY FLIGHT FOLLOWING

Flight Following must comply with the operational agency's written flight following policy. If a flight following policy is not in place, the incident's AOBD may have to establish a policy for flight following of all aircraft involved in the operation:

- Radio contact will be made at predetermined intervals. Most agencies use intervals of less than 1 hour (e.g. 15 to 30 minutes). Crews must go no longer than 1 hour without contact.
- Position reports or updates are communicated and recorded.
- Personnel must be assigned to monitor the communications radio at all times during the flight.

1. Flight Following must minimally include:
    - Aircraft type and identification ("N" number)
    - Aircraft color
    - Pilot name(s)
    - Fuel on board (e.g. 2 hours of fuel)
    - Passenger name(s)
    - Passenger and cargo weights
    - Nature of mission
    - Flight routes and points of departure and destination
    - Estimated duration of mission
    - Estimated time of departure
    - Estimated time of arrival (ETA)
    - Check-in procedures
2. If an aircraft is equipped with the satellite/Web-based system for Automated Flight Following (AFF), the dispatcher can monitor the aircraft's location on a computer screen. AFF provides the dispatcher with near real-time information regarding the aircraft's latitude and longitude, heading, airspeed, altitude, and flight history.

Visual 4.20

3. AFF:
    - Reduces the requirement to check in via radio every 15 minutes
    - Reduces pilot workload
    - Clears congested radio frequencies
    - Provides the dispatcher with much greater detail and accuracy regarding aircraft location.
4. AFF is an approved method for agency flight following. Most U.S. Forest Service Agency aircraft have AFF capability.

OVERDUE AND MISSING AIRCRAFT

An aircraft is considered "overdue" when:

- The pilot fails to check in (radio, telephone, or AFF) within the timeframe specified in the agency's flight following request

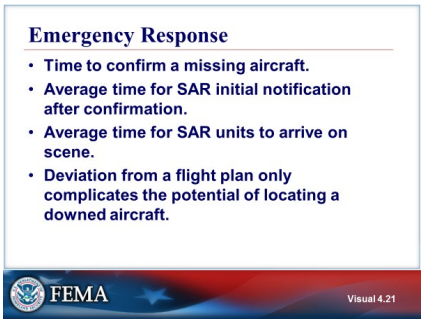
  OR

- When operating on an FAA (VFR) flight plan, fails to arrive within 30 minutes past the ETA, and its location cannot be established

An aircraft is officially "missing" when the aircraft's known fuel duration, as reported on its request for flight following or as reported on its FAA flight plan, has been exceeded and the aircraft's location is not known.

Overdue and missing aircraft must be reported orally to a supervisor, dispatcher, or aviation manager immediately and to the NTSB according to the requirements in 49 CFR 830 NTSB.

Refer to Handout 4-2: NTSB Requirements for Reporting Aircraft Accidents, Incidents, and Overdue Aircraft.

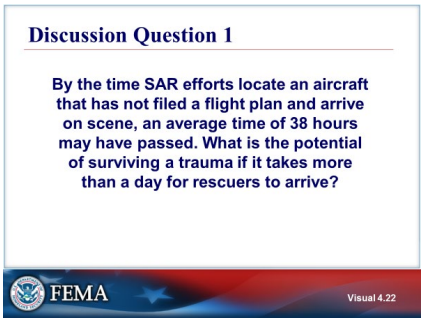


Visual 4.21

EMERGENCY RESPONSE

Filing a written flight plan and flight following dramatically decrease the response time for SAR efforts. However, it may still require more than 5 hours for individuals to check and confirm that there is a missing aircraft.

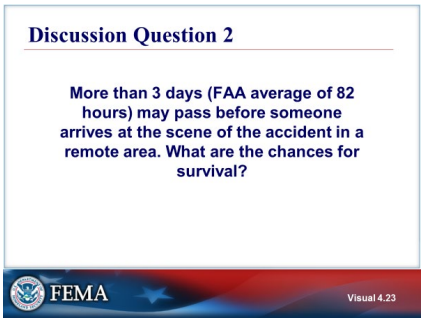
- The average time for SAR initial notification is about 30 minutes after an aircraft is determined to be overdue or missing:
- The average time for SAR units to arrive on scene is about 4 hours.



Visual 4.22

DISCUSSION QUESTION 1

By the time SAR efforts locate an aircraft that has not filed a flight plan and arrive on scene, an average time of 38 hours may have passed. What is the potential for surviving a trauma if it takes more than a day for rescuers to arrive?

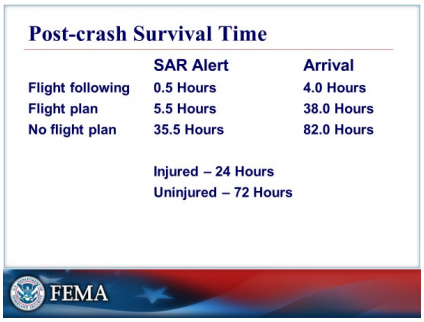


Visual 4.23

DISCUSSION QUESTION 2

More than 3 days (the FAA average is 82 hours) may pass before someone arrives at the scene of an accident in a remote area.

What are the chances for survival?



Visual 4.24

POST-CRASH SURVIVAL TIMES

The crew and passengers should always consider the environment in which they will be flying. Even on routine flights, they should remember to bring clothing and/or supplies commensurate with conditions in the area should they have a mishap. They should know what their agency's policy is regarding supplemental survival equipment.

Visual 4.25

AVIATION MISHAPS

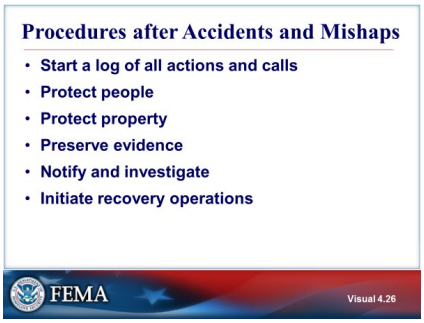
Aircraft accident: An occurrence associated with the operation of an aircraft, which takes place between the time any person boards the aircraft with the intention of flight and the time that all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.

Example: An airplane crash with serious injuries or fatalities.

Aircraft incident: An occurrence, other than an accident, associated with the operation of an aircraft that affects, or could affect, the safety of operations or the mission. Some examples are as follows:

- Failure to file a flight plan or flight following
- Precautionary landing: a landing necessitated by apparent impending failure of engines, systems, or components, which makes continued flight inadvisable
- Aircraft ground mishap: a mishap in which there is no intent to fly; however, the power plants and/or rotors are in operation and damage incurred requires replacement or repair of rotors, propellers, wheels, tires, wing tips, flaps, etc., or an injury occurred that requires first aid or other medical attention
- Near mid-air collision: an airborne aircraft encroaches within 500 feet of another aircraft
- Occurrences that affect or could affect safety
- Aviation hazards
- Aircraft maintenance deficiencies: any serious defect or failure causing mechanical difficulties
- Overdue aircraft
- Missing aircraft

Refer to the Interagency Mishap Response Guide when needing guidance in managing an overdue or missing aircraft.



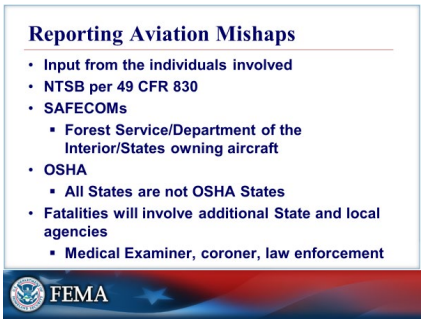
Visual 4.26

PROCEDURES AFTER ACCIDENTS AND MISHAPS

As soon as you are aware of an accident or mishap, the following steps should be taken:

- Start a log of all actions and calls.
- Protect people. Life-saving operations take first priority.
- Protect property. Property should be protected from unnecessary additional damage.
- Preserve evidence. Treat the area as if it were a crime scene and provide 24-hour security until the investigation team arrives. Identify witnesses and obtain their addresses and phone numbers.
- Notify and investigate. Report the accident using your organization's chain-of-command and policies. Do not delay reporting the event if detailed information is not immediately available.
- Initiate recovery operations. Actual recovery is usually the responsibility of the owner; always check with the appropriate Contracting Officer.

Never say the N number of the aircraft involved over the radio. This is equivalent to giving anyone listening the names of those aboard the aircraft.



Visual 4.27

REPORTING AVIATION MISHAPS

The requirements for reporting aviation mishaps vary by agency. The requirements outlined in 49 CFR 830 have been discussed earlier. Aviation Safety Communiqués (SAFECOMs) are used only by the U.S. Forest Service (FS), the U.S. Department of the Interior (DOI), and States that own aircraft.

States that own aircraft have their own SAFECOM manager for follow-up and are part of the national system. There will be no follow-up if a SAFECOM is submitted as directed by any agency other than those identified above.

Reporting mishaps is used to track trends and eliminate potential problems, make changes in training and policy, and ensure safer aircraft. To be effective, this relies on:

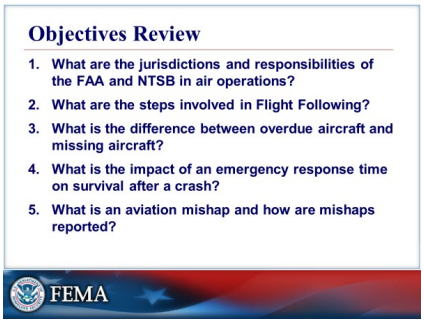
- Input from the individuals involved
- Posting Alerts and SAFECOMs
- Reports and documentation
- Promoting an environment where reporting is encouraged

Visual 4.28

ACTIVITY 4.1: IDENTIFY ACCIDENT RESPONSE STEPS

The instructor will explain Activity 4.1.

You will have 30 minutes to complete the activity.



Visual 4.29

OBJECTIVES REVIEW

Unit Enabling Objectives

- Explain the jurisdictions and responsibilities of the FAA and NTSB in air operations.
- Explain the steps involved in Flight Following.
- Explain the difference between overdue aircraft and missing aircraft.
- Discuss the impact of an emergency response time on survival after a crash.
- Define an aviation mishap and explain the reporting process.

