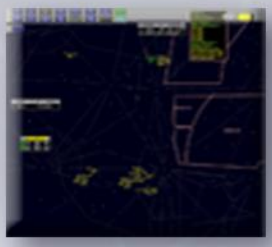
FAA Lesson Plan



En Route Stage 4
Radar Controller Training

Instructor

Radar Emergencies
Lesson 12

55055
V.1.06

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LESSON PLAN DATA SHEET

COURSE NAME:	RADAR CONTROLLER TRAINING
COURSE NUMBER:	55055
LESSON TITLE:	RADAR EMERGENCIES
DATE REVISED:	2014-04
VERSION:	V.1.06
REFERENCES:	JO 7110.65V, Air Traffic Control; JO 7110.310B, ADS-B ATC Services at ARTCCs Using ERAM; JO 7210.3Y, Facility Operation and Administration; JO 7610.4S, Special Operations; Aeronautical Information Manual (AIM); TI 6110.100, En Route Automation Modernization (ERAM) Air Traffic Manual (ATM): R-Position User Manual; TI 6110.101 En Route Automation Modernization (ERAM) Air Traffic Manual (ATM): RA-Position User Manual; TI 6110.107, Full ERAM Outage Job Aid; 14 CFR Part 91.185, IFR operations: Two-way radio communications failure
HANDOUTS:	NONE
EXERCISES:	NONE
END-OF-LESSON TEST:	YES *(REFER TO 55055-ELT12.PDF)*
PERFORMANCE TEST:	NONE
MATERIALS:	
OTHER PERTINENT INFORMATION:	THIS LESSON IS BASED ON ERAM BUILD EAC1500. THE LESSON HAS BEEN REVIEWED AND REFLECTS CURRENT ORDERS AND MANUALS AS OF APRIL 2014.

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INTRODUCTION

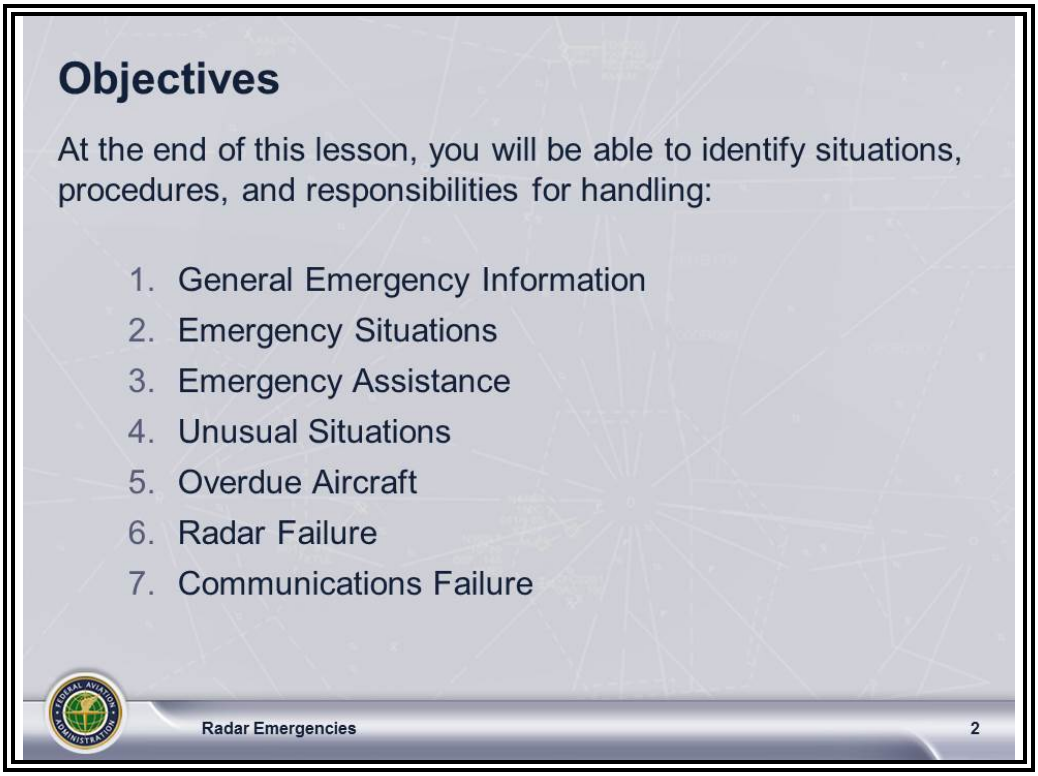
Knowledge of the basic procedures for handling emergency situations is necessary for you to be able to provide pilots with the proper information and assistance.

Purpose

In this lesson we will discuss guidelines for specific procedures for emergency situations.

INTRODUCTION *(Continued)*

Objectives



☞ ***NOTE:*** *Review the lesson objectives.*

GENERAL EMERGENCY INFORMATION

Determination
JO 7110.65,
par. 10-1-1

⊙ When an emergency exists or is imminent:

- Pursue the most appropriate course of action.
- Conform as near as possible to instructions in FAA Order JO 7110.65.

⊙ An emergency can be classified as either a **distress** or **urgency** condition.

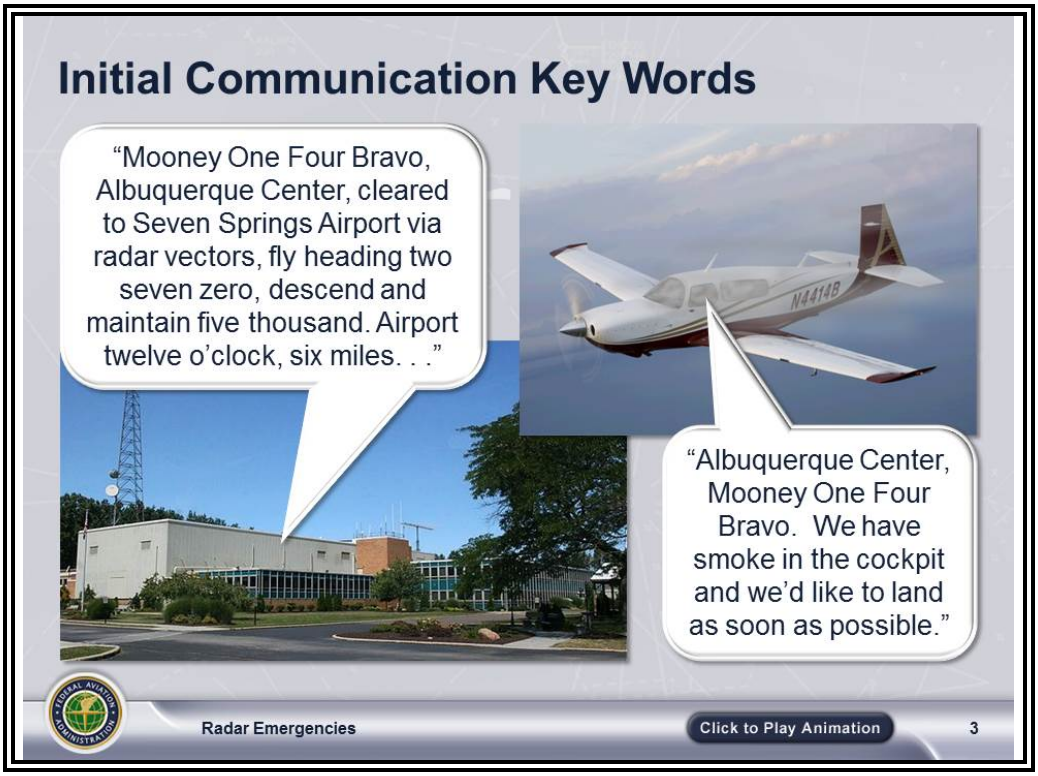
Emergency Definitions
JO 7110.65,
Pilot/Controller Glossary

📖 **Distress** is a condition of being threatened by serious and/or imminent danger and of requiring immediate assistance.

📖 **Urgency** is a condition of being concerned about safety and of requiring timely but not immediate assistance. A potential distress condition.

GENERAL EMERGENCY INFORMATION *(Continued)*

Initial Communication Key Words
JO 7110.65, par. 10-1-1



Click 2 times to animate.

- ⊙ "MAYDAY" - repeated three times by the pilot
  - Distress condition
- ⊙ "PAN-PAN" - repeated three times by the pilot
  - Urgency condition
- ⊙ If "MAYDAY" or "PAN-PAN" is not used, and you are unsure that a situation constitutes an emergency:
  - Handle as though it is an emergency.

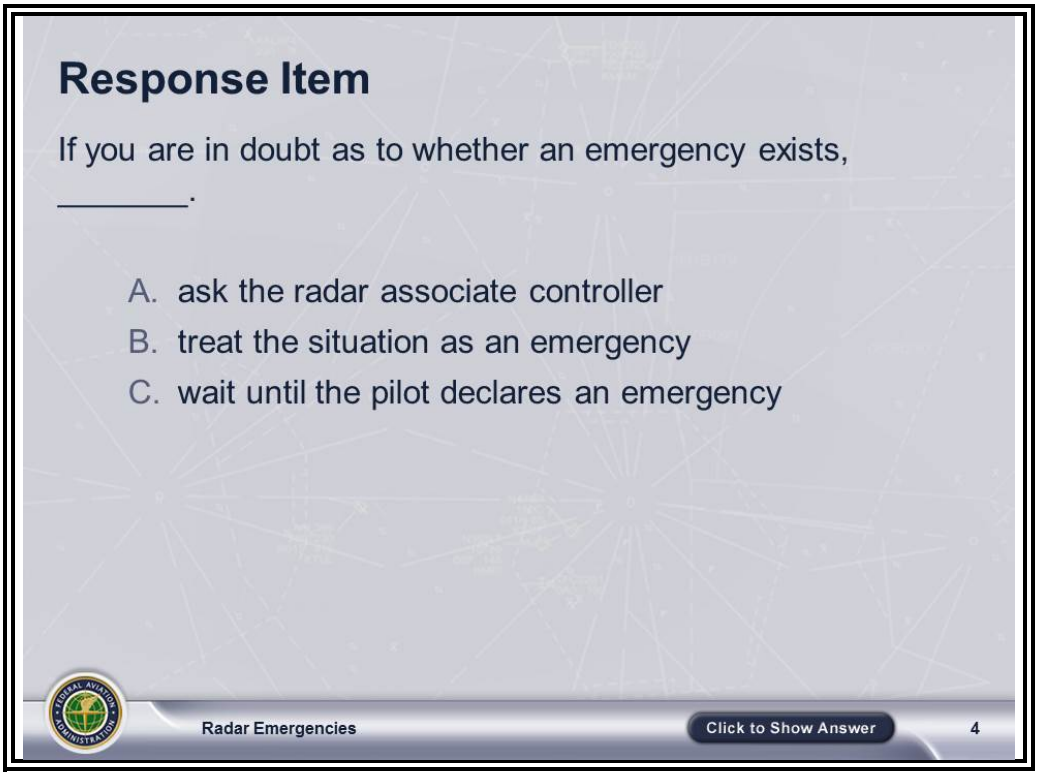
Obtaining Information
JO 7110.65, par. 10-1-2

- ⊙ Obtain enough information to handle the emergency intelligently.
- ⊙ Base your decision as to what type of assistance is needed on information and requests from the pilot, who is authorized by FAR Part 91 to determine course of action.

Review
JO 7110.65,
par. 10-1-1

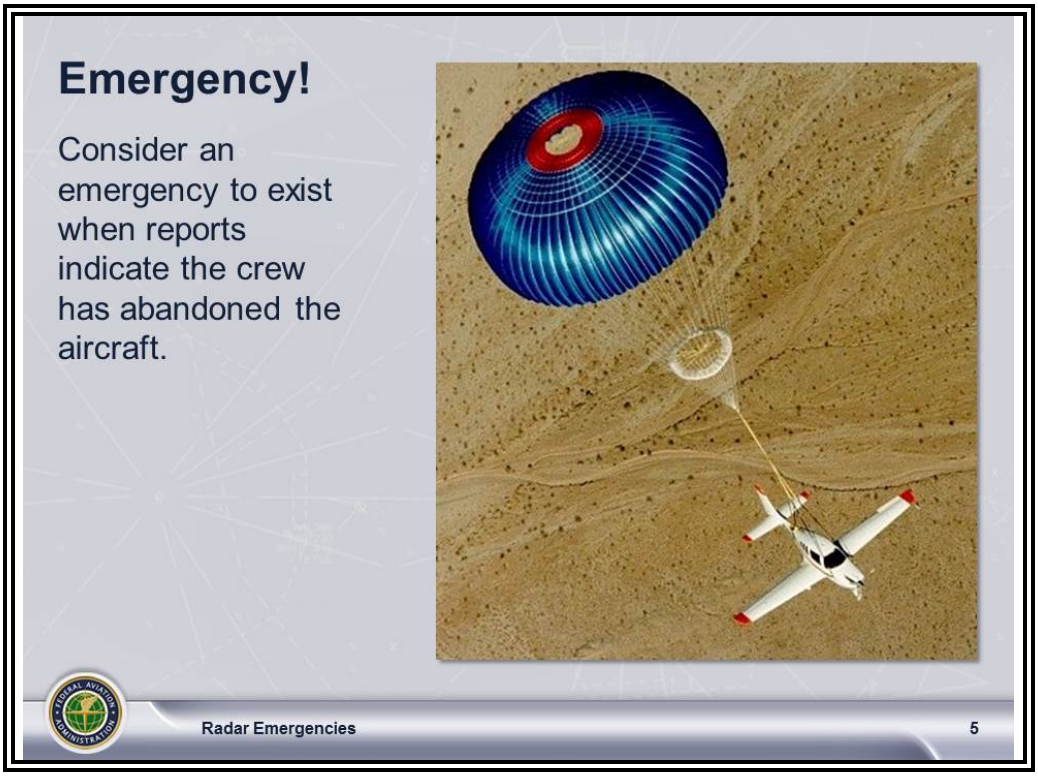
◈**QUESTION:** What phrase might you hear if a pilot was in distress?

ANSWER: *Mayday, Mayday, Mayday*



SLIDE ANSWER: B

EMERGENCY SITUATIONS



Rescue Coordination Center (RCC) Definition
JO 7110.65, Pilot/Controller Glossary

A **Rescue Coordination Center (RCC)** is a Search and Rescue (SAR) facility equipped and manned to coordinate and control SAR operations in an area designated by the SAR Plan. The U.S. Coast Guard and the U.S. Air Force have responsibility for the operation of RCCs.