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Supplemental Materials

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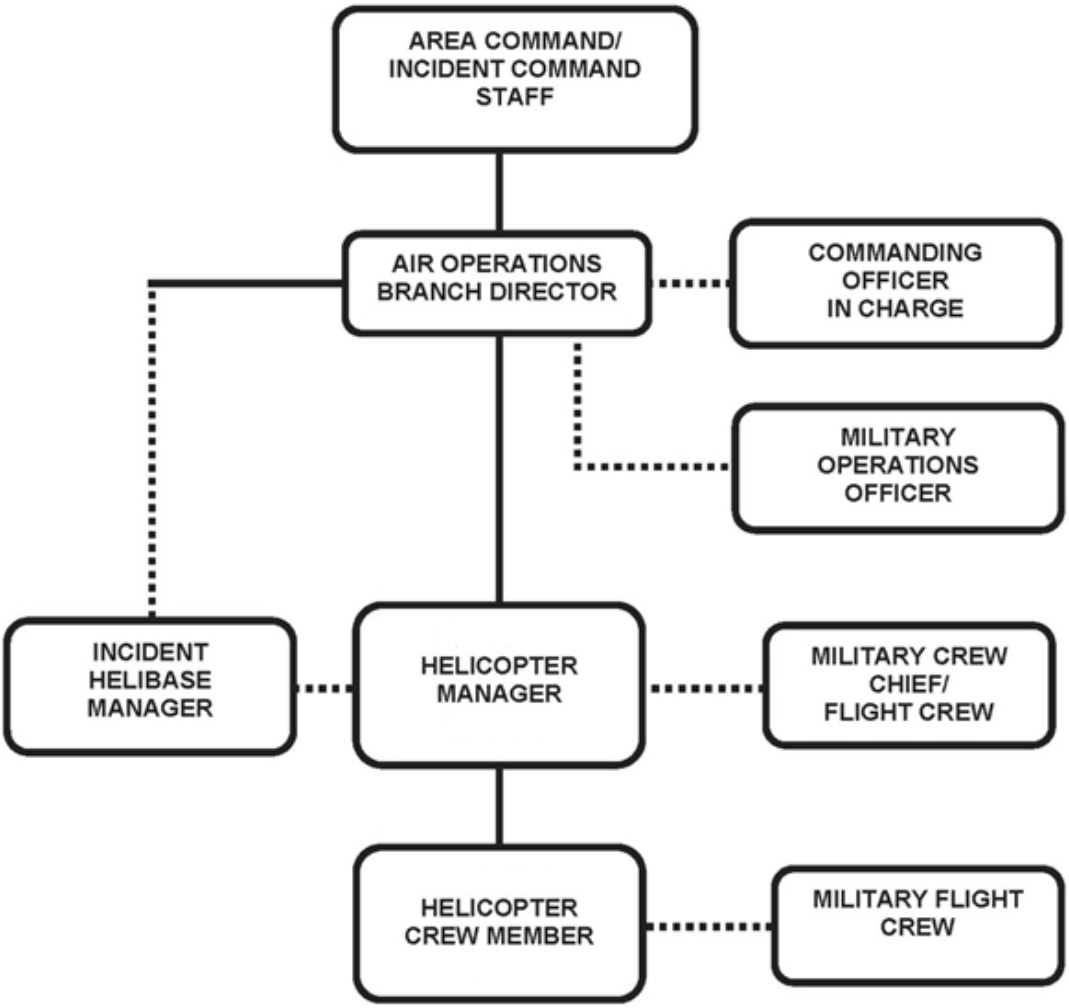
Handout 4-1: ICS/Military Aviation Relationship Chart



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Handout 4-2: NTSB Requirements for Reporting Aircraft Accidents, Incidents, and Overdue Aircraft

49 CFR 830 NTSB

Subpart B—Initial Notification of Aircraft Accidents, Incidents, and Overdue Aircraft

Contents

The operator of any civil aircraft, or any public aircraft not operated by the Armed Forces or an intelligence agency of the United States, or any foreign aircraft shall immediately, and by the most expeditious means available, notify the nearest National Transportation Safety Board (NTSB) office when:

NTSB regional offices are located in the following cities: Anchorage, Alaska; Atlanta, Georgia; West Chicago, Illinois; Denver, Colorado; Arlington, Texas; Gardena (Los Angeles), California; Miami, Florida; Seattle, Washington; and Ashburn, Virginia. In addition, NTSB headquarters is located at 490 L'Enfant Plaza, SW., Washington, DC 20594. Contact information for these offices is available at *http://www.ntsb.gov*.

(a) An aircraft accident or any of the following listed serious incidents occur:

(1) Flight control system malfunction or failure;

(2) Inability of any required flight crewmember to perform normal flight duties as a result of injury or illness;

(3) Failure of any internal turbine engine component that results in the escape of debris other than out the exhaust path;

(4) In-flight fire;

(5) Aircraft collision in flight;

(6) Damage to property, other than the aircraft, estimated to exceed $25,000 for repair (including materials and labor) or fair market value in the event of total loss, whichever is less.

(7) For large multiengine aircraft (more than 12,500 pounds maximum certificated takeoff weight):

(i) In-flight failure of electrical systems which requires the sustained use of an emergency bus powered by a back-up source such as a battery, auxiliary power unit, or air-driven generator to retain flight control or essential instruments;

(ii) In-flight failure of hydraulic systems that results in sustained reliance on the sole remaining hydraulic or mechanical system for movement of flight control surfaces;

(iii) Sustained loss of the power or thrust produced by two or more engines; and

(iv) An evacuation of an aircraft in which an emergency egress system is used.

(8) Release of all or a portion of a propeller blade from an aircraft, excluding release caused solely by ground contact;

(9) A complete loss of information, excluding flickering, from more than 50 percent of an aircraft's cockpit displays known as:

(i) Electronic Flight Instrument System (EFIS) displays;

(ii) Engine Indication and Crew Alerting System (EICAS) displays;

(iii) Electronic Centralized Aircraft Monitor (ECAM) displays; or

(iv) Other displays of this type, which generally include a primary flight display (PFD), primary navigation display (PND), and other integrated displays;

(10) Airborne Collision and Avoidance System (ACAS) resolution advisories issued either:

(i) When an aircraft is being operated on an instrument flight rules flight plan and compliance with the advisory is necessary to avert a substantial risk of collision between two or more aircraft; or

(ii) To an aircraft operating in class A airspace.

(11) Damage to helicopter tail or main rotor blades, including ground damage, that requires major repair or replacement of the blade(s);

(12) Any event in which an operator, when operating an airplane as an air carrier at a public-use airport on land:

(i) Lands or departs on a taxiway, incorrect runway, or other area not designed as a runway; or

(ii) Experiences a runway incursion that requires the operator or the crew of another aircraft or vehicle to take immediate corrective action to avoid a collision.

(iii) An aircraft is overdue and is believed to have been involved in an accident.

[53 FR 36982, Sept. 23, 1988, as amended at 60 FR 40113, Aug. 7, 1995; 75 FR 927, Jan. 7, 2010; 75 FR 35330, June 22, 2010]

§ 830.6 Information to be given in notification.

The notification required in § 830.5 shall contain the following information, if available:

(a) Type, nationality, and registration marks of the aircraft;

(b) Name of owner, and operator of the aircraft;

(c) Name of the pilot-in-command;

(d) Date and time of the accident;

(e) Last point of departure and point of intended landing of the aircraft;

(f) Position of the aircraft with reference to some easily defined geographical point;

(g) Number of persons aboard, number killed, and number seriously injured;

(h) Nature of the accident, the weather and the extent of damage to the aircraft, so far as is known; and

(i) A description of any explosives, radioactive materials, or other dangerous articles carried.

Subpart D—Reporting of Aircraft Accidents, Incidents, and Overdue Aircraft

Contents

§ 830.15 Reports and statements to be filed.

(a) *Reports.* The operator of a civil, public (as specified in § 830.5), or foreign aircraft shall file a report on Board Form 6120. ½ (OMB No. 3147-0001) within 10 days after an accident, or after 7 days if an overdue aircraft is still missing. A report on an incident for which immediate notification is required by § 830.5(a) shall be filed only as requested by an authorized representative of the Board.

[2] Forms are available from the Board field offices, from Board headquarters in Washington, DC, and from the Federal Aviation Administration Flight Standards District Offices.

(b) *Crewmember statement.* Each crewmember, if physically able at the time the report is submitted, shall attach a statement setting forth the facts, conditions, and circumstances relating to the accident or incident as they appear to him. If the crewmember is incapacitated, he shall submit the statement as soon as he is physically able.

(c) *Where to file the reports.* The operator of an aircraft shall file any report with the field office of the Board nearest the accident or incident.

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Activity 4.1: Identify Accident Response Steps

Activity 4.1 — Unit 4

Purpose

The purpose of this activity is to help students understand how accidents and mishaps that may occur during an incident should be handled.

Objectives

Students will accomplish the following:

- Identify, based on a scenario, what steps should be taken in response.
- Discuss how the reporting process would take place.

Activity Structure

This activity is scheduled to last approximately 30 minutes, including small group discussion, presentation of group findings, and classroom discussion. After reviewing the mishap, the students will break into their groups and discuss what steps should be taken in response and how the reporting process should occur. The class will reassemble and discuss their findings.

Rules, Roles, and Responsibilities

The following are the specific activities / instructions for your participation in this activity:

1. Review the activity scenario.
2. Within your small group, identify what steps should be taken in response.
3. Be prepared to present your findings and discuss them with the rest of the class.

Instructors moderate discussions, answer questions and provide additional information as required.

Activity 4.1 Schedule

Activity	Duration	Participation Type
Activity Introduction and Overview	5 minutes	Classroom
Activity	10 minutes	Small Groups
Debrief / Review	15 minutes	Classroom

Activity 4.1 Scenario

One of the CWN 412 helicopters and crew have been assigned the mission of transporting via external load a pallet of food and water to a remote location isolated from roads due to storm damage. The aircrew and ground crew have been briefed on the mission. The aircraft is capable of lifting the load using a 100 foot long line and all preparations have been made to secure the 3870 lb. load. While the helicopter is parked on the ground with the engines running and rotors turning a safe distance away from the load, the loadmaster secures the grommet attached to the cables on the pallet to the remote cargo hook attached at the end of the helicopter long line. He signals to the ground guide to advise the aircraft that they can position themselves over the load. Once the helicopter lifts off and hovers over the load, the ground guide signals to the pilot that the load is hooked and they are cleared for departure. As the helicopter begins to climb and slowly moves forward through lift-off, the remote cargo hook opens prematurely and the pallet of food and water falls to the ground from a height of approximately 50 feet. The pallet falling to the ground causes load containers and pallet debris to be scattered over a wide area, some of it striking and injuring three persons on the ground, one seriously. The aircraft lands a safe distance away without incident.

What actions should be taken in response to this?

Notes

Unit 5: Risk Management and Safety

STUDENT MANUAL

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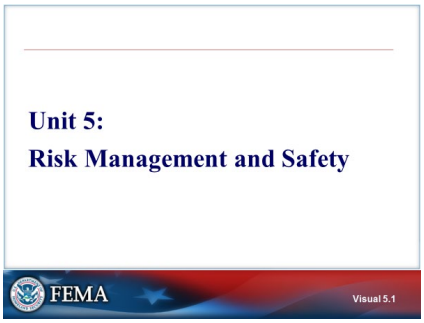
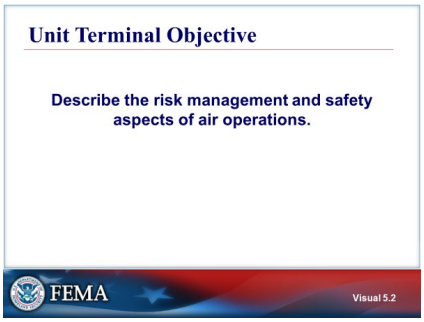


Visual 5.1

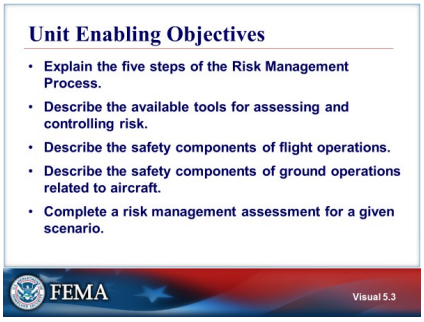
UNIT 5: RISK MANAGEMENT AND SAFETY



Visual 5.2

UNIT TERMINAL OBJECTIVE

Describe the risk management and safety aspects of air operations.



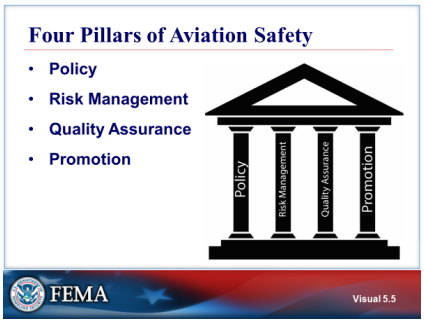
Visual 5.3

UNIT ENABLING OBJECTIVES

- Explain the five steps of the Risk Management Process.
- Describe the available tools for assessing and controlling risk.
- Describe the safety components of flight operations.
- Describe the safety components of ground operations related to aircraft.
- Complete a risk management assessment for a given scenario.

Visual 5.4

AVIATION SAFETY RESPONSIBILITIES

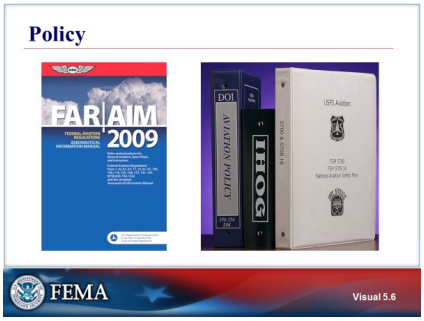


Visual 5.5

FOUR PILLARS OF AVIATION SAFETY

Aviation safety rests on these four pillars:

- Policy
- Risk Management
- Quality Assurance
- Promotion

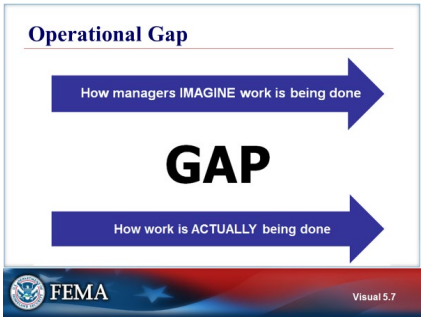


Visual 5.6

POLICY

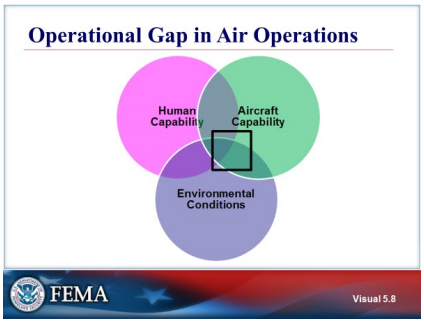
Policy is derived from the following documents:

- Incident Command Safety Policy
- Agency handbooks, manuals, and guides
- Organization and position requirements
- Position Task Books



Visual 5.7

OPERATIONAL GAP



Visual 5.8

OPERATIONAL GAP IN AIR OPERATIONS

Three components affect air operations:

- Human capability
- Aircraft capability
- Environmental conditions

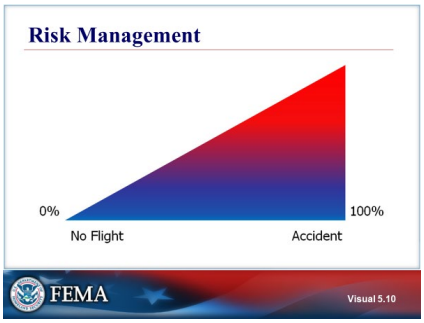
Where all three circles intersect represents operations: the interaction of humans, aircraft and the environment to meet the incident needs.

The box in the center represents policy. It is skewed slightly and demonstrates that policy does not cover everything that needs to be considered and that sometimes people unintentionally operate outside the guidelines of policy.

Visual 5.9

RISK MANAGEMENT AND HUMAN PERFORMANCE

To understand risk management, you first need to look at human performance. Humans are error prone and make an average of 300 mistakes a day, such as misplacing keys, spilling coffee, forgetting to lock doors, etc. People make mistakes so you have to have a plan. If your plan does not account for mistakes, you will have problems.



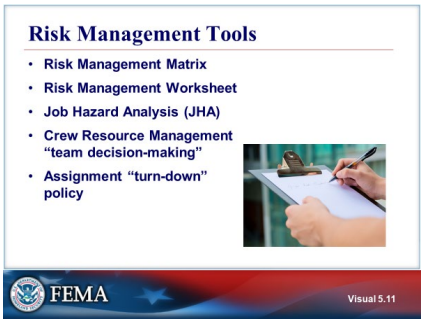
Visual 5.10

RISK MANAGEMENT

Degree of Risk concept.

Any flight mission has a degree of risk that varies from 0% risk (no flight activity) to 100% (when an accident occurs). Your challenge is to ensure that you do all you can to identify and mitigate potential risks.

Public safety aviation, particularly in response to disasters, is inherently risky. The job of aviation managers is to establish a risk management process that is on-going and designed to identify hazards, assess the risks associated with the hazards, implement controls whenever possible to mitigate the risk, monitor and evaluate those controls, and actively supervise the entire risk management process.



Visual 5.11

RISK MANAGEMENT TOOLS

Refer to Handout 5-1: Risk Assessment Matrix and Handout 5-2: Risk Assessment Worksheet found in the Unit 5 Supplemental Materials.

Use the available tools to help you assess and control for risk.

Risk Assessment Matrix

- Used for a general hazard assessment
- Define the severity and probability of an undesirable event that could result from the hazard
- Severity x Probability = Risk

Risk Management Worksheet

- Detect the hazards and determining the level of risk.
- Determine the hazard and what happens if the operation is exposed to the hazard.
- Determine the context of the hazard:
  - Equipment
  - People
  - Environment

Job Hazard Analysis 29 CFR 1910.132 (d)

- Requires employers to be aware of present and likely hazards.
- Must analyze hazards.

Crew Resource Management and "Team Decision \Making"

- Everyone on the crew has a say in the decision to go or not go.
- Risk assessment and mitigation is everyone's responsibility.
- In multi-person crews, the team makes the decision, not just one person.

Assignment “Turn-Down” Policy

A “turn down” is a situation where an individual has determined that he or she cannot undertake an assignment as given and is unable to negotiate an alternative solution. The turn down of an assignment must be based on an assessment of the risks and the ability of the individual or organization to control or mitigate those risks. Individuals may turn down an assignment when:

- There is a violation of regulated safe aviation practices.
- Environmental conditions make the work unsafe.
- They lack the necessary qualifications or expertise.

Individuals will directly inform their Supervisor that they are turning down the assignment as given. The most appropriate means for documenting turn-down criteria is using the Aviation “Watch Out” Situations (Incident Response Pocket Guide p. 46).

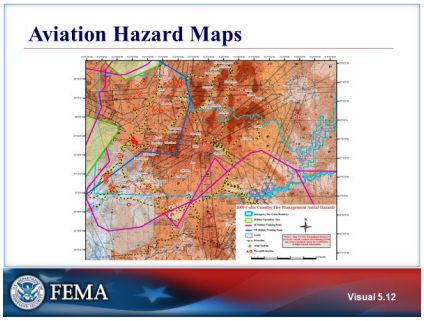
The supervisor will notify the Air Operations Branch Director (AOBD) immediately upon being informed of a turn down. If there is no AOBD, notification shall go to the appropriate Section Chief, the Incident Commander, or the local Aviation Manager. Proper handling of turn downs provides accountability for the decision and initiates communication of safety concerns within the incident organization.

If the assignment has been turned down previously and the Supervisor asks another resource to perform the assignment, he or she is responsible for informing the new resource that the assignment has been turned down and the reasons why. Furthermore, personnel need to realize that a turn down does not stop the completion of the assigned operation. The turn-down protocol is an integral element that improves the effective management of risk, provides timely identification of hazards within the chain of command, raises the risk awareness of both Supervisors and subordinates, and promotes accountability.

If an unresolved safety hazard exists, the individual needs to communicate the issue/event/concern

immediately to his or her Supervisor and document the situation.

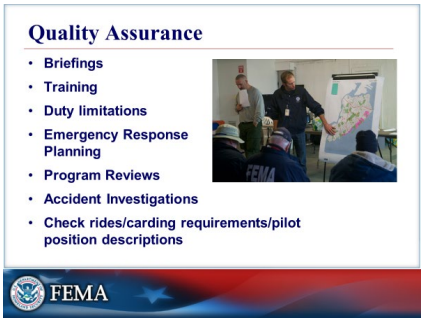
Pilots and crews can feel pressure (verbal or otherwise) to perform missions which they feel are unsafe due to weather of other flight conditions. This pressure may come from peers or it may come from their agency based on what the agency has contracted to do and what the agency is being paid for. Even though pilots know logically that a mission should be turned down, some pilots will not turn down a mission because they believe it is critical and worth the risk, or they fear their peers may think less of them, or they believe there might be repercussions from their agency. It is critical to make a logical, practical risk assessment and use knowledge of human factors and communication to determine when a mission is a no-go, even though no pilot has expressed concern.



Visual 5.12

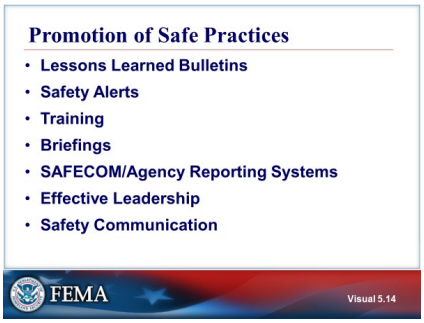
AVIATION HAZARD MAP

Aviation hazard maps are also an excellent risk management resource.



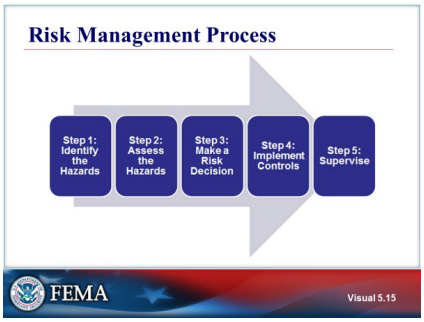
Visual 5.13

QUALITY ASSURANCE



Visual 5.14

PROMOTION OF SAFE PRACTICES

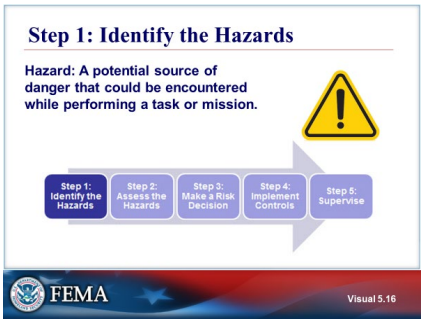


Visual 5.15

RISK MANAGEMENT PROCESS

The Risk Management Process includes five steps:

- Step 1: **I**dentify the hazards related to the operation.
- Step 2: **A**ssess each hazard within its proper context:
  - Equipment
  - People
  - Environment
- Step 3: **M**ake a risk decision.
  - Assign a value for severity and probability for each hazard.
  - Using the matrix, multiply the two values to determine the level of risk.
- Step 4: **I**mplement control measures to mitigate the risk:
  - Recalculate the risk based on the mitigation efforts.
  - Determine whether the mission can be accomplished based on the level of risk.
- Step 5: **S**upervise:
  - Approve as necessary.
    - Follow-up to evaluate the effectiveness of the control measures.
    - Debrief and review the lessons learned.