Considerations
JO 7110.65, par. 10-2-5

- Consider an emergency to exist and inform Rescue Coordination Center (RCC) or ARTCC when any of the following occurs:
  - Emergency is declared by:
    - Pilot
    - Facility personnel
    - Officials responsible for operation of the aircraft
  - An unexpected loss of radar contact and radio communications with any IFR or VFR aircraft.
  - Reports indicate:
    - Forced landing has been made or is imminent
    - Crew has abandoned the aircraft or is about to do so

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EMERGENCY SITUATIONS *(Continued)*

Considerations (Cont'd)
JO 7110.65, par. 10-2-5; TI 6110.100, par. 4.3.9

- Emergency radar beacon response has been received.
  - Code 7700 causes EMRG to blink in Field E of the data block or causes a LDB to blink.
- Intercept or escort aircraft services are required.
- Need for ground rescue appears likely.
- Emergency Locator Transmitter (ELT) signal is heard or reported.

Providing Assistance to Aircraft in Distress
JO 7110.65, par. 10-1-3

⊙ When the pilot requests or you deem necessary, enlist the services of:

- Available radar facilities
- Military
- Federal Communications Commission (FCC) and their emergency services and facilities

FAA Responsibilities
JO 7110.65, pars. 10-1-4, 10-2-10,10-3-3

⊙ ARTCCs (centers) serve as focal point for:

- Collecting information
- Coordinating with Search and Rescue (SAR)
- Conducting communications search, including distributing Alert Notices (ALNOTs) concerning:
  - Overdue/missing aircraft
  - Aircraft in emergency situations occurring in their respective areas
  - Aircraft on a combination VFR/IFR flight plan or an airfiled IFR flight plan and 30 minutes have passed since the pilot requested IFR clearance and neither communications nor radar contact can be established with it. For SAR purposes, these aircraft are treated the same as IFR aircraft.
  - Overdue/missing SVFR

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EMERGENCY SITUATIONS *(Continued)*

FAA Responsibilities (Cont'd)
JO 7110.65, pars. 10-1-4, 10-2-10,10-3-3

Click 2 times to animate.

- ARTCC must be responsible for receiving and relaying all pertinent ELT signal information to appropriate authorities.
- FSSs serve as central points for collecting and disseminating information on overdue/missing aircraft which is not on an IFR flight plan.
  - Notifying the center about VFR aircraft emergency allows provision for IFR separation, if necessary.
- The facility in communication with aircraft in distress must:
  - Handle emergencies.
  - Coordinate and direct activities of assisting facilities.
    - This facility may transfer responsibility to another facility:
      - → Only if better handling will result

EMERGENCY SITUATIONS *(Continued)*

Controller Responsibilities
JO 7110.65, pars. 10-1-4, 10-2-10

- If you receive information about an aircraft in distress:
  - Forward detailed data to the center in whose area the emergency exists.
- When a foreign air carrier is involved:
  - Notify ARTCC serving departure or destination airport when either point is in the U.S.
    - For relay to aircraft operator
- Before determining if the aircraft in distress requires an escort by another aircraft:
  - Consider whether maneuver takes the aircraft through clouds.
  - Ask pilots if they are familiar with and capable of formation flight.
    - Do not allow aircraft to join up in formation during emergency conditions, unless pilots:
      - → Are familiar with and capable of formation flight
      - → Can communicate with each other and have visual contact with each other
    - If aircraft that are not designated SAR need to get closer to one another than radar separation standards allow:
      - → The maneuver must be accomplished visually by aircraft involved.

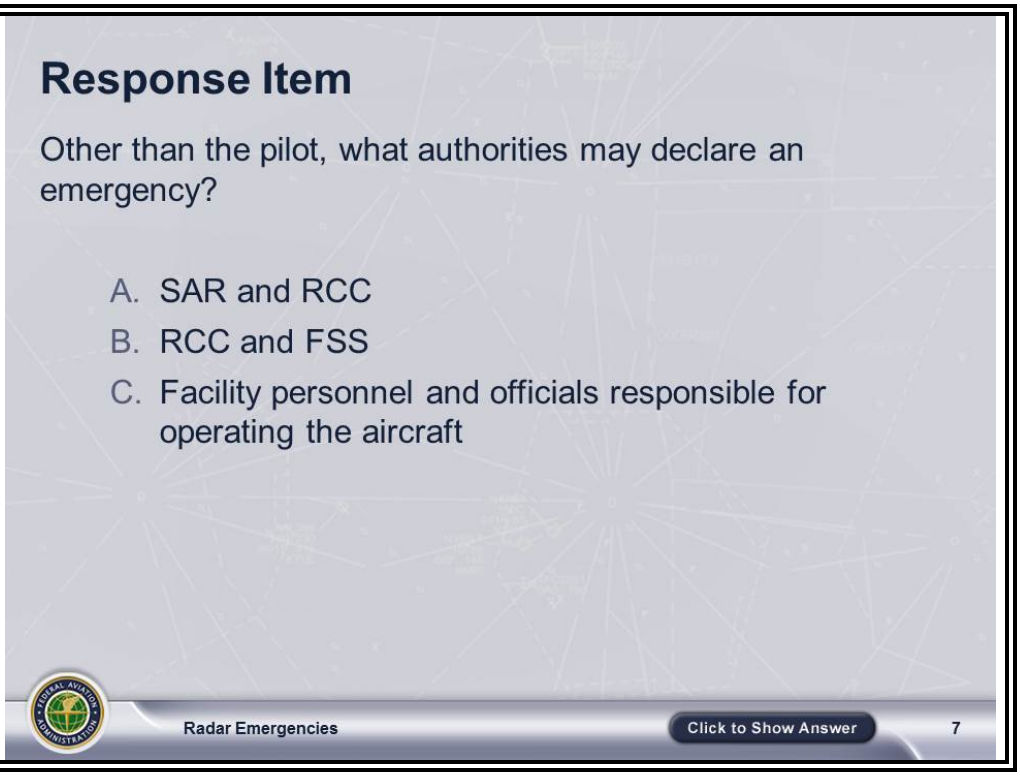
EMERGENCY SITUATIONS *(Continued)*

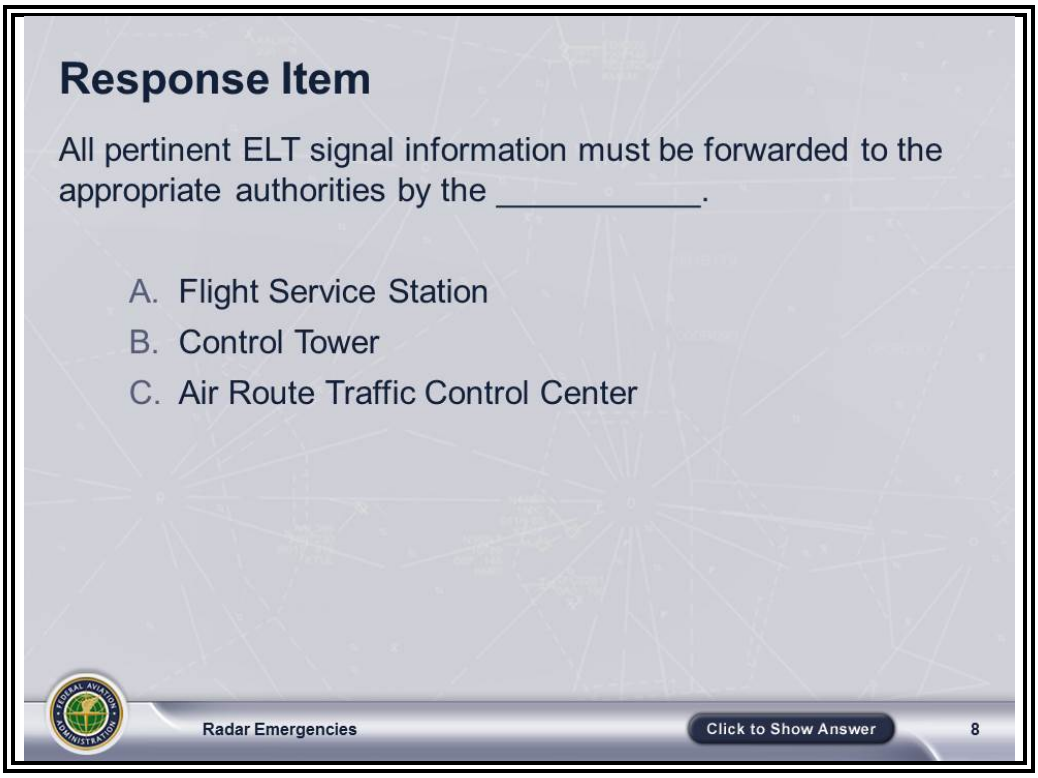
Information to be Forwarded to the RCC
JO 7110.65, par. 10-3-3

⊙ For overdue IFR aircraft, or any aircraft in emergency status, the ARTCC must alert the RCC and forward the following information, as available:

- Facility and person calling
- Flight plan, including aircraft color
- Last transmission information, including the time, frequency, and person receiving the transmission
- Last position report and how it was determined
- Action taken and proposed by the reporting facility
- Number of persons on board
- Fuel status
- Facility working the aircraft, and the frequency
- Last known position, estimated present position, and maximum range based on remaining fuel and airspeed
- Position of other aircraft near aircraft's route of flight, when requested
- Any ELT signal information
- Any other pertinent information

Review





SLIDE ANSWERS: Slide 7=C, Slide 8=C

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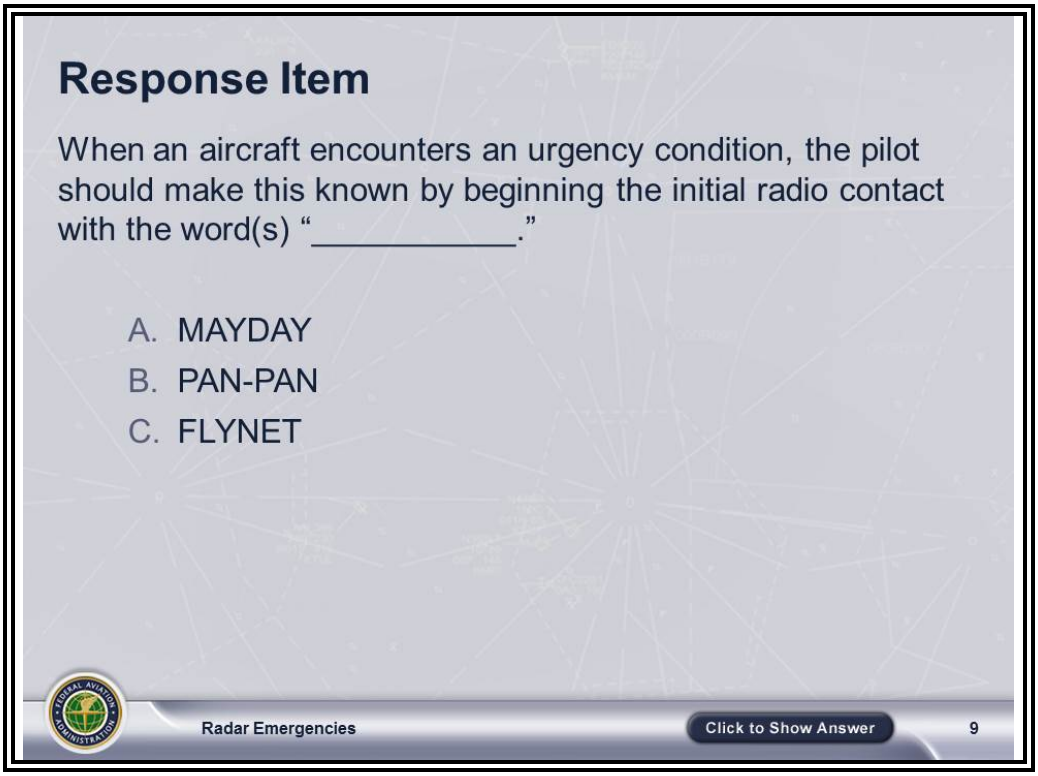
EMERGENCY SITUATIONS *(Continued)*

Review (Cont'd)



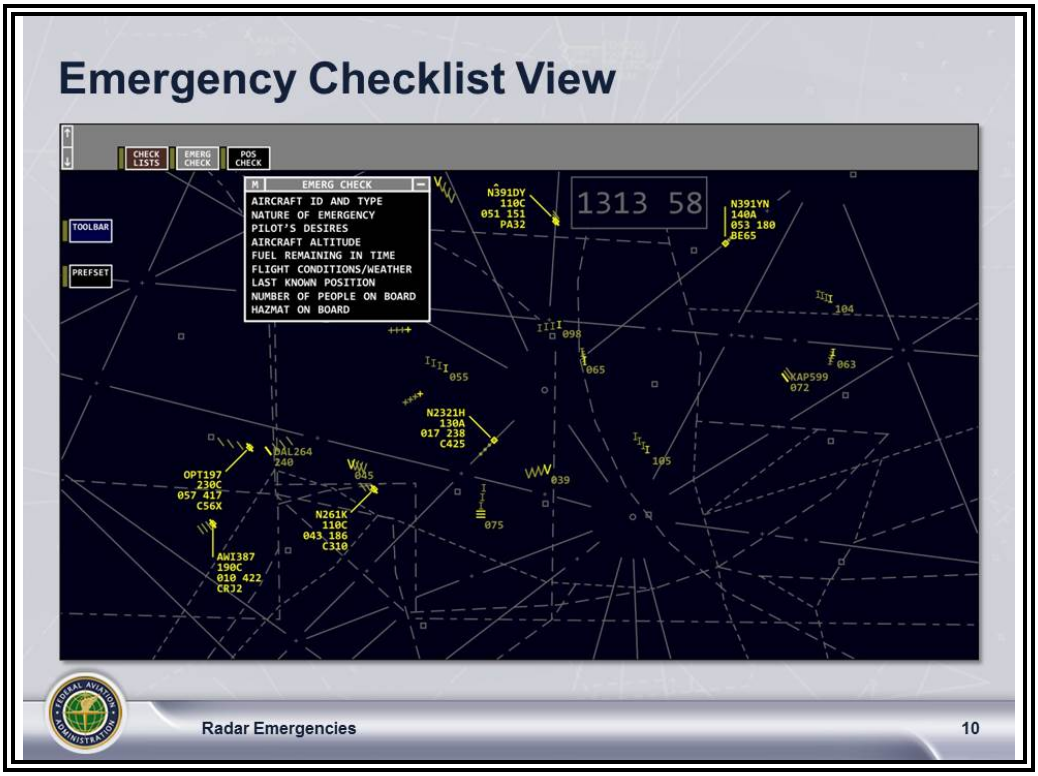
SLIDE ANSWER: B

QUESTION: What does the abbreviation RCC stand for?