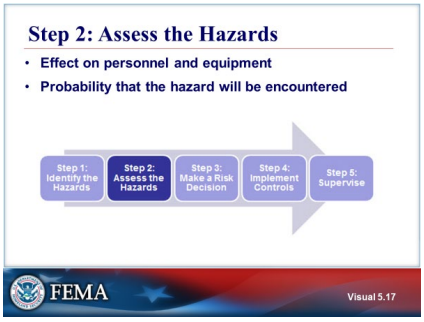


Visual 5.16

STEP 1: IDENTIFY THE HAZARDS

Factors that determine hazards include the following:

- Equipment:
  -
  -
  -
  -
- People:
  -
  -
  -
  -
-
-
- Time of flight
- Terrain

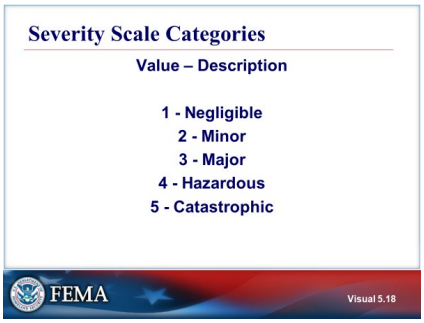


Visual 5.17

STEP 2: ASSESS THE HAZARDS

Step 2 of the Risk Management Process is to assess the hazards you have identified. To do this, you will use the Risk Assessment Matrix to determine the:

- Severity: the significance of the effect on personnel and equipment if the hazard is encountered.
- Probability: the likelihood that the hazard will be encountered.

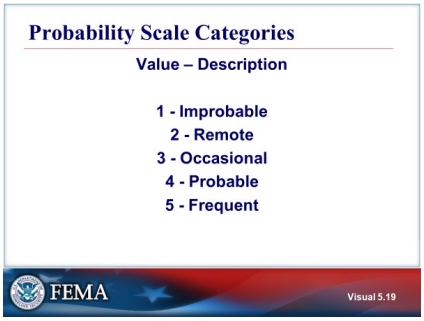


Visual 5.18

SEVERITY SCALE CATEGORIES

The Severity Scale categories are:

- **Negligible**: Little or no consequences; results in less than minor injury and/or less than minor system damage.
- **Minor:** May require the use of emergency procedures; considered a minor incident or nuisance.
- **Major:** A significant reduction in safety margins and a reduction in the ability of the operator to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency. Injury to persons is likely and it is considered a serious incident.
- **Hazardous:** A large reduction in safety margins and physical distress or a workload such that the operator cannot be relied upon to perform their tasks accurately or completely; serious injury is likely to occur along with major equipment damage.
- **Catastrophic:** Results in fatalities and/or loss of the system.

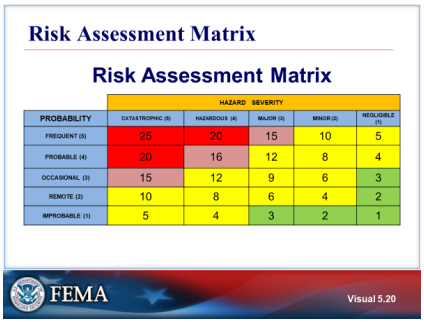


Visual 5.19

PROBABILITY SCALE CATEGORIES

The Probability Scale definitions are:

- **Improbable:** Almost inconceivable that the event will occur. So unlikely that it can be assumed that it will not occur; unlikely to occur, but possible.
- **Remote:** Very unlikely to occur, but possible (instances have been recorded).
- **Occasional:** Unlikely under existing conditions, but possible (has occurred rarely).
- **Probable:** Likely to occur sometime (has occurred, but infrequently).
- **Frequent:** Likely to occur many times (has occurred frequently).



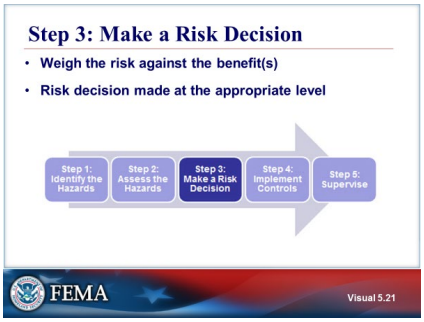
Visual 5.20

RISK ASSESSMENT MATRIX

Step 2 of the Risk Management Process involves using a Risk Assessment Matrix to determine the effect on personnel and equipment if the hazard is encountered and the probability that the hazard will be encountered.

Keep in mind that even risks with high severity are usually handled with minimal issues when they are high frequency, because the personnel involved are constantly managing those situations. It is the incidents with high severity and low frequency that usually result in the most severe consequences and injuries.

Refer to Handout 5-1: Risk Assessment Matrix.

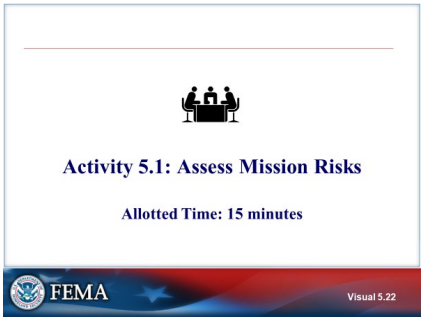


Visual 5.21

STEP 3: MAKE A RISK DECISION

When making a decision with regard to risk, always:

- Weigh the risk against the benefit(s) of performing the operation.
- Ensure that the risk decision is made at a level of command that corresponds to the degree of risk.

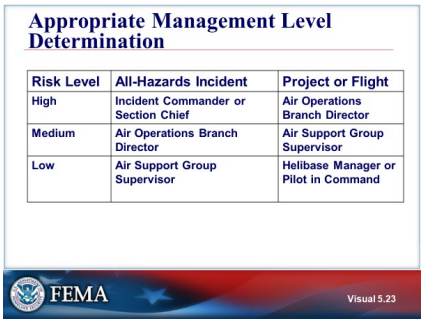


Visual 5.22

ACTIVITY 5.1: ASSESS MISSION RISKS

The instructor will explain Activity 5.1.

You will have 15 minutes to complete the activity.

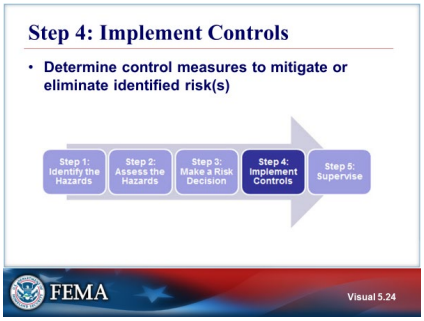


Visual 5.23

APPROPRIATE MANAGEMENT LEVEL DETERMINATION

The "Appropriate Management Level for Operational Risk Decisions" table is used to determine the appropriate management level for operational risk decisions.

Risk management decisions should always be made at the appropriate management level. The appropriate management level for operational risk decisions can be determined using the table shown on the visual.



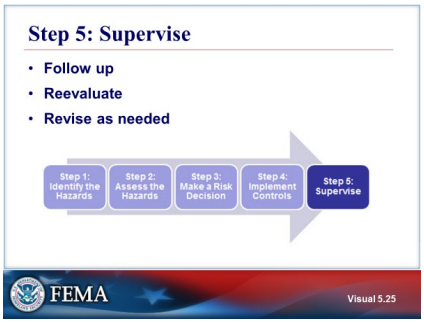
Visual 5.24

STEP 4: IMPLEMENT CONTROLS

Step 4 of the Risk Management Process is to implement the control measures established as a result of steps 1 through 3. This step involves making a determination as to what control measures should be implemented to mitigate (reduce) or eliminate the identified risk(s). Control measures may be as substantial as writing a special-use plan or as simple as conducting a short safety briefing.

If a decision were made to fly, then the AOBD might direct the Helibase Manager to present a briefing to the pilot(s) with the following parameters:

1. Determine how quickly the supplies can be prepared for airlift and the time it will take to fly the mission.
2. Use only one aircraft for greater control.
3. Choose the most highly skilled pilot for the mission.
4. Weigh the positive benefits and negative factors associated with long-lining the cargo versus carrying it internally into an unlit helispot.
5. If winds increase or visibility deteriorates beyond safe minimums at either the Helibase or at the site, then the mission will be canceled.

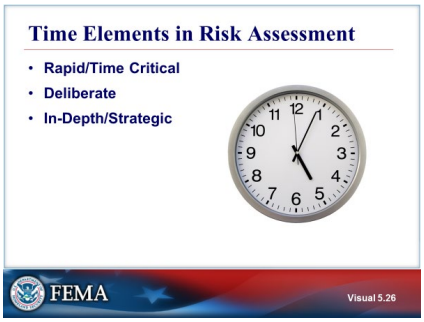


Visual 5.25

STEP 5: SUPERVISE

Step 5 Supervision includes the following:

- Following up during and after a mission to ensure that all went according to plan.
- Reevaluating the plan, as required, to accommodate unforeseen issues.
- Incorporating lessons learned and revising the plan as needed.
    - This may be included as a part of the nightly debriefing.



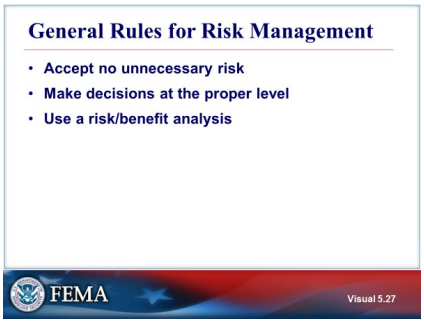
Visual 5.26

TIME ELEMENTS IN RISK ASSESSMENT

Performance of a risk assessment is limited by the amount of time available for planning, requires flexibility and judgment, and includes the following:

Risk assessments can be divided into three categories according to the time element:

- Rapid/Time Critical Risk Assessment (required when planning time is minimal)
- Deliberate Risk Assessment (used when planning time permits)
- In-Depth/Strategic Risk Assessment (used when):
    - New technology is being proposed
    - Risks appear high
    - Time and resources allow a thorough assessment



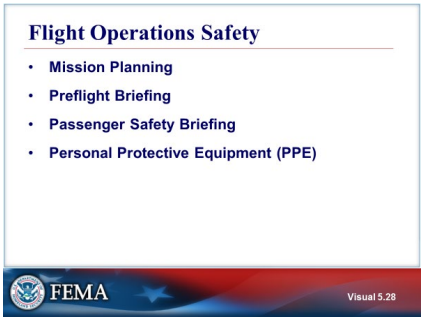
Visual 5.27

GENERAL RULES FOR RISK MANAGEMENT

Risk Management rules.

- Accept no unnecessary risk.
- Make decisions at the proper level.
- Use a risk/benefit analysis that involves a thorough risk assessment based on the hazards associated with the mission without regard for the consequences of not accomplishing the mission.

To do otherwise places a higher priority on mission accomplishment than on safety.



Visual 5.28

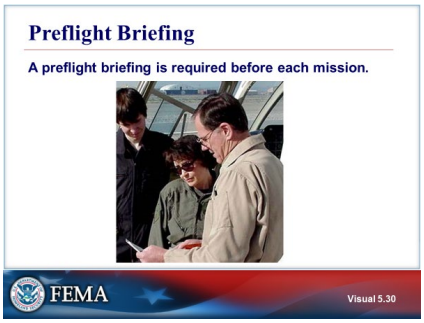
FLIGHT OPERATIONS SAFETY

Visual 5.29

MISSION PLANNING

Mission planning with a strong and continuous focus on safety is an essential part of every aviation operation. Careful pre-planning is critical to ensuring that aviation missions are completed safely and efficiently.