ANSWER: *Rescue Coordination Center*

EMERGENCY ASSISTANCE

Information Requirements
JO 7110.65, par. 10-2-1;
TI 6110.100, par. 13.6



- Start providing assistance when enough information has been obtained upon which to act.
- The Emergency Checklist View may be displayed by left/middle-clicking the EMERG CHECK button on the Check Lists toolbar menu.
- Minimum information requirements:
  - Aircraft identification and type
  - Nature of emergency
  - Pilot's desires

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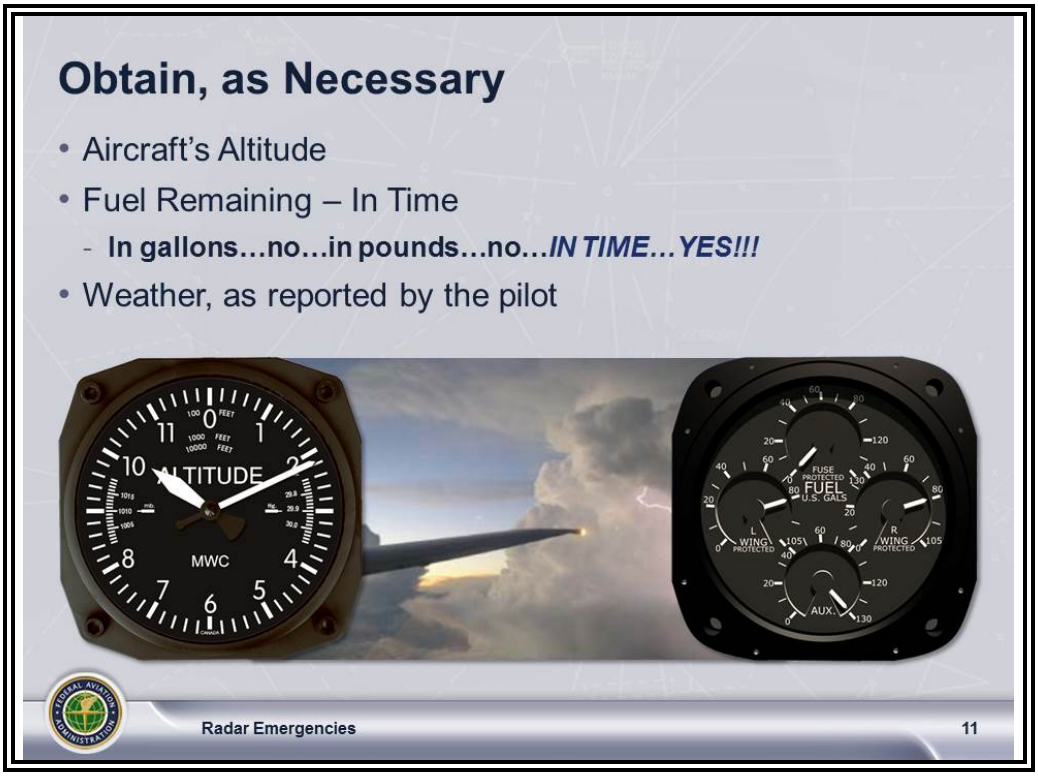
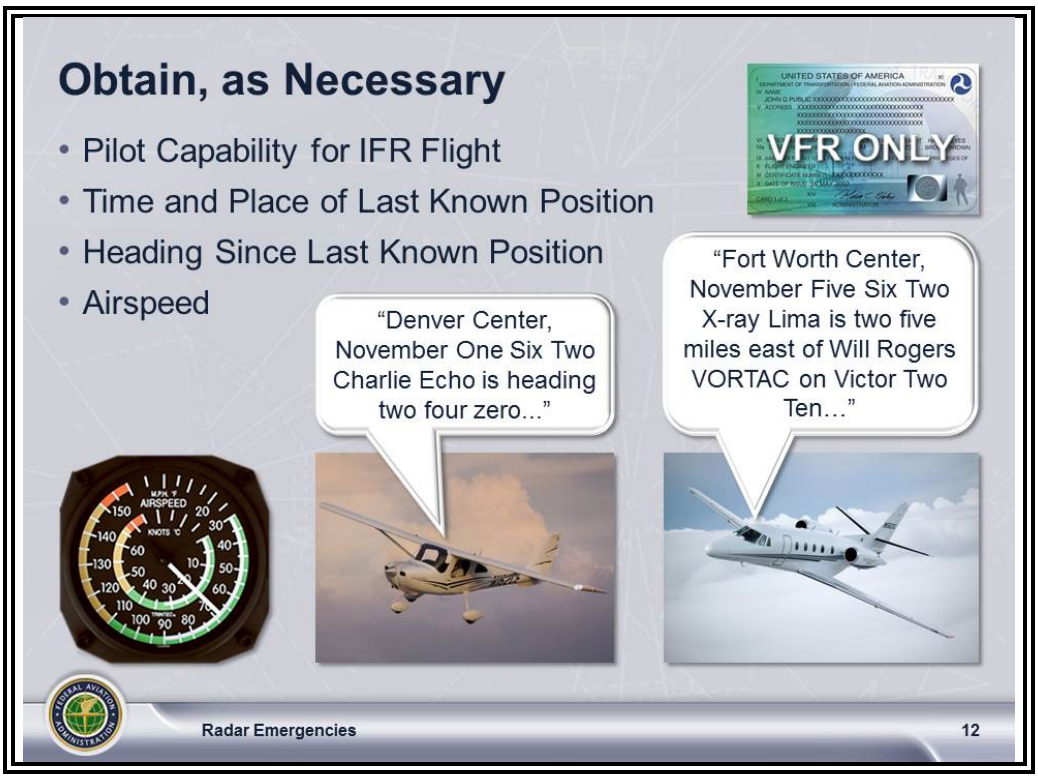
EMERGENCY ASSISTANCE *(Continued)*

Information Requirements (Cont'd)
JO 7110.65, par. 10-2-1; TI 6110.100, par. 13.6





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Information Requirements (Cont'd)
JO 7110.65, par. 10-2-1; TI 6110.100, par. 13.6

⊙ After initiating action, obtain the following from the pilot, as necessary:

- Altitude
- Fuel Remaining in time
- Pilot reported weather
- Pilot capability for IFR flight
- Time and place of last known position
- Heading since last known position
- Airspeed
- Navigation equipment capability
- NAVAID signals received
- Visible landmarks
- Aircraft color

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EMERGENCY ASSISTANCE *(Continued)*

Information Requirements (Cont'd)
JO 7110.65, par. 10-2-1; TI 6110.100, par. 13.6

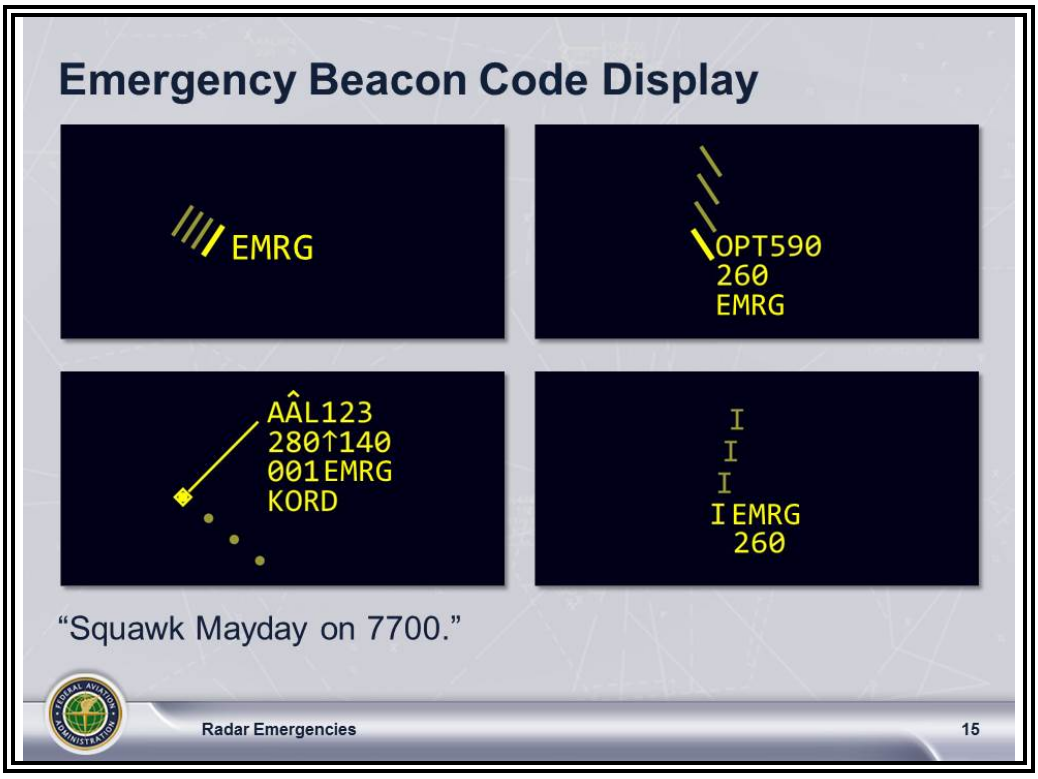
- Obtain, as necessary:
  - Number of people on board
  - Point of departure and destination
  - Emergency equipment on board
- Do **not** request additional information from military fighter aircraft that are:
  - At a low altitude
  - On approach
  - On initial departure climb-out
  - On a low level route
- Request aircraft position if:
  - Pilot has not given this information
  - Aircraft is not visually sighted or displayed on radar

EMERGENCY ASSISTANCE *(Continued)*

Frequency Changes
JO 7110.65, par. 10-2-2

- Keep aircraft on initial contact frequency.
  - Change frequencies only when there is a valid reason.
- Emergency frequencies:
  - 121.5 MHz (VHF)
  - 243.0 MHz (UHF)

Emergency Code Assignment
JO 7110.65, par. 5-2-7;
TI 6110.100, par. 4.3.4



- Assign code 7700 to aircraft when pilot declares emergency and aircraft is **not** radar-identified.

✈ **Phraseology**

- "SQUAWK MAYDAY ON 7700."

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EMERGENCY ASSISTANCE *(Continued)*

Emergency Code Assignment (Cont'd)
JO 7110.65, par. 5-2-7; TI 6110.100, par. 4.3.4

⊙ After radar contact is established, request aircraft to change from 7700 to appropriate code.

- Signifies that the aircraft is identified and under ATC control

✈ **Phraseology**

"RADAR CONTACT (position). IF FEASIBLE, SQUAWK (code)."

- Exceptions:
  - Single-piloted helicopters
  - Single-piloted turbojets

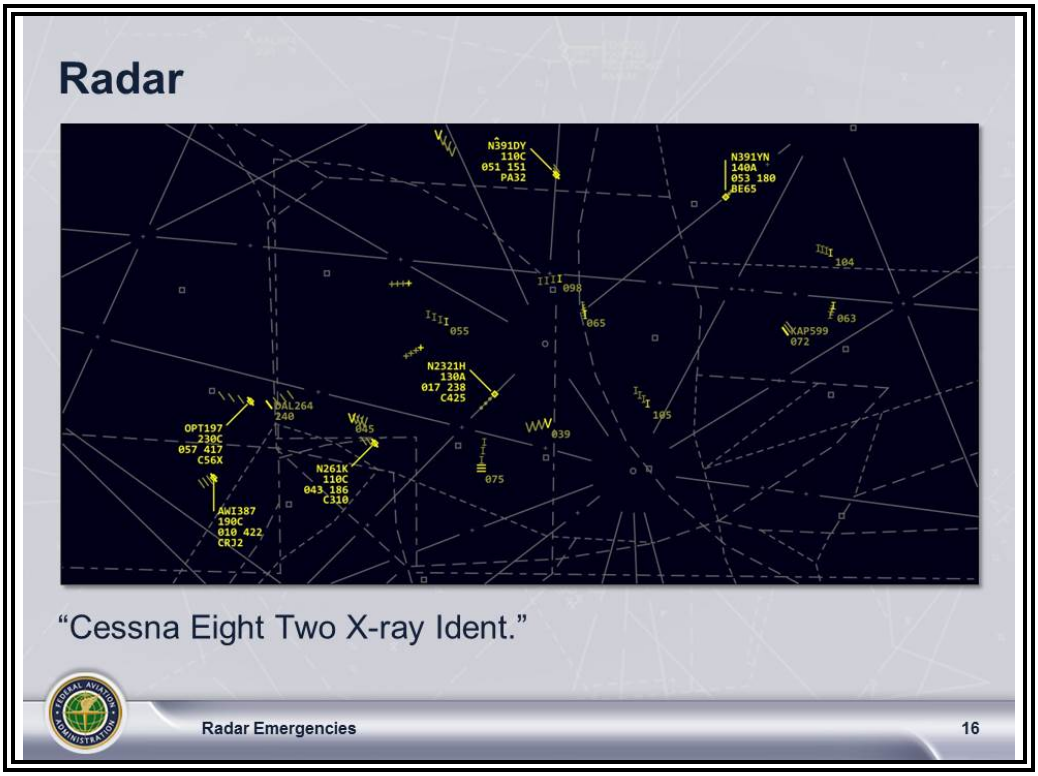
Military Fighter-Type Aircraft
JO 7110.65, par. 10-1-7

⊙ Due to the design and complexity of military fighter-type aircraft, to the extent possible during an emergency (especially at low altitudes):

- Avoid radio frequency and transponder code changes.
- Keep radio transmissions to a minimum.

EMERGENCY ASSISTANCE *(Continued)*

Aircraft Orientation
JO 7110.65, pars. 5-3-2, 5-3-3, 10-2-3;
TI 6110.100, par. 4.1



- Orient aircraft by the most appropriate means, including:
  - Radar
    - Using any radar identification method
  - NAVAIDs

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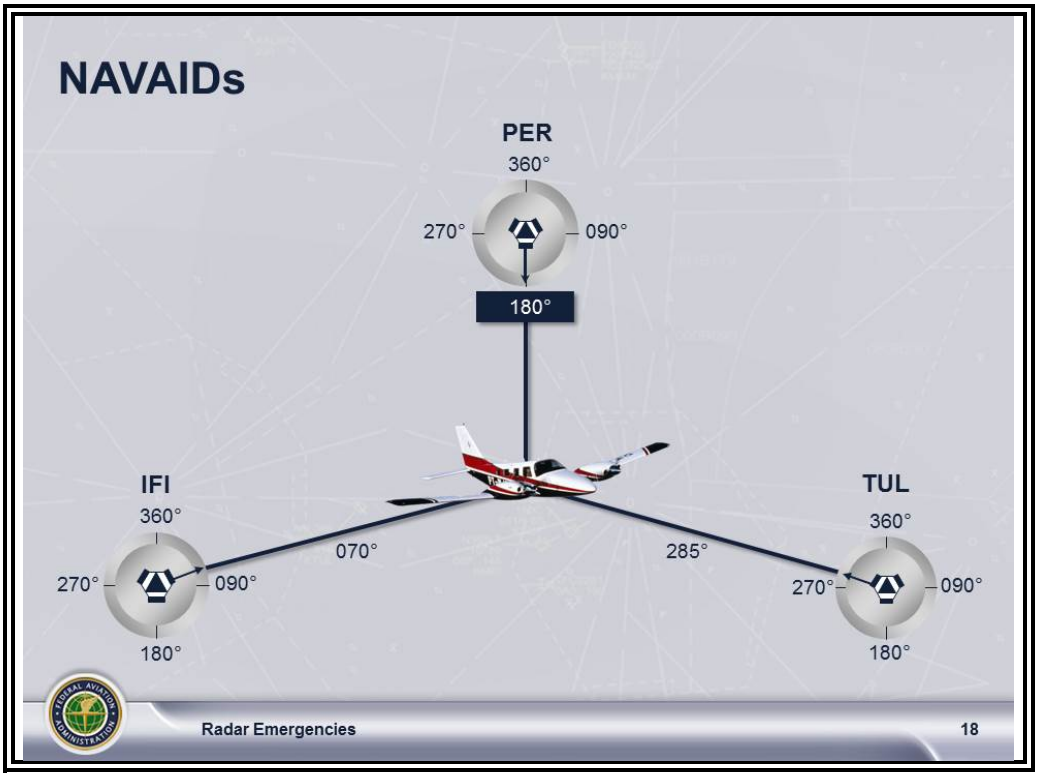
EMERGENCY ASSISTANCE *(Continued)*

Aircraft Orientation (Cont'd)
JO 7110.65, pars. 5-3-2, 5-3-3, 10-2-3



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EMERGENCY ASSISTANCE *(Continued)*

Aircraft Orientation (Cont'd)
JO 7110.65, pars. 5-3-2, 5-3-3, 10-2-3

- Pilotage:
  - Gives visual reference to aid you

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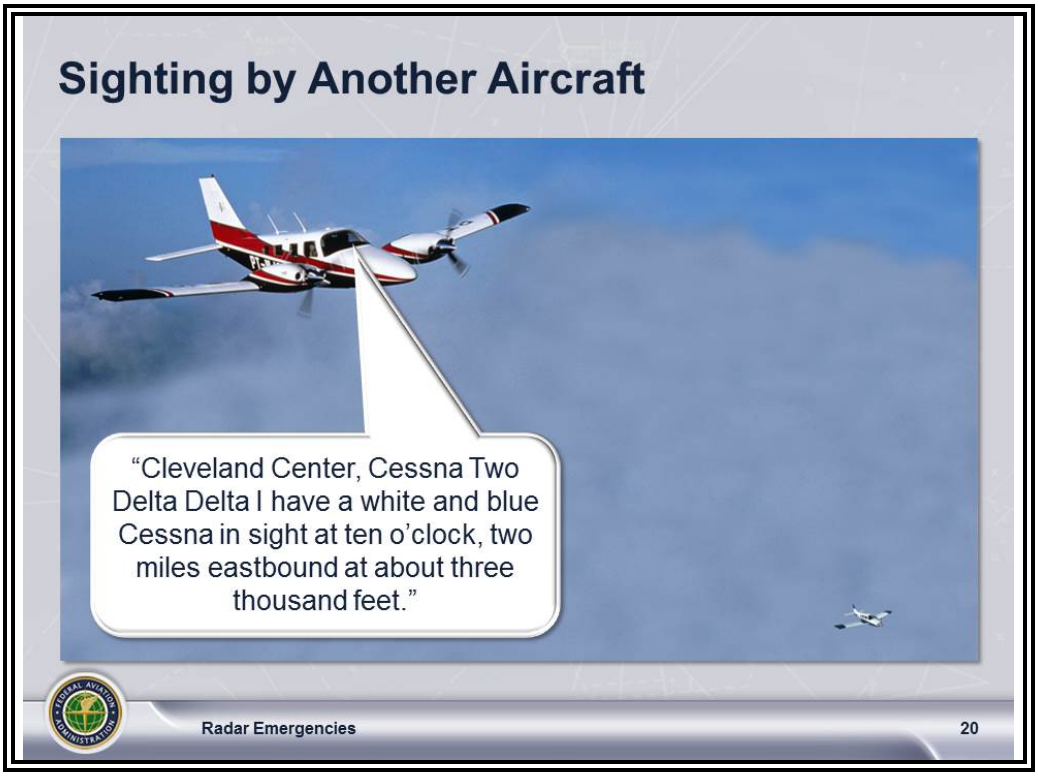
EMERGENCY ASSISTANCE *(Continued)*

Aircraft Orientation (Cont'd)
JO 7110.65, pars. 5-3-2, 5-3-3, 10-2-3



- Sighting by other aircraft

NOTE: In some cases, you can request other aircraft to assist in locating a lost aircraft.

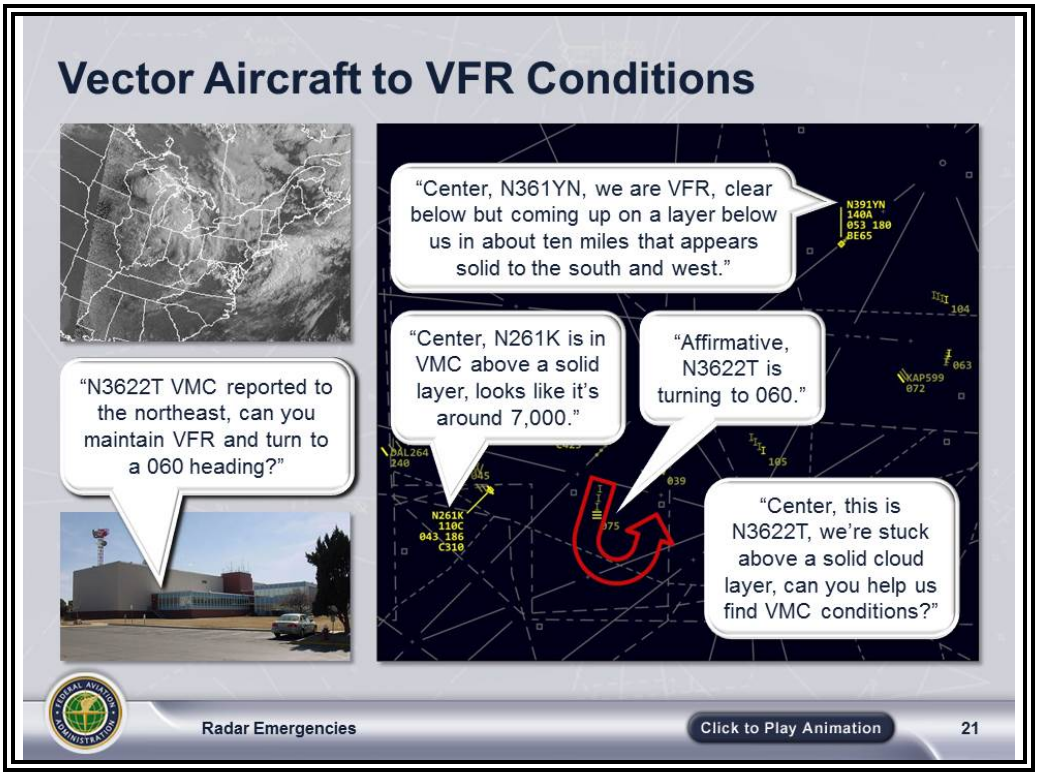
Improved Reception
JO 7110.65, par. 10-2-4

⊙ When considered necessary, and if weather and circumstances permit, recommend aircraft maintain or increase altitude to improve reception for:

- Communications
- Radar

EMERGENCY ASSISTANCE *(Continued)*

Radar Assistance Techniques
JO 7110.65, par. 10-2-9



Click 10 times to animate.

⊙ When providing radar assistance to a pilot not IFR qualified, use the following techniques to the extent possible:

- Avoid radio frequency changes.
  - Except when necessary

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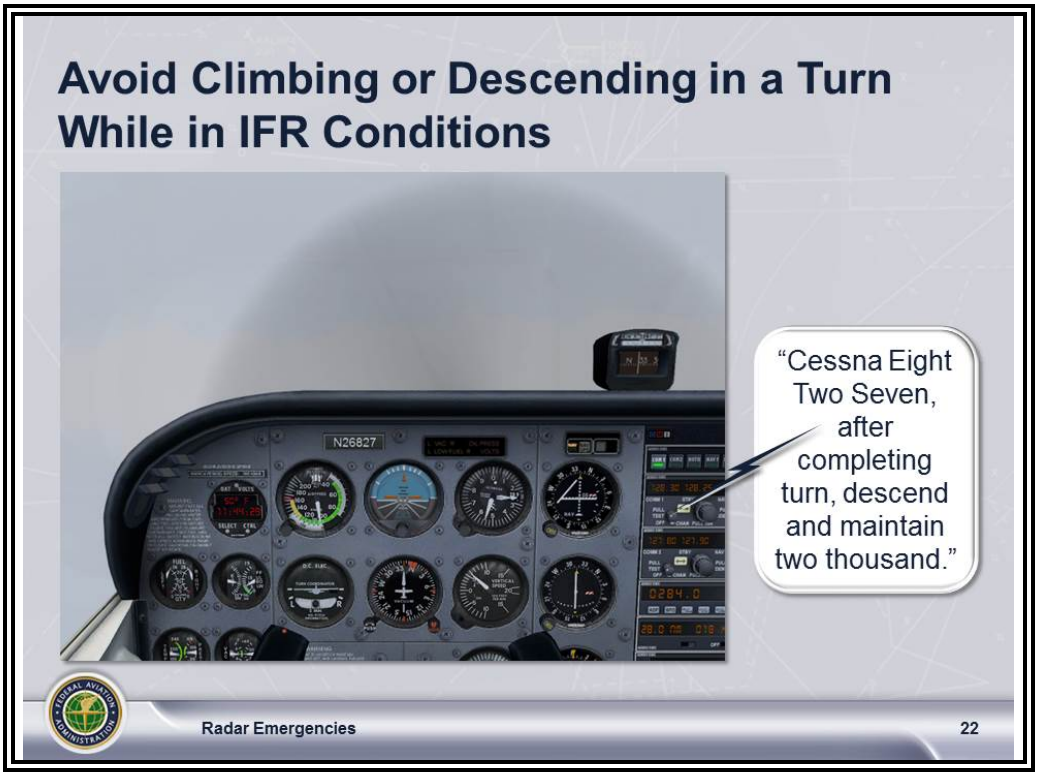
EMERGENCY ASSISTANCE *(Continued)*

Radar Assistance Techniques (Cont'd)
JO 7110.65, par. 10-2-9



- Make turns while aircraft is in VFR conditions.
  - Allows aircraft to fly a straight course while in IFR conditions
- Have the pilot lower landing gear and slow to approach speed while in VFR conditions.
- Avoid climbing or descending in a turn while in IFR conditions.
- Avoid abrupt maneuvers.
- Vector aircraft to VFR conditions.
- On Mode C VFR aircraft:
  - Ensure E-MSAW is activated.

EMERGENCY ASSISTANCE *(Continued)*

Emergency Airport Recommend-ation
JO 7110.65, par. 10-2-15

⊙ Consider the following factors when recommending an emergency airport:

- Remaining fuel in relation to the distance to the airport
- Weather conditions
  - Certain weather phenomena may deserve weighted consideration.
  - Pilot may elect to continue flight to an airport with better weather.
- Airport conditions
- NAVAID status
- Aircraft type
- Pilot's qualification
- Vectoring or homing capability to the emergency airport
- Information derived from any automated emergency airport information source

EMERGENCY ASSISTANCE *(Continued)*

Guidance to Emergency Airport
JO 7110.65, par. 10-2-16

⊙ When necessary, use any of the following to provide guidance to the airport:

- Radar
- Following another aircraft
- NAVAIDs
- Pilotage by landmarks
- Compass headings

EMERGENCY ASSISTANCE *(Continued)*

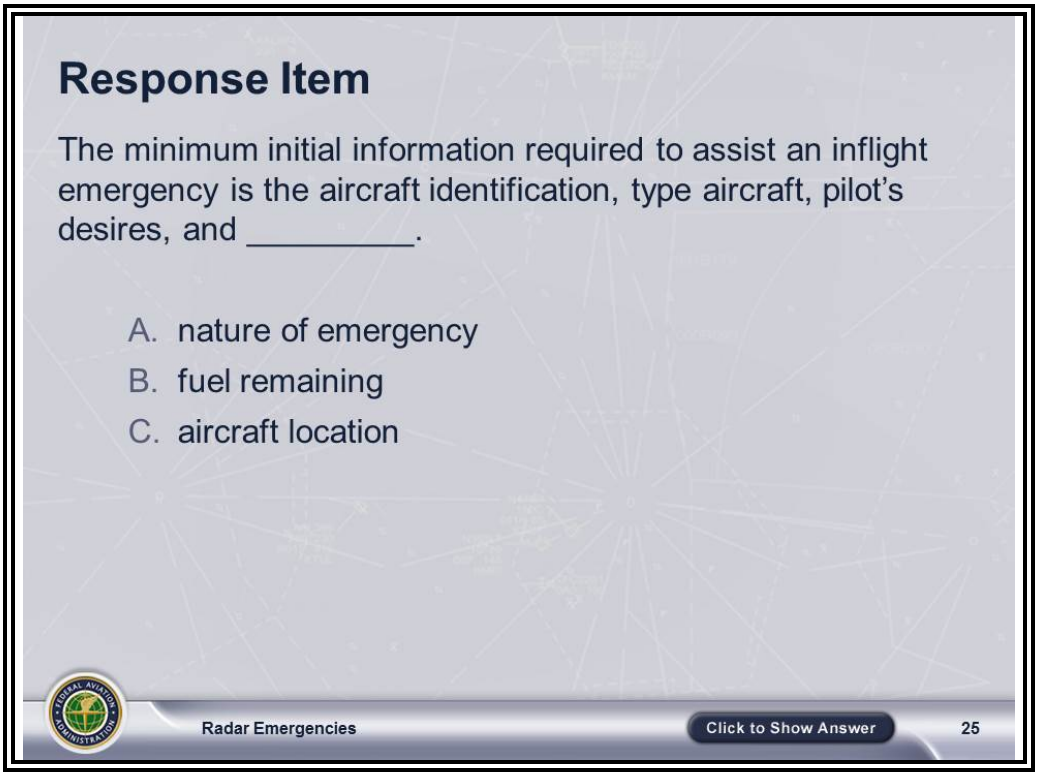
Coordination
JO 7110.65,
par. 10-1-5

Click 2 times to animate.