As a team effort, it is critical that the Air Tactical Group Supervisor (ATGS) be involved in the mission planning process to match proposed missions with available aircraft and crews.



Visual 5.30

PREFLIGHT BRIEFING

The Flight Manager is responsible for providing the pilot with a briefing that is specific to the mission.

Before the flight, the pilot should be provided with or notified about the following:

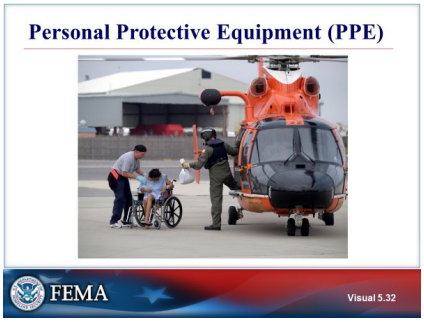
- Specifics of the mission
- Manifest with the accurate weights of passengers
- Accurate weight of the cargo
- All hazardous materials to be transported
- Radio frequencies
- Flight following procedures
- Other aircraft that may be in the area
- Current and forecasted weather conditions
- Airspace issues
- Aerial and ground hazards in the flight area (review the Hazard Map)
- Visual inspection of the aircraft's condition

Visual 5.31

PASSENGER SAFETY BRIEFING

Before any flight, all passengers must receive a passenger safety briefing from the pilot or flight crew personnel. The briefing should include the following:

- Procedures for approaching, entering and exiting, and departing the aircraft
- Loading and storage of gear or cargo
- Smoking rules
- In-flight rules
- Seat belt use and seat back in upright position
- Location and operation of emergency exits and passenger doors
- Use of oxygen, if appropriate
- Location and operation of fire extinguisher(s)
- Location of the first aid kit and survival equipment
- Location and operation of the Emergency Locator Transmitter (ELT)
- Crash positions

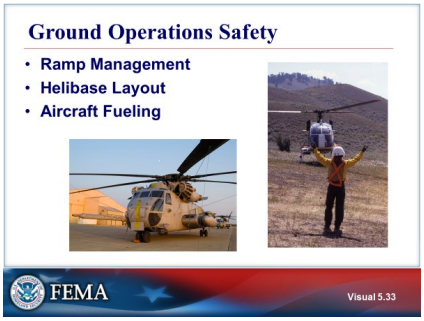


Visual 5.32

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Appropriate PPE for the mission should always be used. What PPE is required depends on whether you are flying in a fixed wing aircraft or a helicopter.

Headsets for hearing protection with communications capability for all passengers are a necessity.



Visual 5.33

GROUND OPERATIONS SAFETY

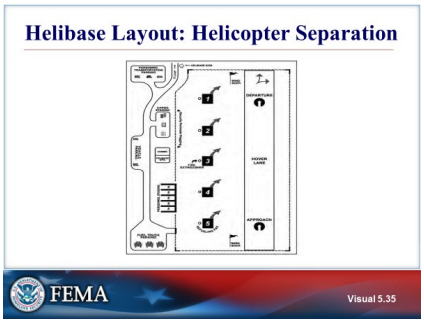
Personnel, especially personnel who are unfamiliar with aircraft operations, must be briefed continuously on the hazards operating in and around operational heliports, airports, and helispots.

Visual 5.34

RAMP MANAGEMENT

Ramp management involves ensuring that the ground operations in the take-off/landing area are conducted safely, as follows:

- Coordinating communications both before and during daily operations
- Ensuring dust abatement for any helibase areas that require it
- Ensuring that vehicle traffic and parking and staging areas are kept separate from flight operations and over flights by departing and arriving helicopters
- Ensuring that emergency landing areas are established and assigned personnel understand crash-rescue requirements
- Briefing passengers
- Loading and unloading of cargo and personnel
- Ensuring aircraft fueling is performed according to standards and procedures



Visual 5.35

HELIBASE LAYOUT: HELICOPTER SEPARATION

Recommended separation of Helicopters at Helibases

Type	I	II	III
Rotor to Rotor Separation	100’	75’	60’
Pad to Pad Separation	200’	125’	90’

NOTE: While these recommended distances are not mandatory, they can be used to provide appropriate separation between helicopters.

The full details with regard to ramp operations and safety can be found in Chapter 8 of Interagency Helicopter Operations Guide (IHOG) and FAA Advisory Circular 150-5390-2: Heliport Designs.

Difference between a helibase and a helispot. Helibase has:

- Multiple aircraft
- Cargo staging

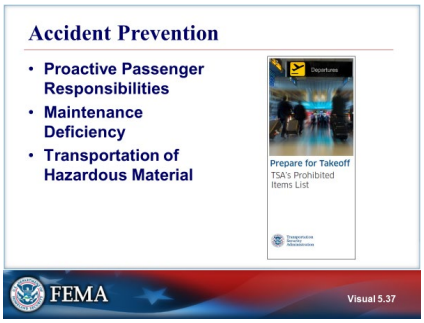
Visual 5.36

AIRCRAFT FUELING

Refueling is generally the responsibility of the pilot or contractor. However, everyone is responsible for helping to ensure that refueling is done safely. Ensuring that aircraft refueling is conducted according to procedures is the responsibility of the Helibase Manager.

The safety practices for refueling include the following:

- No passengers on board
- No smoking within 50 feet

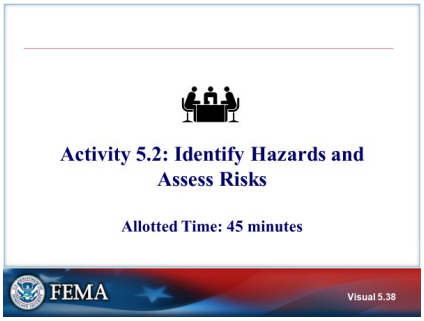


Visual 5.37

ACCIDENT PREVENTION

- Proactive Passenger Responsibilities: Passengers also have a responsibility for accident prevention. They should recognize and report unsafe situations and decline flights that they feel are unsafe.
- Maintenance Deficiency: A maintenance deficiency is any serious defect or failure that causes mechanical difficulties to be encountered in aircraft operations that are not specifically identified as an aircraft incident or aviation hazard.
  - Example: An aircraft engine will not start.
- Transportation of Hazardous Materials: A hazardous material is a substance or material that has been determined by the U.S. Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce.

The Transportation Security Administration (http://www.tsa.gov) provides a list of items that are prohibited for carry on by passengers on commercial flights.

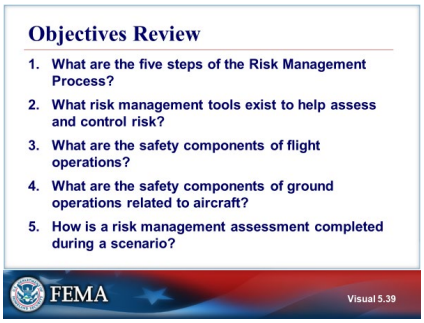


Visual 5.38

ACTIVITY 5.2: IDENTIFY HAZARDS AND ASSESS RISKS

The instructor will explain Activity 5.2.

You will have 45 minutes to complete the activity.



Visual 5.39

OBJECTIVES REVIEW

Unit Enabling Objectives

- Explain the five steps of the Risk Management Process.
- Describe the available tools for assessing and controlling risk.
- Describe the safety components of flight operations.
- Describe the safety components of ground operations related to aircraft.
- Complete a risk management assessment for a given scenario.

Supplemental Materials

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Handout 5-1: Risk Assessment Matrix

Risk Assessment Matrix

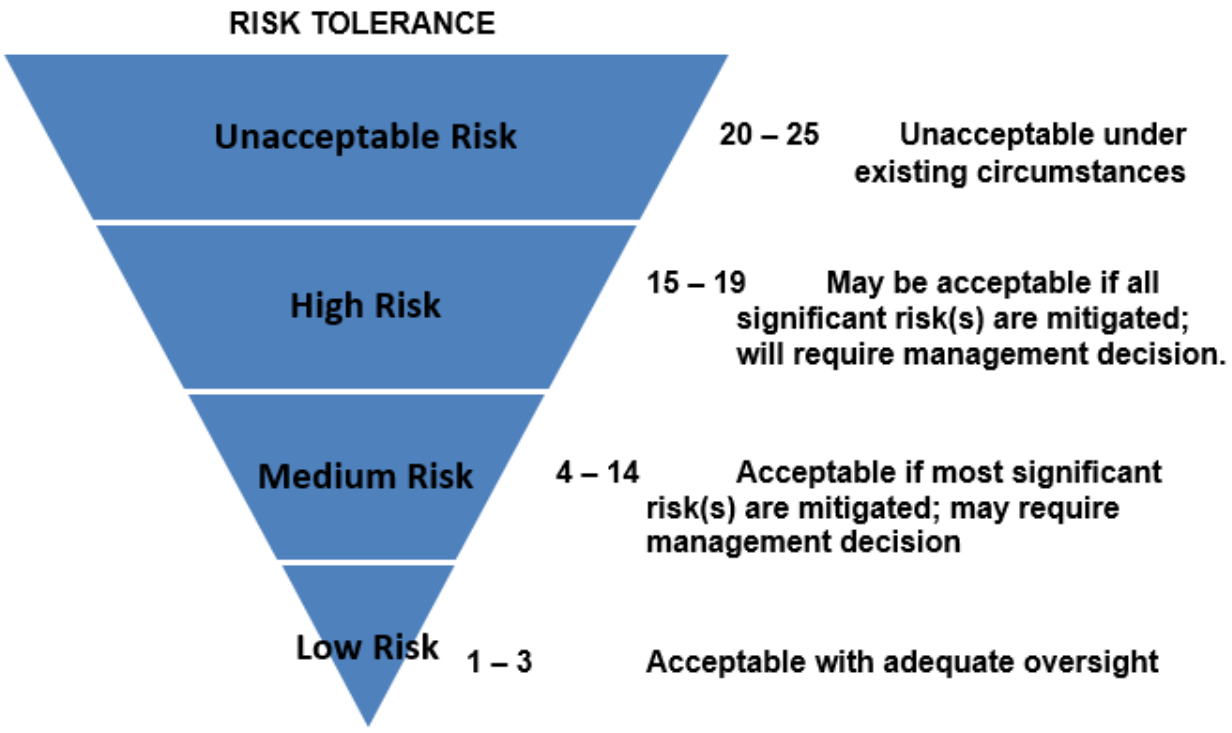
	HAZARD SEVERITY				
PROBABILITY	**CATASTROPHIC (5)**	**HAZARDOUS (4)**	**MAJOR (3)**	**MINOR (2)**	**NEGLIGIBLE (1)**
FREQUENT (5)	25	20	15	10	5
PROBABLE (4)	20	16	12	8	4
OCCASSIONAL (3)	15	12	9	6	3
REMOTE (2)	10	8	6	4	2
IMPROBABLE (1)	5	4	3	2	1

SEVERITY

VALUE	DESCRIPTION
1	**Negligible:** • Few consequences
2	**Minor:** • Nuisance • Use of emergency procedures • Minor incident
3	**Major:** • A significant reduction in safety margins; a reduction in the ability of the operator to cope with adverse operating conditions as a result of an increase in workload; or as a result of conditions impairing their efficiency • Serious incident • Injury to persons
4	**Hazardous:** • A large reduction in safety margins, physical distress or a workload such that the operator cannot be relied upon to perform their tasks accurately or completely • Serious injury • Major equipment damage
5	**Catastrophic:** • Critical equipment destroyed • Fatalities

PROBABILITY

VALUE	DESCRIPTION
1	**Improbable:** Almost inconceivable that the event will occur.
2	**Remote:** Very unlikely to occur (instances have been recorded)
3	**Occasional:** Unlikely under existing conditions, but possible to occur (has occurred rarely)
4	**Probable:** Likely to occur sometimes (has occurred but infrequently)
5	**Frequent:** Likely to occur many times (has occurred frequently)



Handout 5-2: Risk Assessment Worksheet

Assess the risks involved in the proposed operation. Use additional sheets if necessary.