⊙ Coordinate all efforts possible to assist any aircraft believed to be:

- Overdue
- Lost
- In emergency status

Review



SLIDE ANSWER: A

QUESTION: What are the four recognized methods used to orient or locate lost aircraft?

ANSWER: *Radar, NAVAIDs, pilotage, sighting by other aircraft*

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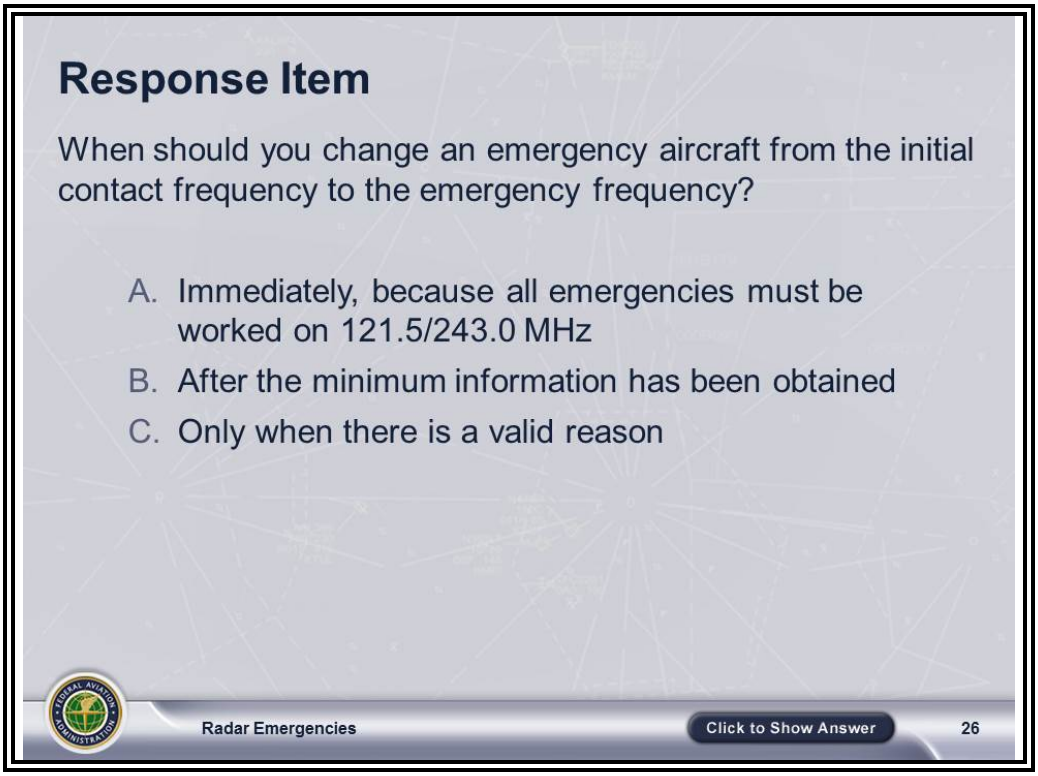
EMERGENCY ASSISTANCE *(Continued)*

Review (Cont'd)



SLIDE ANSWER: C

QUESTION: Name five methods used to provide guidance to an emergency airport.

ANSWER: *Radar, following other aircraft, NAVAIDs, pilotage by landmarks, compass headings*

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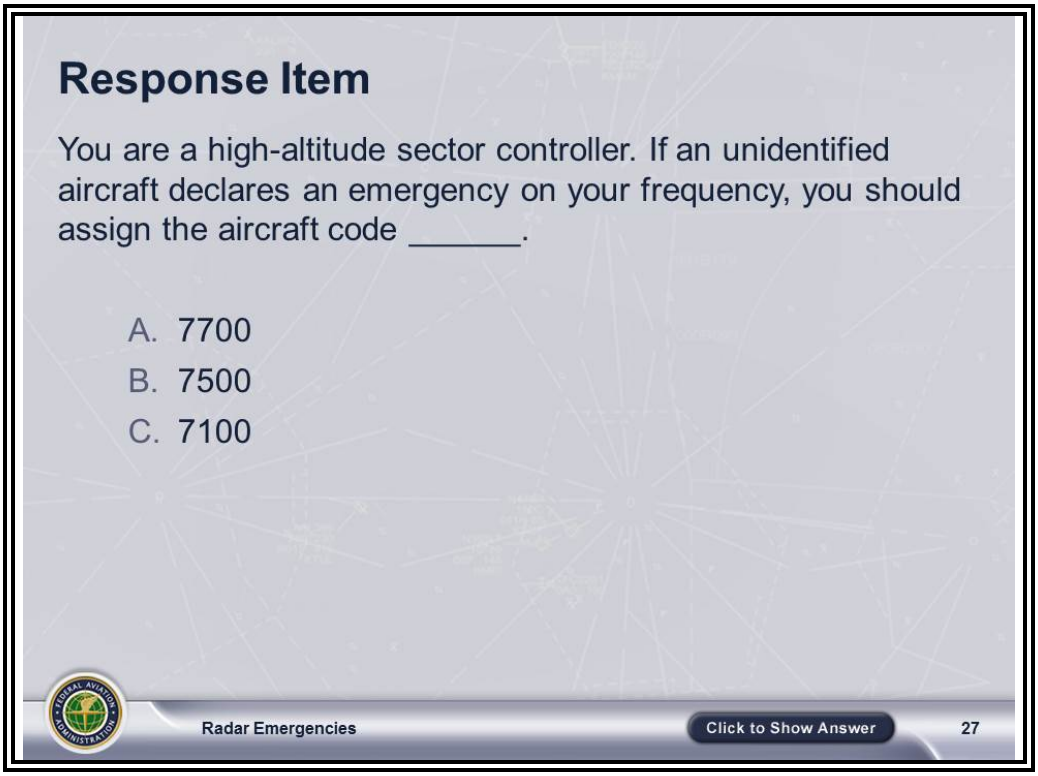
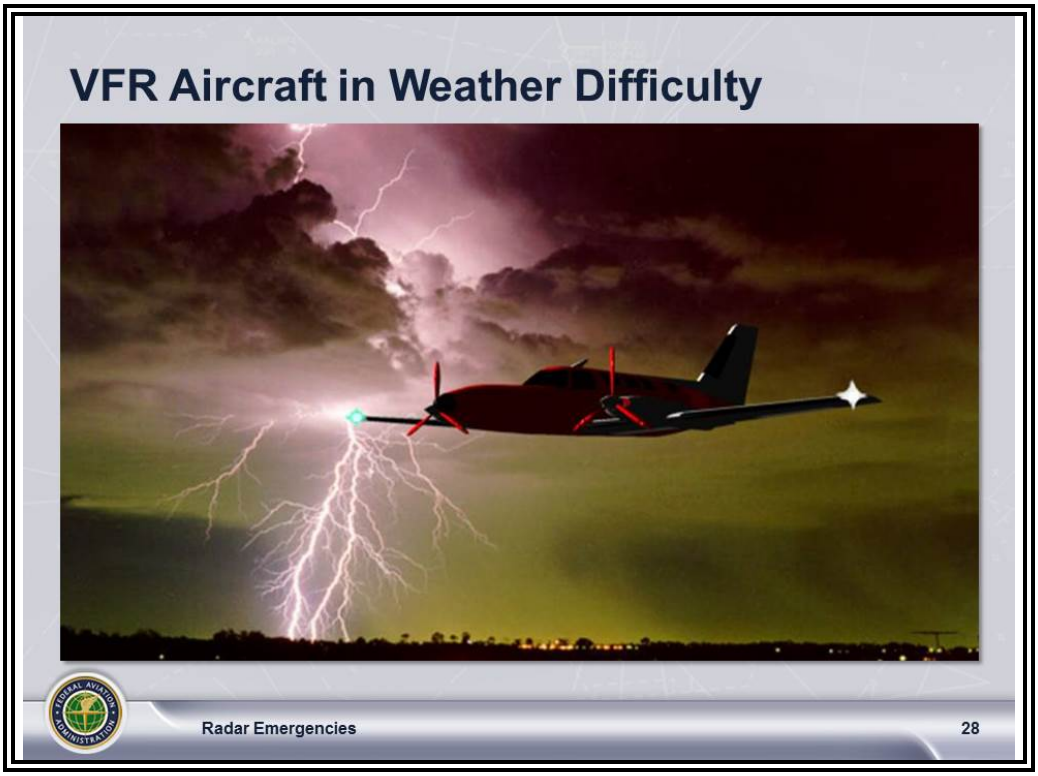
Review (Cont'd)



SLIDE ANSWER: A

VFR Aircraft in Weather Difficulty
JO 7110.65, pars. 10-2-7, 10-2-8



⊙ If VFR aircraft requests assistance when it encounters or is about to encounter IFR weather:

- In your area of jurisdiction
  - Provide assistance.
- Not in your area of jurisdiction
  - Determine the facility best able to provide service.
    - → If a frequency change is necessary, advise the pilot of the reason for the change.
  - Request aircraft to contact the appropriate facility.
  - Advise that facility of the situation.
  - If the aircraft is unable to communicate with appropriate control facility:
    - → Relay information and clearances.

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UNUSUAL SITUATIONS *(Continued)*

VFR Aircraft in Weather Difficulty (Cont'd)
JO 7110.65, pars. 10-2-7, 10-2-8

Click 3 times to animate.

⊙ Provide radar assistance

- If requested

⊙ Determine if the pilot is qualified for and capable of IFR flight.

- Request that the pilot file an IFR flight plan.
- Issue clearance to destination airport.

☞ **NOTE:** The next slide has the identical background to this one, but displays a different dialog.

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UNUSUAL SITUATIONS *(Continued)*

VFR Aircraft in Weather Difficulty (Cont'd)
JO 7110.65, pars. 10-2-7, 10-2-8, 10-2-16

Click 3 times to animate.

⊙ If the pilot is **NOT** qualified for or **NOT** capable of IFR flight:

- Inform pilot of airports where VFR conditions are reported.
- Provide other weather information.
- Ask if he/she will elect to conduct VFR flight to airport.

⊙ If the actions above are not feasible or the pilot declines to conduct VFR flight to another airport, provide radar assistance if the pilot:

- Declares an emergency
- Refuses to declare an emergency and you have determined the exact nature of the radar services the pilot desires

Continued on next page

UNUSUAL SITUATIONS *(Continued)*

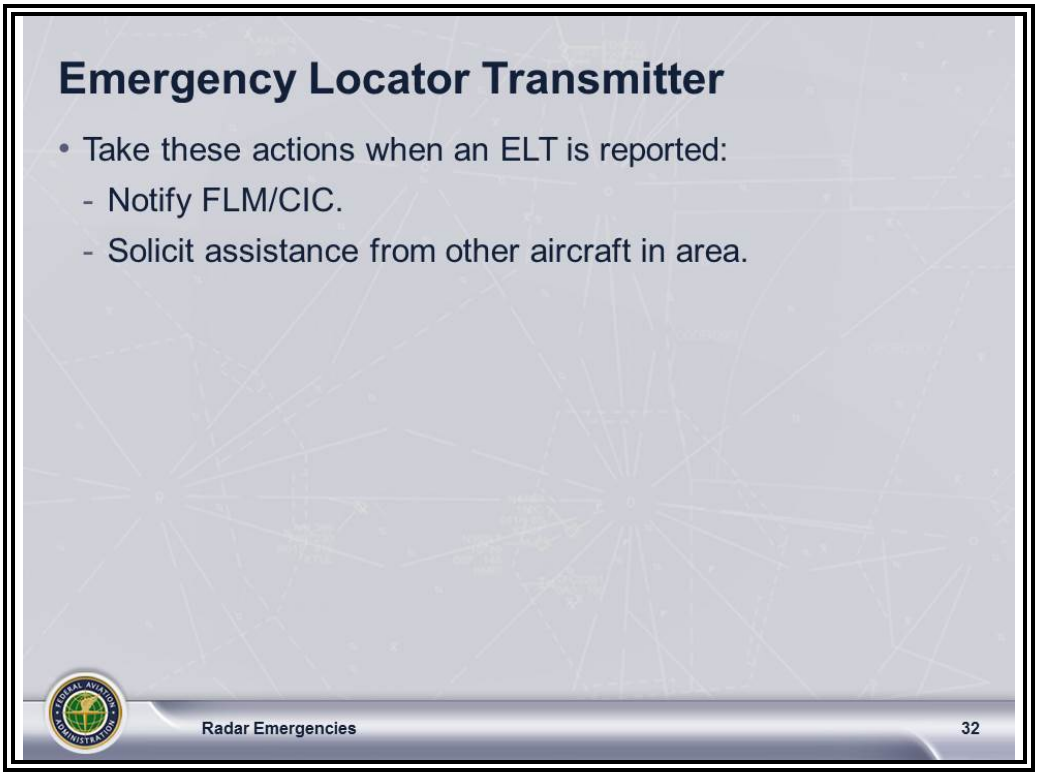
VFR Aircraft in Weather Difficulty (Cont'd)
JO 7110.65, pars. 10-2-7, 10-2-8, 10-2-16

⊙ If aircraft has already encountered IFR conditions:

- Inform pilot of the appropriate terrain/obstacle clearance minimum altitude.
  - MIA
  - MEA
  - MOCA
  - MVA
- If aircraft is below minimum altitude but radar identification has been established:
  - Furnish a heading/radial on which to climb to reach appropriate minimum altitude.
  - An appropriate keyboard entry must be made to ensure en route MSAW (EMSAW) alarm processing.

UNUSUAL SITUATIONS *(Continued)*

Emergency Locator Transmitter (ELT) Signals
JO 7110.65, par. 10-2-10; AIM, par. 6-2-5



⊙ When an ELT is heard or reported:

- Notify RCC and forward any pertinent information.

NOTE: FLM/CIC initiates coordination.

- Solicit assistance of other aircraft operating in signal area.
- You can expect pilots to report the aircraft's:
  - Position and time the signal was first and last heard
  - Position at maximum signal strength
  - Altitude and frequency ELT signal was received on
  - Position in relation to a navigational aid
  - Bearing to the ELT signal if aircraft has homing equipment

Continued on next page

UNUSUAL SITUATIONS *(Continued)*

Emergency Locator Transmitter (ELT) Signals (Cont'd)
JO 7110.65, par. 10-2-10; AIM, par. 6-2-5

- When ELT signal strength indicates it may be emanating from or near an airport, notify:
  - On-site airway facilities personnel
  - Regional Operations Center (ROC)
- Notify RCC and ROC if signal source is:
  - Located
  - Terminated

UNUSUAL SITUATIONS *(Continued)*

Hijacked Aircraft
JO 7110.65, par. 10-2-6;
JO 7610.4, pars. 7-4-1, 7-4-2, 7-4-3

Definition
JO 7110.65, Pilot/Controller Glossary

TRACK OF INTEREST (TOI) − Displayed data representing an airborne object that threatens or has the potential to threaten North America or National Security. In certain circumstances, an object may become a TOI based on specific and credible intelligence pertaining to that particular aircraft/object, its passengers, or its cargo.

Continued on next page

Hijacked Aircraft (Cont'd)
JO 7110.65, par. 10-2-6; JO 7610.4, pars. 7-4-2. c., 7-4-3. a.-d.

- ⊙ Hijack attempts or actual events are a matter of national security and require special handling.
  - Policy and procedures for hijack situations are detailed in FAA Order JO 7610.4, Special Operations.
  - Pilots may use a four-tiered scheme to relay threat levels.
    - Level 1: Disruptive behavior
    - Level 2: Physically abusive behavior
    - Level 3: Life-threatening behavior (Weapon)
    - Level 4: Attempted or actual breach of the flight deck
  - If a pilot communicates any threat
    - Consider the situation urgent
    - Comply with pilot requests
    - Inform the FLM/CIC

NOTE: Controllers should be aware as the threat level increases, the seriousness of the security threat also increases, which will normally result in less time to react and respond appropriately to the situation. Controllers are cautioned that escalation between threat levels can happen rapidly.

Hijacked Aircraft: Aircrew Objectives
JO 7610.4, pars. 7-4-1, 7-4-3

- ⊙ In any suspected or actual hijack attempt, the aircrew's basic objective is to get the aircraft on the ground as quickly as possible and keep it there.
  - If a pilot needs to land quickly, the pilot will request an emergency descent clearance.

UNUSUAL SITUATIONS *(Continued)*

Hijacked Aircraft: ATC/Aircrew Communications
JO 7610.4, pars. 7-4-1, 7-4-2, 7-4-3

- In the event of hijack, air carrier/cargo crews must communicate or respond to routine ATC transmissions in clear, plain English. If unable, alternate means may be used to communicate with ATC such as:
  - Aircraft Communications Addressing and Reporting System (ACARS) messages that can be relayed by airline operations centers
  - Unfamiliar or unnecessarily formal language
    - If uncertain as to the pilot's intent, ATC may ask, without using the word hijack, if there is a problem.
- When ATC knows or believes that a hijack situation exists, no reference must be made in radio communications to the nature of the emergency:
  - Unless it has first been referred to in radio communications from the aircraft involved, or
  - Unless the pilot is transmitting in plain English and it is certain that such reference will not aggravate the situation
- During an incident, ATC may be asked to query the pilot as to whether plain English communication is possible.
  - If the response is affirmative, ATC may be directed to pass information to or solicit information from the pilot.
  - If the response is negative or unfamiliar/unnecessarily formal, ATC must limit transmissions to essential ATC functions.
- If an aircrew indicates in any way that clear, plain English communication with ATC is not possible, ATC must confine communications to regular ATC coordination unless otherwise directed.

UNUSUAL SITUATIONS *(Continued)*

Hijacked Aircraft: Possible Pilot Messages/ Signals
JO 7610.4, par. 7-4-3; TI 6110.100, par. 4.3.4

⊙ In the event of a hijack, the pilot may:

- Make a clear, plain English radio transmission of a hijack. (NOTIFY YOUR FLM/CIC.)
  - – ATC must assign code 7500 to the aircraft.
- Make a radio transmission indicating the possibility of hijack without squawking 7500. (NOTIFY YOUR FLM/CIC.)
  - – ATC must assign code 7500 to the aircraft.
    - → If the pilot questions such assignment or otherwise indicates that no hijack exists, ATC can determine the specific nature of the situation.
    - → If the pilot acknowledges the assignment without further communication or fails to acknowledge or communicate further, ATC must assume the flight is being hijacked.
- Set the transponder to code 7500. (NOTIFY YOUR FLM/CIC.)
  - – HIJK will blink in Field E in the data block.
  - – ATC will acknowledge receipt of code 7500 by asking the pilot to confirm squawking 7500.

✈ **Phraseology**

"(Identification) (facility name) CONFIRM THAT YOU ARE INTENTIONALLY SQUAWKING SEVEN FIVE ZERO ZERO."

⊙ If unable to change transponder settings, the pilot will transmit a radio message indicating a code change to 7500. (NOTIFY YOUR FLM/CIC.)

Example: "Chicago Center, DAL1175 squawking seven five zero zero."

⊙ Due to air-to-ground capabilities such as data links or cell phones, ATC may learn of a hijack situation from sources other than the aircrew itself.

UNUSUAL SITUATIONS *(Continued)*

Hijacked Aircraft: ATC Procedures
JO 7610.4, pars. 4-12-6, 4-13-1, 7-1-3, 7-3-1, 7-4-3

- Aircraft squawking or indicating code 7500 will be considered under hijack, and the appropriate procedure must be followed.
  - NOTIFY YOUR FLM/CIC.
- ATC must honor clearance requests, traffic conditions permitting.
- To the extent possible, aircraft that appear headed toward prohibited/restricted airspace or orbiting/lingering over a highly sensitive area must be advised to change course and/or altitude.
  - ATC must not divulge unnecessary information about the nature of the airspace/area and use their judgment while advising aircraft to change course and/or altitude.

Continued on next page

Hijacked Aircraft: ATC Procedures (Cont'd)
JO 7610.4, pars. 4-12-6, 4-13-1, 7-1-3, 7-3-1, 7-4-3, 7-5-2

- If escort (military) aircraft are dispatched, every precaution must be taken to prevent the hijacker(s) from gaining knowledge that an escort is being conducted.
- Communications with escort aircraft must be on a different frequency than the one used to communicate with the hijacked aircraft and must not be simultaneously broadcast on a frequency that may be heard by the hijacked aircraft.
- When escort aircraft are under FAA control, standard ATC separation must be applied.
- In no case must any clearance or instruction to the aircraft compromise ATC standards.
- Escort aircraft may request ATC approval to set transponders to standby for Mode 3 in order to prevent TCAS detection of the escort by a hijacked aircraft.
- Provide all possible assistance to any military aircraft assigned hijacked aircraft escort duties.
- The purpose of the escort is to ensure positive flight-following, report unusual observations, and aid in Search and Rescue (SAR).

Continued on next page

UNUSUAL SITUATIONS *(Continued)*

Hijacked Aircraft: ATC Procedures (Cont'd)
JO 7610.4, pars. 4-12-6, 4-13-1, 7-1-3, 7-3-1, 7-4-3, 7-5-2

- When the hijacked aircraft is within FAA radar coverage, the appropriate FAA facility provides control services.
  - Apply standard separation.
- When the hijacked aircraft is **NOT** within FAA radar coverage but is within military radar coverage, the military may provide control services for the escort phase only.
  - The appropriate FAA sector/facility is still responsible for separation between the escort aircraft/hijacked aircraft and other IFR traffic.
  - Apply and coordinate appropriate altitude reservations as required.
- Use a separate frequency to communicate with the escort aircraft in order to prevent hijacker knowledge of the escort aircraft.
- When possible, comply with the altitude requests of the escort aircraft.
  - Once the escort aircraft has visual contact with the hijacked aircraft, or declares interception has occurred, the intercepting aircraft will then request a block altitude encompassing the altitude of the hijacked aircraft of at least 2000 feet above and below the hijacked aircraft.
    - Once the escort declares interception, standard separation may be discontinued.
    - The escort will then operate within 5NM of the intercepted aircraft.
    - Advise escort aircraft of other known aircraft in the area.
- When hijack/escort aircraft are operating at low altitude, additional escort aircraft may be needed for communications relay between escort aircraft and control facility.
  - Position communication relay aircraft above the original escort aircraft.

Continued on next page

Hijacked Aircraft: ATC Procedures (Cont'd)
JO 7610.4, pars. 4-12-6, 4-13-1, 7-1-3, 7-5-2

- Prior to join-up with the hijacked aircraft, provide the following information to the escort aircraft:
  - Hijacked aircraft's heading, speed, and altitude
  - Destination, if known
  - Range and position in relation to the escort aircraft
- If necessary, once the pilot advises that the hijacked aircraft is in sight, the escort mission may continue without radar contact.
- When terminating the escort, issue a heading of at least 90 degrees divergent from the hijacked aircraft's heading.
- Keep aircraft advised of information pertaining to their recovery base, including relative position, distance, and weather.

Continued on next page

Hijacked Aircraft: ATC Procedures (Cont'd)
JO 7610.4, pars. 4-12-6, 4-13-1, 7-1-3, 7-5-2

NOTE: A track of interest (TOI) is an airborne object that threatens or has the potential to threaten North America or National Security. Indicators of a TOI may include, but are not limited to:

- Noncompliance with ATC instructions or aviation regulations
- Extended loss of communications
- Unusual transmissions or unusual flight behavior
- Unauthorized intrusion into controlled airspace

In certain circumstances, an aircraft may become a TOI based on credible intelligence pertaining to the aircraft, its passengers, or its cargo.

Continued on next page

UNUSUAL SITUATIONS *(Continued)*

Hijacked Aircraft: ATC Procedures (Cont'd)
JO 7610.4, pars. 4-7-3, 4-12-6, 4-13-1, 7-1-3, 7-5-2

Click 2 times to animate.

- During active air defense missions ATC must provide:
  - Priority and maximum assistance to expedite the movement of interceptors
  - The most direct clearance to the TOI
- When it is determined that operations within the ATC system will delay the intercept of a TOI and adversely affect national security, NORAD may declare "AFIO."
  - Authorization for Interceptor Operations (AFIO). An authority used for the movement of interceptors under NORAD operational jurisdiction while on an active air defense mission when it is determined by competent military authority that operations within the NAS would significantly derogate the mission.

NOTE: Interceptors deviating from ATC clearance may lose the positive radar separation normally provided between interceptors and all other aircraft.

Continued on next page

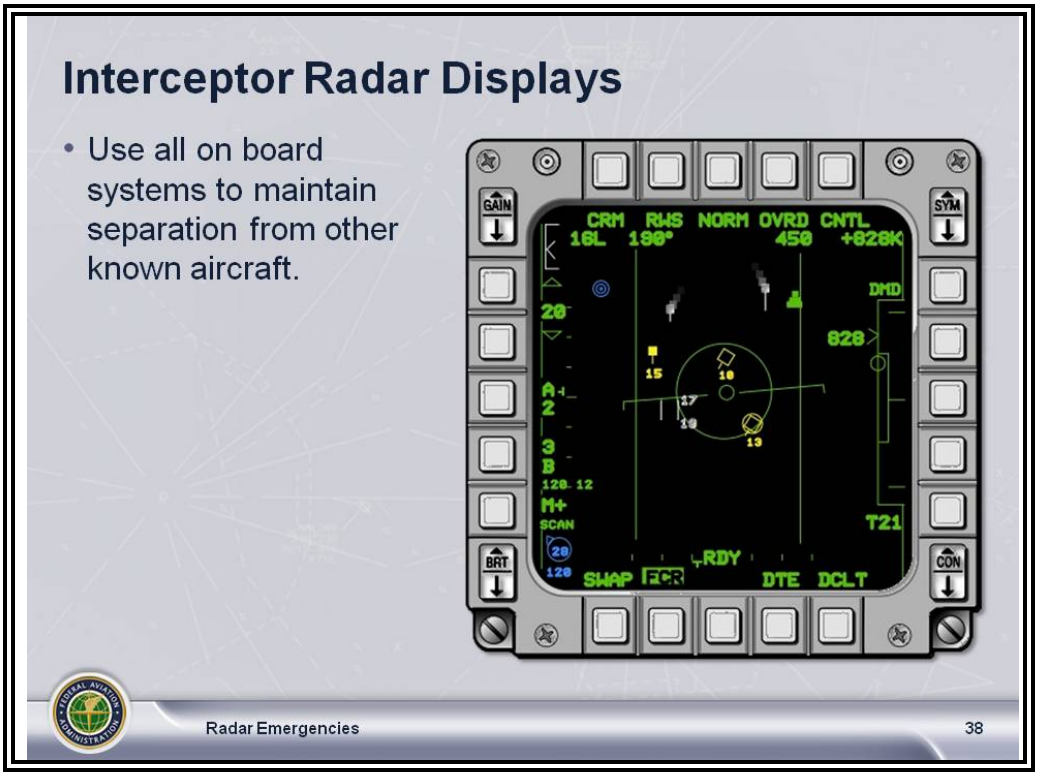
Hijacked Aircraft: ATC Procedures (Cont'd)
JO 7610.4, pars. 4-7-3, 4-12-6, 4-13-1, 7-1-3, 7-5-2

- Upon declaring "AFIO":
  - NORAD assumes responsibility for interceptors seeing and avoiding all known aircraft and ensuring safe intercept conduct.
  - Interceptors will:
    - Notify ATC and then maneuver as required to ensure successful TOI intercept.
    - Adjust transponders to reply on Mode 3/A Code 7777.
    - Use all on board systems to maintain separation from other known aircraft.
    - Advise ATC when the TOI has been acquired by onboard systems and/or visual contact has been achieved.
    - Notify the ATC facility when the TOI has been intercepted.
    - Inform ATC of active air defense mission termination by stating "AFIO terminated" on the frequency provided by the Air Defense Control Facility (ADCF), and request an IFR clearance.