Risk Assessment Matrix

	HAZARD SEVERITY				
PROBABILITY	**CATASTROPHIC (5)**	**HAZARDOUS (4)**	**MAJOR (3)**	**MINOR (2)**	**NEGLIGIBLE (1)**
FREQUENT (5)	25	20	15	10	5
PROBABLE (4)	20	16	12	8	4
OCCASSIONAL (3)	15	12	9	6	3
REMOTE (2)	10	8	6	4	2
IMPROBABLE (1)	5	4	3	2	1

Assignment:	Date:

Describe the hazard: **Pre-mitigation hazards rate out as:**	Probability (1 – 5)	Severity (1 – 5)	Risk Level
Mitigation controls: **Post-mitigation hazards rate out as:**	Probability (1 – 5)	Severity (1 – 5)	Risk Level

Operation Approved by	Title:	Date:

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Activity 5.1: Assess Mission Risks

Activity 5.1 — Unit 5

Purpose

The purpose of this activity is to provide students with experience using a Risk Assessment Matrix to assess mission risks.

Objectives

Students will accomplish the following:

- Assess the identified risks for a given scenario using the Risk Assessment Matrix.
- Determine whether the level of risk is acceptable for the given scenario.

Activity Structure

This activity is scheduled to last approximately 15 minutes, including the small group activity and classroom discussion. After the instructor reads the scenario aloud to the class, the students will work in small groups to assess the risks they identify using Handout 5-2: Risk Assessment Matrix. They will also determine whether the level of risk is acceptable for the given scenario.

Rules, Roles, and Responsibilities

The following are the specific activities / instructions for your participation in the activity:

1. After breaking into small groups, review the activity scenario.
2. Within your small group, identify a spokesperson.
3. Use the Risk Assessment Matrix, assess the risks that you identify for this mission.
4. Determine whether the level of risk is acceptable for this mission.
5. Be prepared to share your answers with the rest of the class.

Instructors moderate discussions, answer questions and provide additional information as required.

Activity 5.1 Schedule

Activity	Duration	Participation Type
Activity Introduction and Overview	2 minutes	Classroom
Activity	10 minutes	Small Groups
Review/Discussion	5 minutes	Classroom

Activity 5.1 Scenario

The helibase manager receives a mission to air lift approximately 2,000 lbs. of food, water, and supplies to families, several of whom have young children, who have been stranded by flood waters and have been cut off from any source of food and fresh water for 3 days. The distance to the drop point is approximately 20 miles.

Weather conditions are quickly deteriorating, with a front that is due to move into the area within the hour. Current conditions are very windy (estimated to be 20 knots with occasional gusts to 35 knots) from approaching thunderstorms. Daylight visibility is decreasing as sunset nears, and although the helispot is large, it is unlit for nighttime operations.

The extended forecast is for severe weather (thunderstorms, hail, and possible floods) throughout the night.

Activity 5.1 Notes

Assess the risks involved in the proposed operation. Use additional sheets if necessary.

Risk Assessment Matrix

	HAZARD SEVERITY				
PROBABILITY	**CATASTROPHIC (5)**	**HAZARDOUS (4)**	**MAJOR (3)**	**MINOR (2)**	**NEGLIGIBLE (1)**
FREQUENT (5)	25	20	15	10	5
PROBABLE (4)	20	16	12	8	4
OCCASSIONAL (3)	15	12	9	6	3
REMOTE (2)	10	8	6	4	2
IMPROBABLE (1)	5	4	3	2	1

Assignment:	Date:

Describe the hazard: **Pre-mitigation hazards rate out as:**	Probability (1 – 5)	Severity (1 – 5)	Risk Level
Mitigation controls: **Post-mitigation hazards rate out as:**	Probability (1 – 5)	Severity (1 – 5)	Risk Level

Operation Approved by	Title:	Date:

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Activity 5.2: Identify Hazards and Assess Risks

Activity 5.2 — Unit 5

Purpose

The purpose of this activity is to give students the opportunity to apply their knowledge of the five-step Risk Management Process to a scenario.

Objectives

Students will:

- Identify hazards and assess risks using their knowledge of the five-step Risk Management Process.

Activity Structure

This activity is scheduled to last approximately 45 minutes, including small group discussion, presentation of group findings, and classroom discussion. The students will break into small groups and review the assigned scenario, using their knowledge of the Risk Management Process to identify what they would do in each of the scenarios presented. The class will reassemble and discuss their findings.

Rules, Roles, and Responsibilities

The following are the specific activities / instructions for your participation in the activity:

1. Select a spokesperson for your group.
2. For your assigned scenario:
   a. Review the scenario.
   b. Identify what you would do during each step in the Risk Management Process.
   c. Record your answers.
3. Share your answers with the class.

Instructors assign a scenario to each group, moderate discussions, answer questions, and provide additional information as required.

Activity 5.2 Schedule

Activity	Duration	Participation Type
Activity Introduction and Overview	2 minutes	Classroom
Review Scenario	5 minutes	Small Groups
Record Information	20 minutes	Small Groups
Conduct Debrief	20 minutes	Classroom

Activity 5.2 Scenarios

Risk Management Scenario #1

For the past few days, the weather has been too bad for you and your group to fly the scheduled yearly wildlife survey. You have completed 2 of the 7 days of flight and need to complete the remaining days to meet your supervisor's deadline. Time is against you, and your supervisor is in a hurry to submit this wildlife report for next year's budget planning.

Mission:

The weather looks good today, with some possible afternoon fog in the mountains. The pilot has flown helicopters and airplanes for 29 years, and is considered a good pilot. You and your group meet with the pilot and decide to fly, completing some of the surveys. You leave the airport in the helicopter and choose to survey three of the lower sites first, and then finish the upper slope sites in the afternoon.

You and your group are pleased with your accomplishments at the lower sites and decide to attempt to finish the upper slope sites. You call into the office on your radio and tell your supervisor that you have the finished three lower sites with good results. Your supervisor congratulates you, but emphasizes the importance of completing the upper sites as soon as possible. As you approach the upper sites, you see fog in the distance. It looks like the fog may be moving into your area within the hour. You land at the upper sites and prepare your survey gear. Because the weather is beginning to get cooler with fog approaching, the pilot decides to stay in the helicopter.

The pilot is becoming impatient because the fog has moved in, although he does understand the importance of the project deadline. The fog is getting worse, and as you return to the helicopter there is only about 800 feet of visibility.

Directions: Using the five steps of the Risk Management Process, discuss your ideas/considerations within your small group.

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Risk Management Scenario #2

Personnel assigned to the Southern Patrol Zone were conducting a marijuana eradication operation in the Angeles National Forest. This operation was in conjunction with the Los Angeles County Sheriff's Department and the Monrovia Police Department. This was the sixth consecutive day of operations. Law enforcement personnel were inserted into the target area by a U.S. Army Sikorsky UH-60A Black Hawk at approximately 0830 hours the same day (in accordance with agency-approved procedures involving active duty U.S. Army helicopters and pilots).

The insertion location was approximately one half mile north of the first marijuana site on a hogback ridge. After hiking downhill to the first location, law enforcement personnel encountered multiple armed suspects at the site. The suspects fled the site, but remained concealed in the immediate area. While securing the site, officers recovered two weapons and spent 7.62 caliber shell casings.

While confronting 100 degree plus temperatures, oncoming darkness, armed suspects in the vicinity, and no safe route of egress to traverse the 2 miles of terrain back to a trail or highway, law enforcement personnel constructed helispots for sling load operations and water re-supply in the canyon. They used hand tools and a Homelite chain saw for helispot construction until the chain saw broke down. No replacement chainsaws were available for the duration of the mission. They are requesting to sling load the supplies in.

Directions: Using the five steps of the Risk Management Process, discuss your ideas/considerations within your small group.

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Risk Management Scenario #3

The Interagency Communications Center is not capable of using the National Flight Following frequency due to interference from another frequency, equipment issues, and/or system difficulties. The primary plan for flight following for aircraft works through a link with a mountain repeater.

These repeater sites are linked to a remote base on the mountain, which has not been working due to ice damage to some repeater components last winter. Therefore, communication throughout the northern parts of the zone is compromised.

The system has functioned intermittently since last winter, and there is no flight following to maintain positive communication with aircraft and ground personnel.

Directions: Using the five steps of the Risk Management Process, discuss your ideas/considerations within your small group.

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Risk Management Scenario #4

Your Type III team has been assigned to a mudslide incident in New Mexico. Aviation resources are very limited because of a very large number of fires in the Western States. Due to an especially heavy monsoon event, the town of Los Alamos has effectively been cut off. Because of the presence of the Los Alamos National Laboratory, it is a priority to use aircraft to move VIP's, provide logistical support and perform reconnaissance and mapping.

You will be allowed to use the airport for your helibase. The elevation is 7170 feet and there are restricted air spaces around the airport, for security reasons. Assigned to the incident at this time are (2) New Mexico National Guard C-130's, the Lab's 212, a CWN (Call-when-needed) 205++, and a CWN Bell 407. Most of the logistical support and VIP manifesting will be coordinated from the Santa Fe Airport.

Directions: Using the five steps of the Risk Management Process, discuss your ideas/considerations within your small group.

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Risk Management Scenario #5

Fog on the Interstate near your agency has caused a large traffic pile-up. Over 100 cars are involved, with many injured needing to be transported by air to regional trauma centers. Fires are burning in several locations. While the fog has lifted, the cold weather continues to generate small pockets. Helicopters from hospital based EMS systems, Law Enforcement and the media are enroute to the incident. It is not known if there are common communications or designated landing sites. The Highway Patrol has Incident Command Authority but it's unclear if they have established an Incident Command Post.

Directions: Using the five steps of the Risk Management Process, discuss your ideas/considerations within your small group.

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Assess the risks involved in the proposed operation. Use additional sheets if necessary.