Continued on next page

UNUSUAL SITUATIONS *(Continued)*

Hijacked Aircraft: ATC Procedures (Cont'd)
JO 7610.4, pars. 4-7-3, 4-12-6, 4-13-1, 7-1-3, 7-5-2, 7-5-10

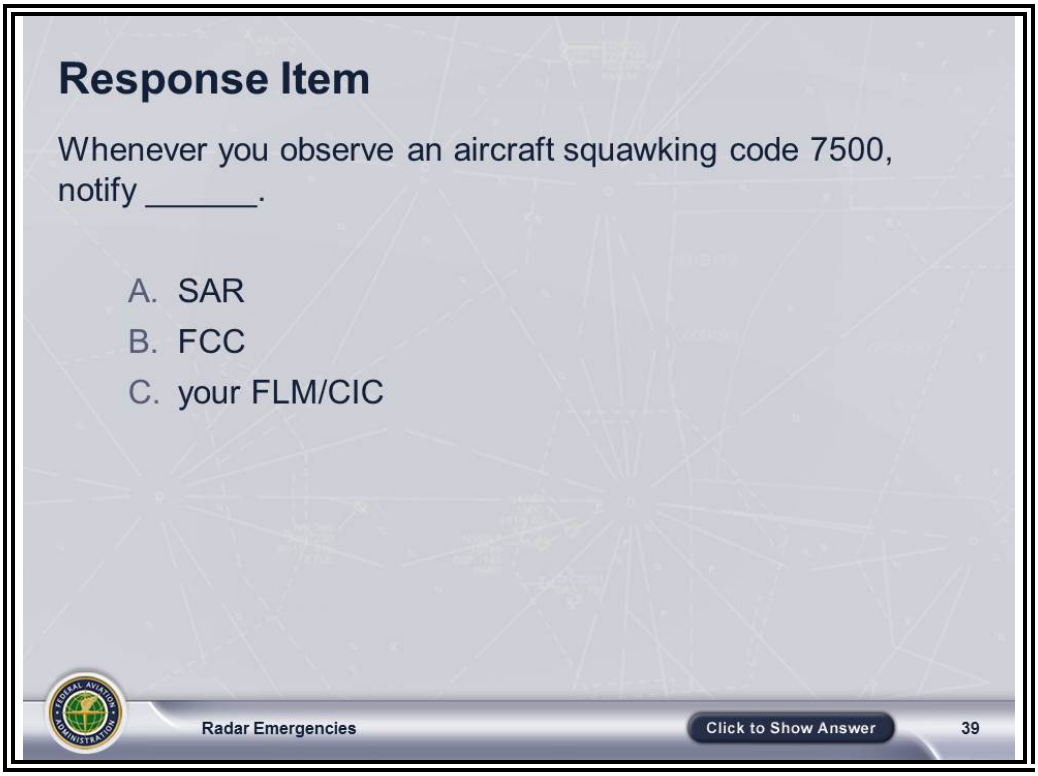


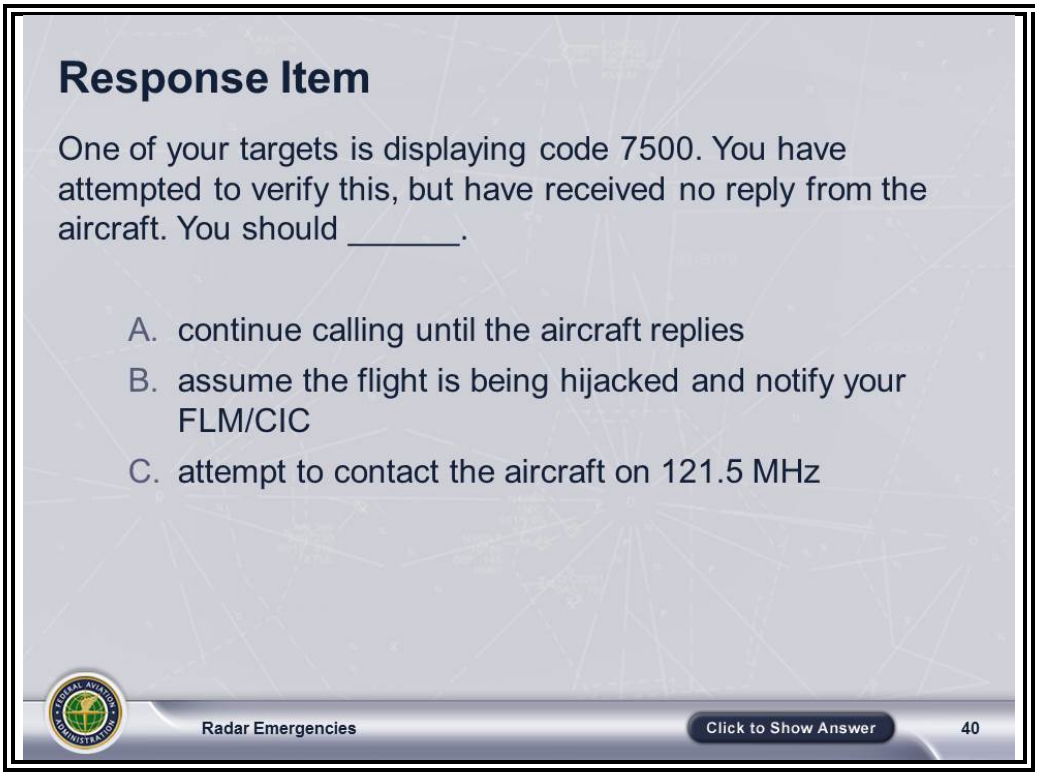
⊙ Upon declaring "AFIO" (cont'd):

- ATC facilities must:
  - Provide traffic advisory services to:
    - → Interceptors
    - → All other affected aircraft
    - → INCLUDING the TOI
      - Do not inform the TOI about the interceptor
      - Except when air safety is the primary consideration
  - Provide point outs to affected ATC sectors and/or ATC facilities.
  - Upon termination of AFIO
    - → Advise FLM/CIC of the appropriate frequency for the interceptor to request an IFR clearance to return to the Air Patrols/Combat Air Patrols (AP/CAP) or departure airfield.
  - Return to base must be accomplished under FAA control.

UNUSUAL SITUATIONS *(Continued)*

Review





SLIDE ANSWERS: Slide 39=C, Slide 40=B

UNUSUAL SITUATIONS *(Continued)*

Suspicious Aircraft/ Activities
JO 7110.65, par. 10-4-4; JO 7610.4, par. 7-3-1

⊙ A complete and comprehensive list of suspicious activities is not possible. Use sound judgment and NOTIFY YOUR FLM/CIC when one of the following situations could indicate a suspicious activity:

- Lost communications:
  - After 5 minutes or more, if radio communications have not been (re) established with the aircraft, consider the aircraft to be a suspicious activity.
  - This includes all aircraft (general aviation, law enforcement, military, aeromedical, etc.); however:
    → VFR aircraft receiving traffic advisories often change frequencies without advising ATC.
    → Use sound judgment to determine if such a frequency change is suspicious.

Continued on next page

UNUSUAL SITUATIONS *(Continued)*

Suspicious Aircraft/ Activities (Cont'd)
JO 7110.65, par. 10-4-4; JO 7610.4, par. 7-3-1

- An aircraft fails to turn on or changes from its assigned transponder code (other than approved emergency/radio failure beacon codes)
- An aircraft deviates from its assigned route of flight or altitude and refuses to return to it when asked
- Phantom or inappropriate transmissions are made, such as unusual questions about military activities or sensitive/secure areas
- Inconsistent or abnormal repetitive aircraft activity occurs, such as flights over/near sites of interest or prohibited/restricted airspace, inappropriate speed or rate of climb/descent, or missed crossing restrictions or reporting points
- A pilot reports flight difficulties with no eventual explanation or response to ATC
- Any air carrier, cargo, or scheduled air taxi requests to divert from its original destination or route for any reason other than weather
- General aviation and non-scheduled air taxi or charter services request to divert from their original destination or route for any unusual reason (other than weather, company request, passenger request, mechanical, etc.)
- Any other situation occurs that may indicate a suspicious aircraft/pilot activity such as background noise or change in pilot's voice characteristics

UNUSUAL SITUATIONS *(Continued)*

Security Notice (SECNOT)
JO 7110.65, par. 9-2-11, Pilot/Controller Glossary

- ⊙ Upon receiving notification of a SECNOT, you must forward all information on the subject aircraft to the FLM/CIC.
- ⊙ If information is not known, broadcast the call sign on all frequencies and advise the FLM/CIC of the response.

NOTE: A Security Notice (SECNOT) is a request originated by the Air Traffic Security Coordinator (ATSC) for an extensive communications search for aircraft involved, or suspected of being involved, in a security violation, or are considered a security risk. A SECNOT will include the aircraft identification, search area, and expiration time. The search area, as defined by the ATSC, could be a single airport, multiple airports, a radius of an airport or fix, or a route of flight. Once the expiration time has been reached, the SECNOT is considered to be cancelled.

Special Interest Sites
JO 7110.65, par. 9-2-9

- ⊙ Relay immediately to the FLM/CIC any reports or information regarding unusual aircraft activities in the vicinity of special interest sites such as:
  - Nuclear power plants
  - Power plants
  - Dams
  - Refineries, etc.

Bomb Threat
JO 7110.65,
pars. 10-2-11,
10-2-12

- When information is received from any source that a bomb has been placed on or near an aircraft:
  - Notify FLM/CIC or facility air traffic manager.
- If threat is general in nature, handle it as a suspicious activity.

NOTE: Suspicious activity is covered in FAA Order JO 7210.3, paragraph 2-7-6, and FAA Order 7610.4, paragraph 7-4-1.

- If threat is targeted against a specific aircraft and you are in contact with that aircraft:
  - Advise the pilot of threat.
  - Inform pilot that technical assistance is available from an FAA aviation explosives expert.
    - Available at all times
    - Technical advice can be relayed

Continued on next page

Bomb Threat (Cont'd)
JO 7110.65, pars. 10-2-11, 10-2-12

⊙ Ask if pilot desires descend/climb to equalize pressure.

- Issue appropriate clearance considering:
  - MEA
  - MOCA
  - MRA
  - Weather

⊙ Handle aircraft as an emergency and/or provide the most expeditious handling with respect to safety of other:

- Aircraft
- Ground facilities
- Personnel

NOTE: Emergency handling is discretionary and must be based on the situation. With certain types of threats, plans may call for a low-key action or response.

⊙ Issue or relay clearance to new destination, if requested.

⊙ When pilot requests technical assistance, or it is apparent that pilot needs such assistance:

- Do **NOT** suggest what actions pilot must take.
- Obtain the following information:
  - Type, series, and model of aircraft
  - Precise location/description of bomb device, if known
  - Other pertinent details
- Notify FLM/CIC, who will then contact FAA explosives expert.

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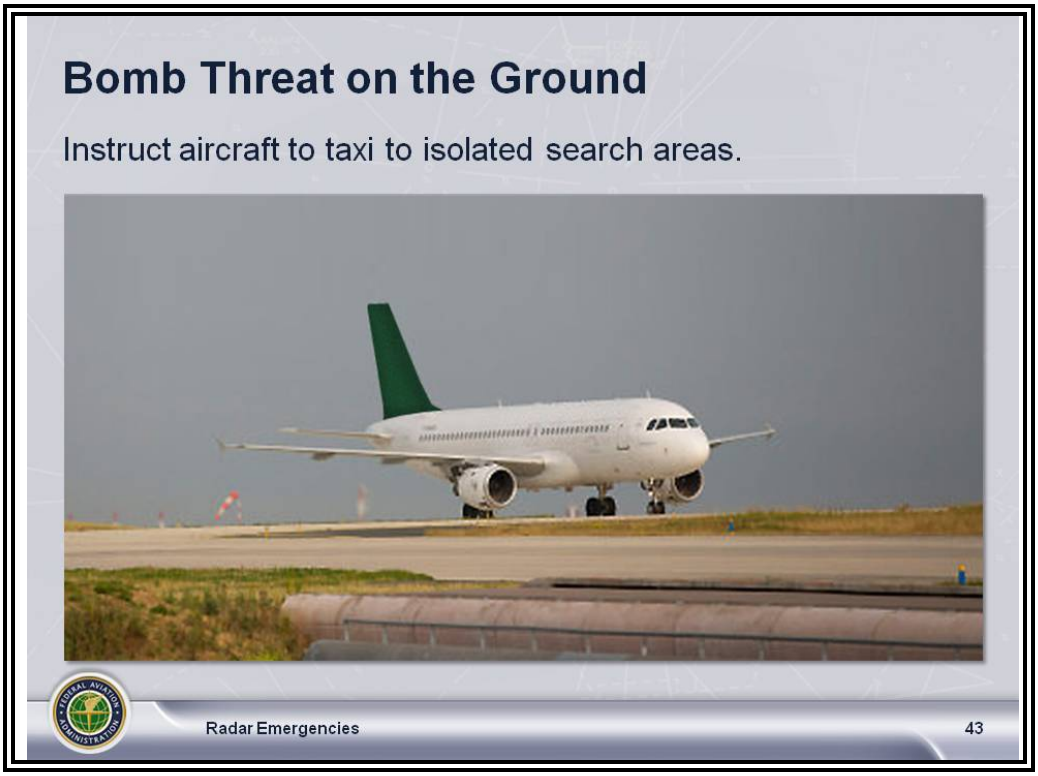
Bomb Threat (Cont'd)
JO 7110.65, pars. 10-2-11, 10-2-12



- ⊙ If aircraft is on the ground and in radio contact:
  - Advise aircraft to:
    - Remain as far away from other aircraft and facilities as possible.
    - Clear the runway.
    - Taxi to an isolated or designated search area, if appropriate.
  - At airports where tower control or FSS advisory service is **NOT** available:
    - Recommend delay of takeoff until pilot or aircraft operator establishes that a bomb is not on board.
    - If pilot insists on taking off and it will not adversely affect other traffic, issue or relay an ATC clearance.
  - Advise other aircraft to remain clear of suspect aircraft by at least 100 yards if pilot takes alternative actions (e.g., parking and off-loading immediately).
- ⊙ If unable to inform pilot of a bomb threat or if radio contact is lost:
  - Advise FLM/CIC.
  - Relay details to concerned facilities.