Risk Assessment Matrix

	HAZARD SEVERITY				
PROBABILITY	**CATASTROPHIC (5)**	**HAZARDOUS (4)**	**MAJOR (3)**	**MINOR (2)**	**NEGLIGIBLE (1)**
FREQUENT (5)	25	20	15	10	5
PROBABLE (4)	20	16	12	8	4
OCCASSIONAL (3)	15	12	9	6	3
REMOTE (2)	10	8	6	4	2
IMPROBABLE (1)	5	4	3	2	1

Assignment:	Date:

Describe the hazard: **Pre-mitigation hazards rate out as:**	Probability (1 – 5)	Severity (1 – 5)	Risk Level
Mitigation controls: **Post-mitigation hazards rate out as:**	Probability (1 – 5)	Severity (1 – 5)	Risk Level

Operation Approved by	Title:	Date:

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Unit 6: Capstone Activity

STUDENT MANUAL

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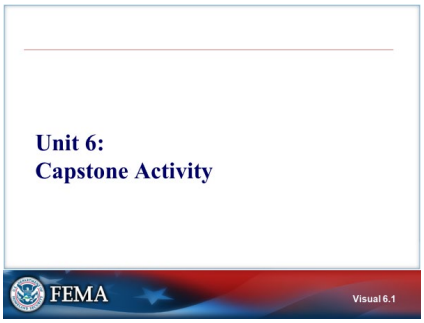
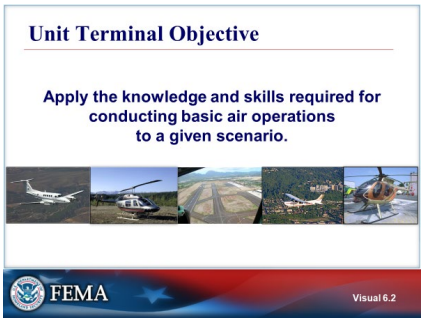


Visual 6.1

UNIT 6: CAPSTONE ACTIVITY



Visual 6.2

UNIT TERMINAL OBJECTIVE

Apply the knowledge and skills required for conducting basic air operations to a given scenario.

Visual 6.3

UNIT ENABLING OBJECTIVES

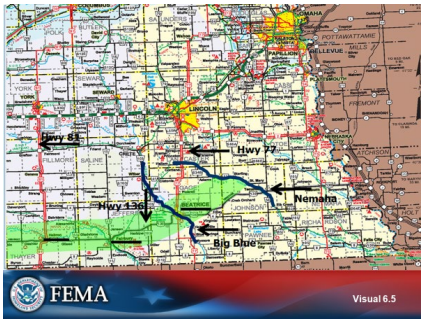
- Identify locations for a fixed-wing base and two helibases.
- Identify issues related to contractors.
- Provide the center point, radius, and rationale for a TFR.
- Determine the type of aircraft required for a specific mission.
- Explain the steps for dealing with a TFR intrusion.

Visual 6.4

ACTIVITY 6.1 CAPSTONE

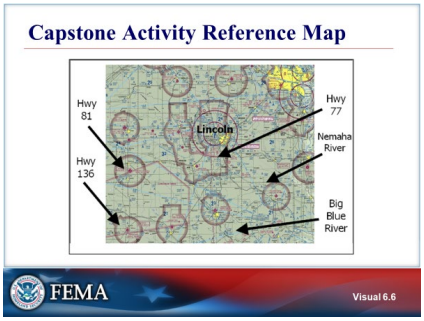
The instructor will explain Activity 6.1: Capstone.

You will have 2 hours to complete the activity. The remaining 35 minutes will be a debrief.



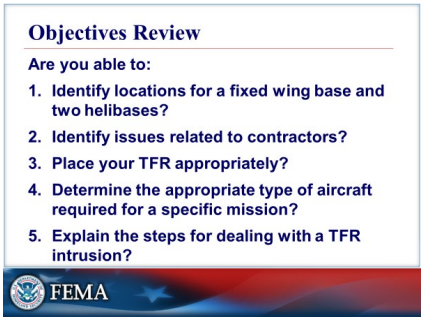
Visual 6.5

CAPSTONE ACTIVITY SCENARIO MAP



Visual 6.6

CAPSTONE ACTIVITY REFERENCE MAP



Visual 6.7

OBJECTIVES REVIEW

Unit Enabling Objectives

- Identify locations for a fixed-wing base and two helibases.
- Identify issues related to contractors.
- Provide the center point, radius, and rationale for a TFR.
- Determine the type of aircraft required for a specific mission.
- Explain the steps for dealing with a TFR intrusion.

Supplemental Materials

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Activity 6.1: Capstone Activity

Purpose

The purpose of this activity is for students to demonstrate the knowledge and skills required for conducting basic air operations.

Objectives

Students will accomplish the following:

- Identify locations for a fixed wing base and two helibases.
- Identify issues related to contractors.
- Provide the center point, radius, and rationale for a TFR.
- Determine the type of aircraft required for a specific mission.
- Explain the steps for dealing with a TFR intrusion.

Activity Structure

This activity is scheduled to last approximately 2 hours and 45 minutes, including small group work, presentation of group findings, and classroom discussion. Instructors will hand out aeronautical sectional charts (one per group) and review the activity scenario. The students will then complete the required tasks, writing their answers on an easel pad and plotting the appropriate data on the aeronautical sectional chart. The groups will then present their solutions to the entire class and the instructor will conduct a discussion of the students' proposed solutions in relation to the suggested solutions.

Rules, Roles, and Responsibilities

The following are the specific activities/instructions for your participation in this activity:

1. Within your small group, select a spokesperson.
2. Review the activity scenario and reference map.
3. Use the Omaha Aeronautical Sectional (https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/vfr/) to answer the following activity questions on your group's easel pad. Do NOT mark directly on the sectional map.
4. Present your group's findings to the entire class.

Instructors will collect and review the TFR request form and provide written feedback, answer questions, provide additional information as required, and review the suggested solutions in conjunction with the class presentations.

Activity 6.1 Schedule

Activity	Duration	Participation Type
Activity Introduction and Overview	10 minutes	Classroom
Discussion/Activity	2 hours	Small Groups
Presentations/Debrief	50 minutes	Classroom

Activity 6.1 Scenario

You have been ordered to Lincoln, Nebraska. Several F2–F4 tornados occurred within a 4 hour period on 4/20 and caused widespread damage. The intense storm had unusually large tornado path lengths and widths and dropped 4 inches of rain in 12 hours in some areas.

The Little Blue, Big Blue, and North Fork of the Big Nemaha rivers are projected to crest well above flood stage in the next 24 hours

Highway 81, which runs north through Hebron, Highway 77 that runs north from Beatrice, and Highway 136, which connects Hebron with Fairbury and Beatrice, have suffered flood damage and are closed

Hebron, Fairbury, and Beatrice have all suffered storm and flood damage resulting in limited ground access. Hundreds are homeless, and there has been major damage to domestic water, storm water, and sewage treatment infrastructure.

The results of the storm includes key infrastructure damage in the affected areas; hundreds of homes are destroyed or damaged; major damage has occurred to a hospital, assisted living facility, and elementary school from a tornado; and hundreds require temporary shelter.

Urban Search and Rescue (US&R) Task Forces from Colorado and Missouri have been activated to assist the Nebraska US&R Task Force. The Colorado Task Force will be flying in on a Colorado National Guard C130.

The 20 patients from the Beatrice critical access hospital and 76 residents at the assisted living facility need to be evacuated to other hospitals and care facilities in Lincoln and Omaha.

The Nebraska National Guard is based at the Lincoln airport.

Air Assets

So far two Type II helicopters, one Type III helicopter, and one fixed-wing Aero Commander have been assigned.

Supplies of water, food, blankets, etc. will be arriving via National Guard C130 and UH-60 Black Hawk helicopters.

Three hospital based medical helicopters (one from Lincoln and two from Omaha,) have been contracted by FEMA to evacuate the patients from Beatrice, but weather has delayed their response.

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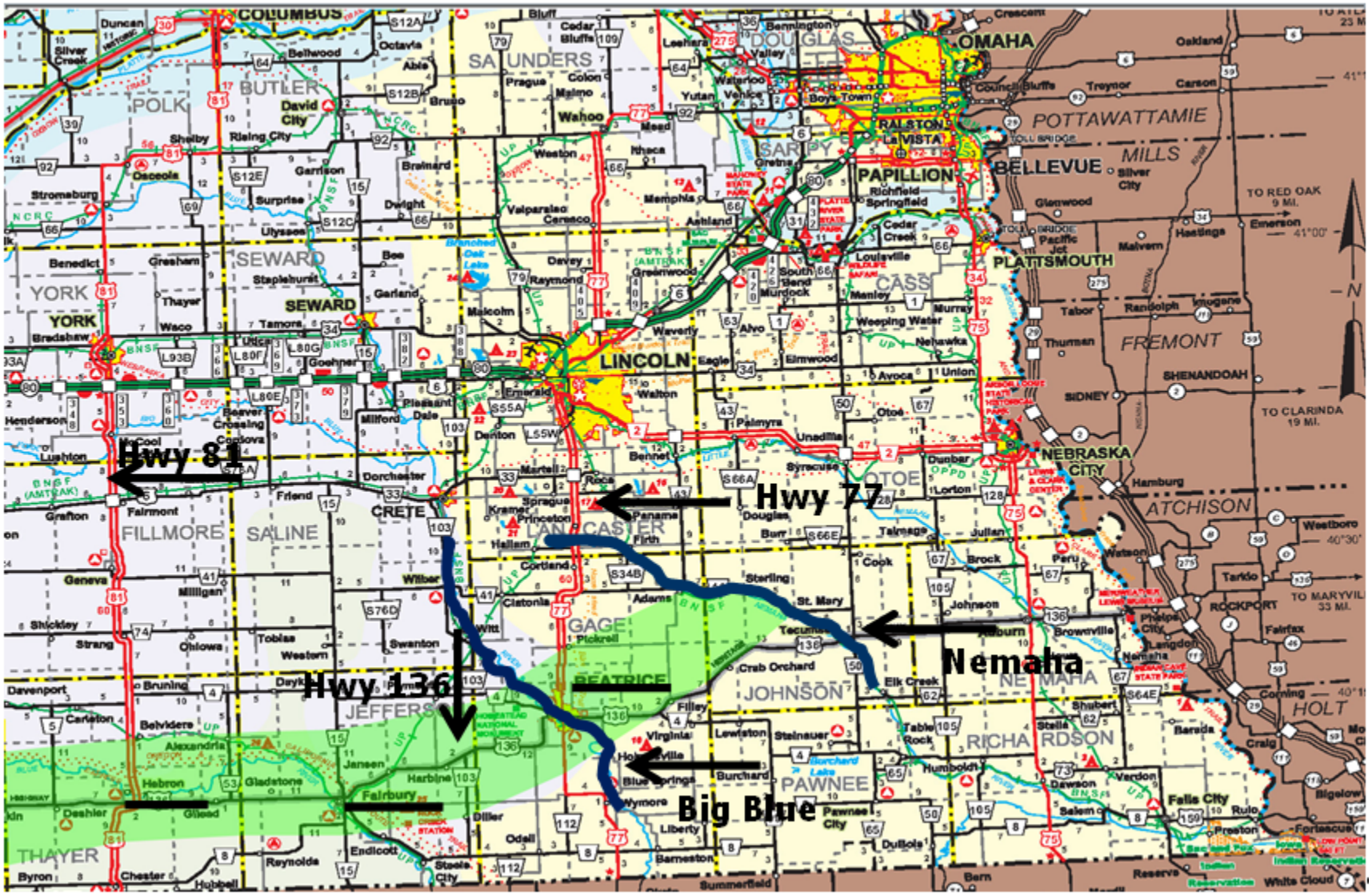
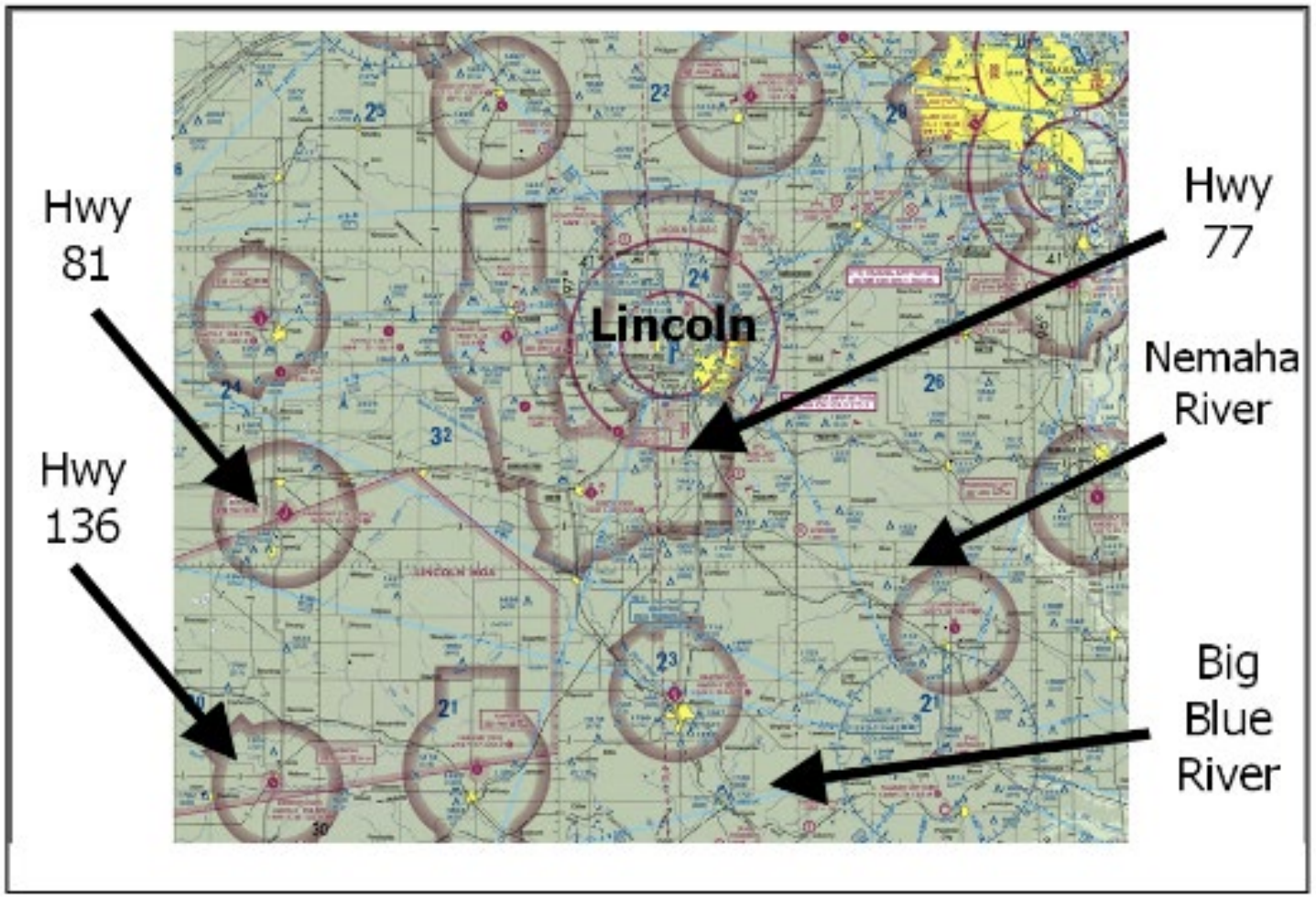
Activity 6.1: Capstone Activity Reference Maps (2)




Hwy
81
Hwy
136
Lincoln
Hwy
77
Nemaha
River
Big
Blue
River

Activity 6.1 Capstone Activity Questions

Activity 6.1 Questions

1. Using your group's aeronautical sectional chart, identify locations for a fixed wing base and two helibases; determine the latitude and longitude for each and write them on the easel pad. Explain why you chose these locations and describe what considerations came into play in making your decision.

2. Identify and list other potential hazards that may exist, such as military training routes, power lines, a location between two airports indicating local traffic, etc.

3. List the issues you must consider when dealing with the contracted hospital-based medical helicopters.

4. Identify and list any other air assets that you believe you need for the scenario.

5. Determine the center point, radius, and rationale for a TFR.

6. Using Handout 2-2: FEMA Resource Typing Matrix for Rotary Wing Search and Rescue (SAR), determine the type of helicopter(s) required to complete the missions identified in the scenario and write them out.

_____

_____

_____

_____

7. Write down the steps for dealing with TFR intrusions.

_____

_____

_____

_____

Unit 7: Course Summary, Closeout, and Evaluation

STUDENT MANUAL

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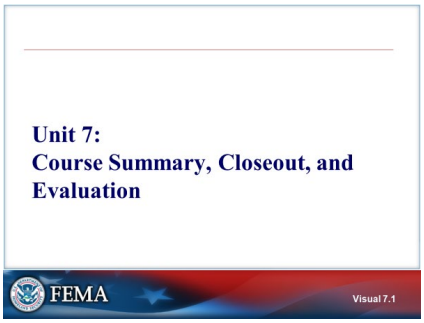


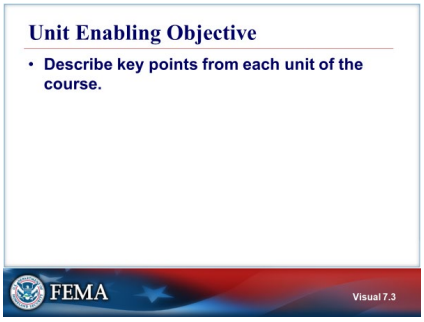
Visual 7.1

UNIT 7: COURSE SUMMARY, CLOSEOUT, AND EVALUATION

Visual 7.2

UNIT TERMINAL OBJECTIVE

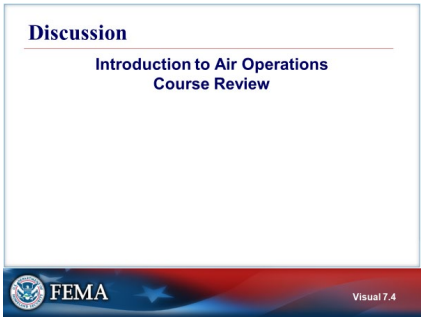
Demonstrate mastery of the key concepts presented in the course.



Visual 7.3

UNIT ENABLING OBJECTIVE

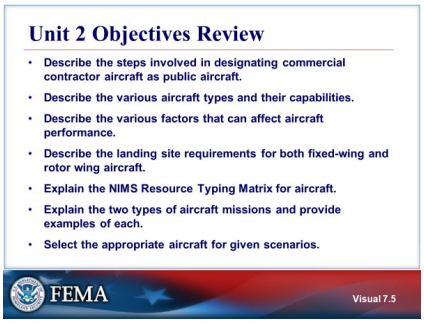
Describe key points from each unit of the course.



Visual 7.4

DISCUSSION

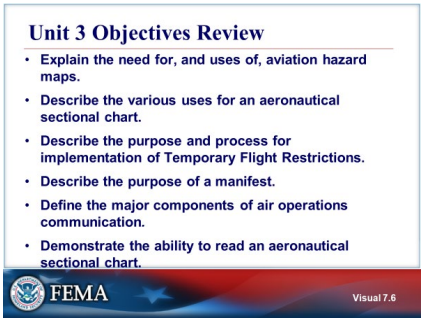
The following visuals provide a general overview of each unit's objectives in Units 2 through 5.



Visual 7.5

UNIT 2: OBJECTIVES REVIEW

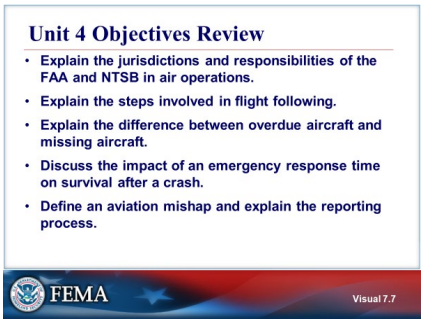
- What are the steps involved in designating commercial contractor aircraft as public aircraft?
- What are the various aircraft types and their capabilities?
- What are some factors that can affect aircraft performance?
- What are some considerations for determining landing sites for both fixed-wing aircraft and helicopters?
- Explain the NIMS Resource Typing Matrix for aircraft.
- What are the two types of aircraft missions and examples of each?
- Explain how you selected the appropriate type of aircraft for the scenario.



Visual 7.6

UNIT 3: OBJECTIVES REVIEW

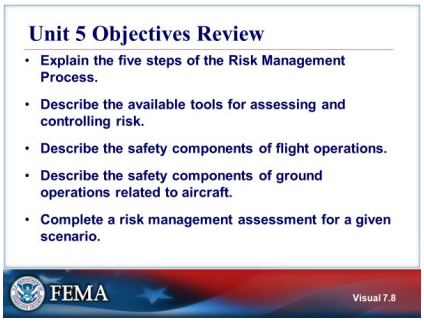
- Explain why you would need and how you would use an aviation hazard map.
- What are some of the uses for an aeronautical sectional chart?
- What steps do you take when there is an intrusion on a Temporary Flight Restriction?
- What is the purpose of a manifest?
- What are the major components of air operations communication?
- What are some key points involved in reading an aeromedical sectional chart?



Visual 7.7

UNIT 4: OBJECTIVES REVIEW

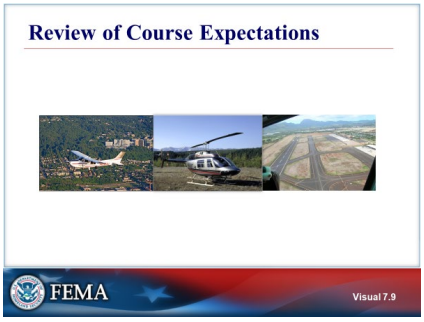
- What are some areas over which the FAA has jurisdiction?
- What are some areas over which the NTSB has jurisdiction?
- What are the steps involved in flight following?
- What is the difference between overdue and missing aircraft?
- What is the impact of emergency response time on survival after a crash?
- What is the process for reporting an aviation mishap?



Visual 7.8

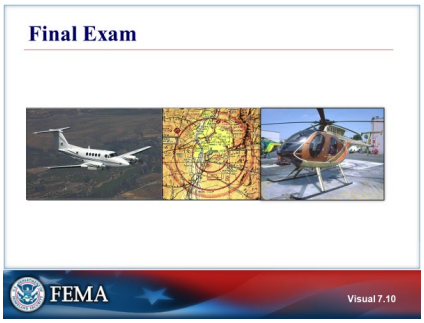
UNIT 5: OBJECTIVES REVIEW

- What are the five steps of the risk management process?
- What are some of the risk management tools?
- What are some of the safety components related to flight operations?
- What are some of the safety components related to aircraft during ground operations?
- What are some of the key considerations in completing the risk assessment for the scenario?



Visual 7.9

REVIEW OF COURSE EXPECTATIONS



Visual 7.10

FINAL EXAM

END OF COURSE