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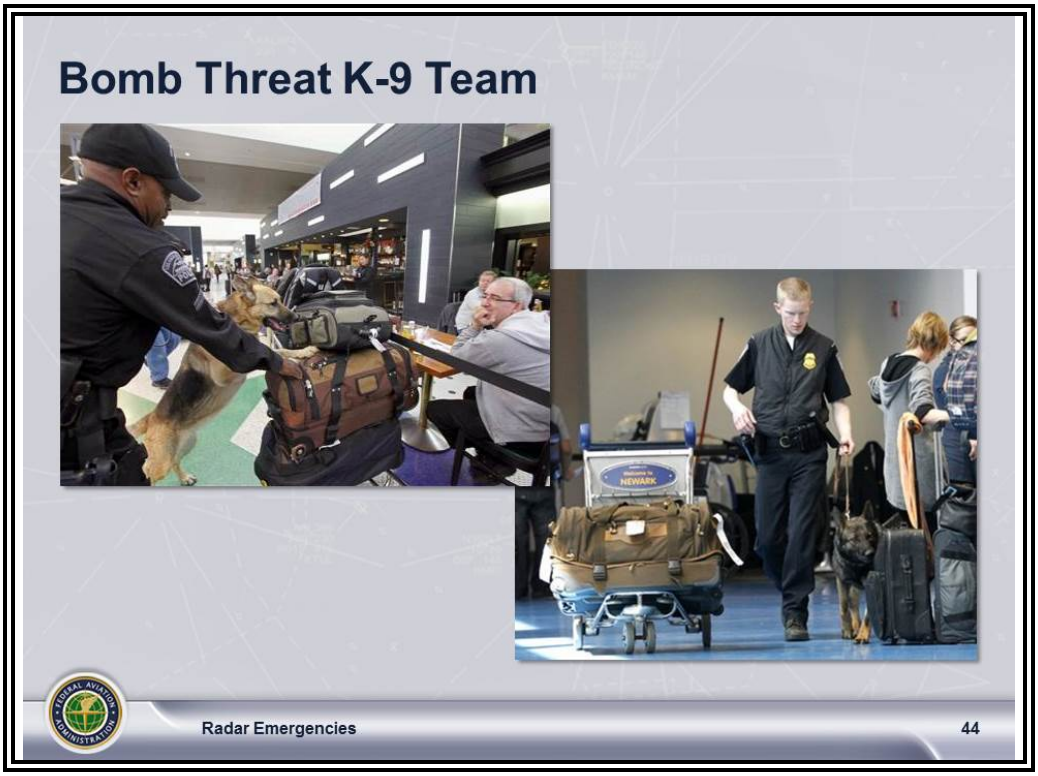
UNUSUAL SITUATIONS *(Continued)*

Bomb Threat (Cont'd)
JO 7110.65, pars. 10-2-11, 10-2-12



- If a bomb or suspected bomb is discovered on aircraft:
  - Determine pilot's intentions.
  - Comply with pilot's requests to the extent possible.
- Give special consideration to handling of aircraft when hijacker has or is suspected of having a bomb.
  - Be responsive to pilot's request.
  - Notify FLM/CIC.
  - Apply hijack procedures.
- When an aircraft requests explosive detection K-9 team:
  - Obtain aircraft ID and position.
  - Advise FLM/CIC of pilot's request.
  - Relay location of nearest K-9 team to pilot.
    - If aircraft wishes to divert to this airport location:
      - → Obtain Estimated Time of Arrival (ETA) from pilot.
      - → Advise FLM/CIC.

UNUSUAL SITUATIONS *(Continued)*

Navy Fleet Support Missions
JO 7110.65, par. 10-5-1

- When you receive information concerning an emergency to U.S. Navy "Special Flight Number" aircraft:
  - Relay immediately, via collect phone call, to Fleet Operations Control at Norfolk, VA:
    - The words "Special Flight Number" followed by the number given as part of the routine IFR flight information
- Honor all pilot requests for changes to route, altitude, and destination whenever possible.

UNUSUAL SITUATIONS *(Continued)*

Ground Missile Emergencies
JO 7110.65, pars. 10-7-1 thru 10-7-5

⊙ When you receive information concerning ground missile emergencies:

- Notify other concerned facilities.
- Take action to have alert advisories issued by:
  - Air carrier companies for each VFR company aircraft operating in the vicinity of emergency
  - FSSs adjacent to the emergency location

Continued on next page

UNUSUAL SITUATIONS *(Continued)*

Ground Missile Emergencies (Cont'd)
JO 7110.65, pars. 10-7-1 thru 10-7-5

⊙ Reroute IFR and Special VFR aircraft to avoid emergency location by one of the following minima:

- Lateral separation - 1 mile around area
  - – Location determined on radar, or
  - – Airspace protected for route being flown
- Vertical separation - 6,000 feet above emergency location

NOTE: Minima may be increased by the notifying official.

⊙ Advise VFR aircraft to avoid area by the following minima or greater when suggested by notifying official:

- Lateral separation - 1 mile
- Vertical separation - 6,000 feet

⊙ Advise all aircraft to avoid smoke columns in the area.

⊙ Issue a Notice to Airmen (NOTAM) when the emergency will exist for an extended period of time.

Unauthorized Laser Illumination of Aircraft
JO 7110.65, par. 10-2-14

⊙ When a laser event is reported to an air traffic facility, broadcast a general caution warning on all appropriate frequencies every 5 minutes for 20 minutes following the last report.

✈ **Phraseology**

"UNAUTHORIZED LASER ILLUMINATION EVENT, (location), (altitude)."

UNUSUAL SITUATIONS *(Continued)*

MANPADS Alert
JO 7110.65, par. 10-2-13

⊙ When a threat or attack from Man-Portable Air Defense Systems (MANPADS) is determined to be real:

- Do not withhold landing clearance.
- Advise the pilot of the threat or attack, or post-event activity.
  - The pilot or operator will determine what action to take.

⊙ MANPADS information will be disseminated using ATIS and/or controller-to-pilot transmissions.

- Transmit MANPADS information over the radio until available on ATIS.
  - And pilots indicate they have the appropriate ATIS code

⊙ MANPADS information will include:

- Nature and location of threat
- Whether reported or observed, and by whom
- Time (if known)
- Request for pilot's intentions
  - If transmitting to an individual aircraft

✈ **Phraseology**

"ATTENTION (aircraft identification), MANPADS ALERT. EXERCISE EXTREME CAUTION. MANPADS THREAT/ATTACK/POST-EVENT ACTIVITY OBSERVED/REPORTED BY (reporting agency) (location) AT (time, if known). (When transmitting to an individual aircraft) SAY INTENTIONS."

Examples:

- "ATTENTION UNITED FOUR TWENTY-TWO, MANPADS ALERT. EXERCISE EXTREME CAUTION. MANPADS THREAT REPORTED BY TSA, O'HARE VICINITY. SAY INTENTIONS."
- "ATTENTION ALL AIRCRAFT, MANPADS ALERT. EXERCISE EXTREME CAUTION. MANPADS ATTACK OBSERVED BY TOWER NORTHEAST OF AIRPORT AT ONE-NINER-THREE-FIVE ZULU."

⊙ Continue to report MANPADS threat/attack/post-event activity until advised by FAA headquarters.

UNUSUAL SITUATIONS *(Continued)*

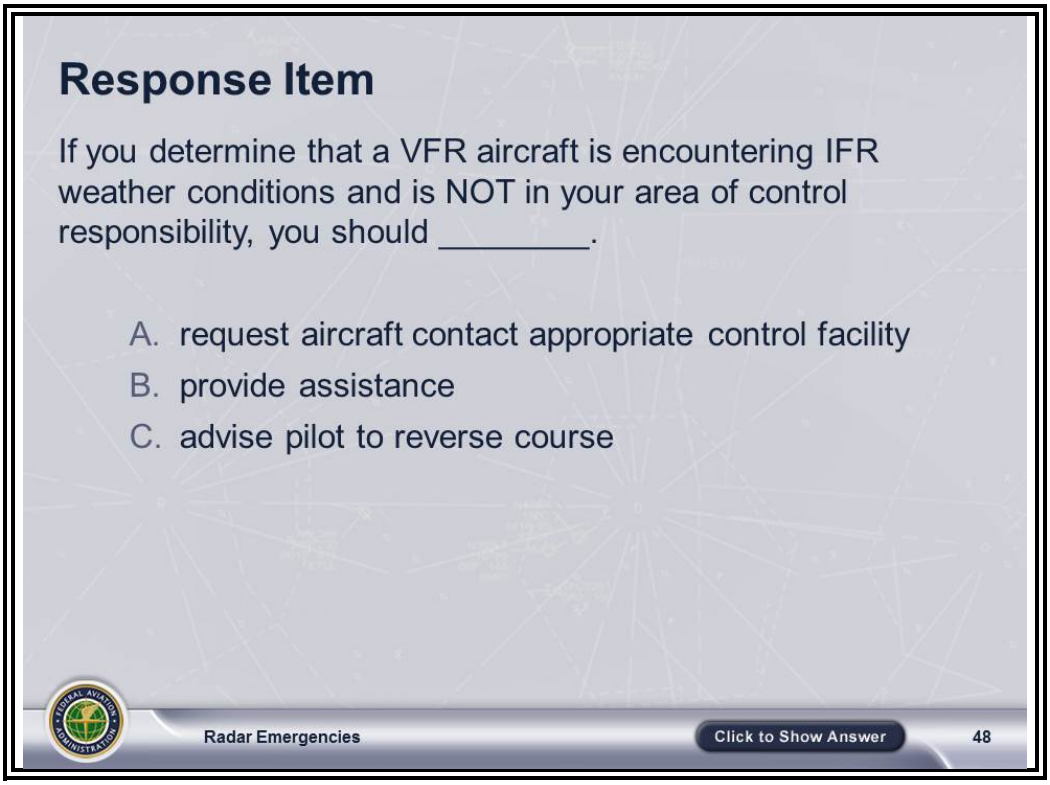
Volcanic Ash
JO 7110.65,
par. 10-2-18

- ⊙ If a volcanic ash cloud is known or forecast to be present, consider its possible effects on aircraft.
  - Relay cloud position and altitude information to pilots.
  - Suggest reroute to avoid area.
- ⊙ If aircraft advises that it has entered a volcanic ash cloud and that a distress situation exists:
  - Consider aircraft to be an emergency.
  - Do **NOT** initiate climb clearances to turbine powered aircraft.
  - Do **NOT** provide escape vectors without pilot concurrence.

NOTE: Volcanic ash clouds are not normally detected by airborne or ATC radar. The recommended escape maneuver is to reverse course and begin descent, terrain permitting. However, it is the pilot's responsibility to determine the safest escape route. You must be aware of the possibility of complete power loss to any turbine-powered aircraft encountering an ash cloud.

UNUSUAL SITUATIONS *(Continued)*

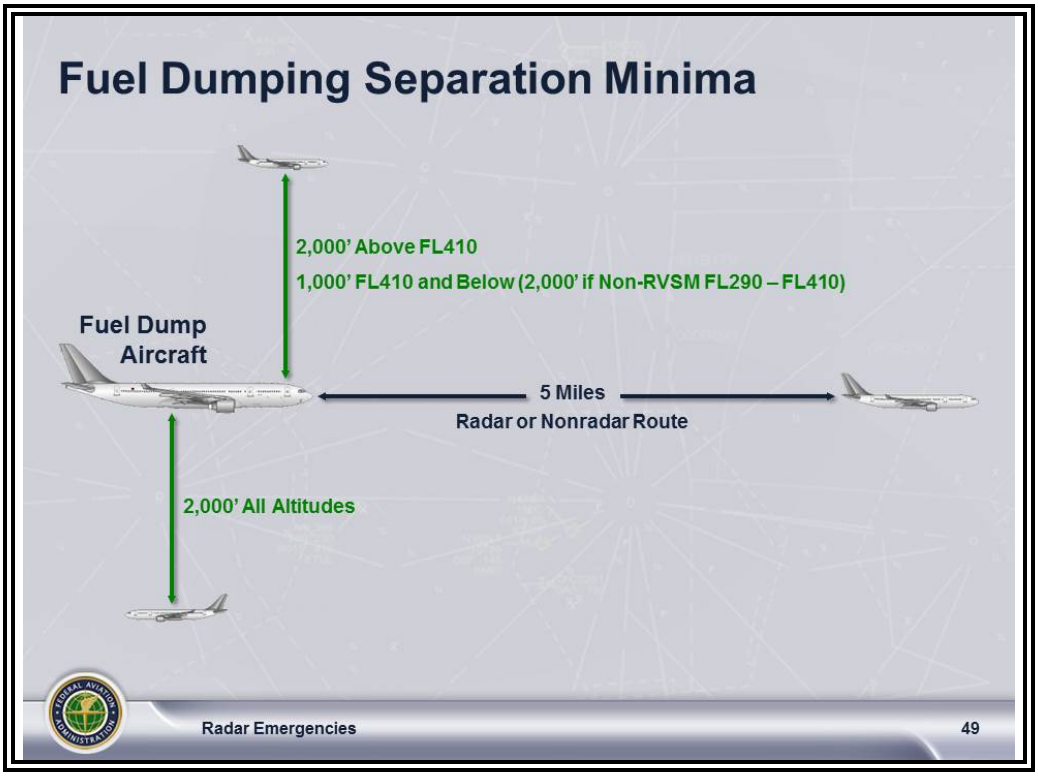
Review



SLIDE ANSWER: A

UNUSUAL SITUATIONS *(Continued)*

Fuel Dumping
JO 7110.65,
par. 9-4-1 thru
9-4-5



- When information is received that an aircraft plans to dump fuel, determine the route and altitude it will fly and the weather conditions in which the operation will be conducted.

  - Except when dumping fuel for emergency reasons, an aircraft in either VFR or IFR conditions may be requested to fly a different route.

  - If an aircraft is in IFR conditions, assign an altitude at least 2,000 feet above the highest obstacle within 5 miles of the route or pattern being flown.

Continued on next page

UNUSUAL SITUATIONS *(Continued)*

Fuel Dumping (Cont'd)
JO 7110.65, par. 9-4-1 thru 9-4-5

- Provide separation between IFR aircraft and the fuel dumping aircraft by one of the following:
  - 1,000 feet **above** it (through FL410)
    - → 2,000 feet if either aircraft is Non-RVSM (FL290-FL410)
  - 2,000 feet **above** it (above FL410)
  - 2,000 feet **below** (regardless of altitude)
  - 5 miles radar
  - 5 miles lateral (non-radar)
- Provide 5 miles separation between radar-identified VFR aircraft and the fuel dumping aircraft.
- Inform other controllers and facilities which may be affected by the fuel dumping. All affected facilities must broadcast an advisory at 3-minute intervals until fuel dumping stops.

✈ **Phraseology**

"ATTENTION ALL AIRCRAFT. FUEL DUMPING IN PROGRESS OVER (location) AT (altitude) BY (type aircraft) (flight direction)."

⊙ Broadcast an advisory when the fuel dumping has ended.

✈ **Phraseology**

"ATTENTION ALL AIRCRAFT. FUEL DUMPING OVER (location) TERMINATED."

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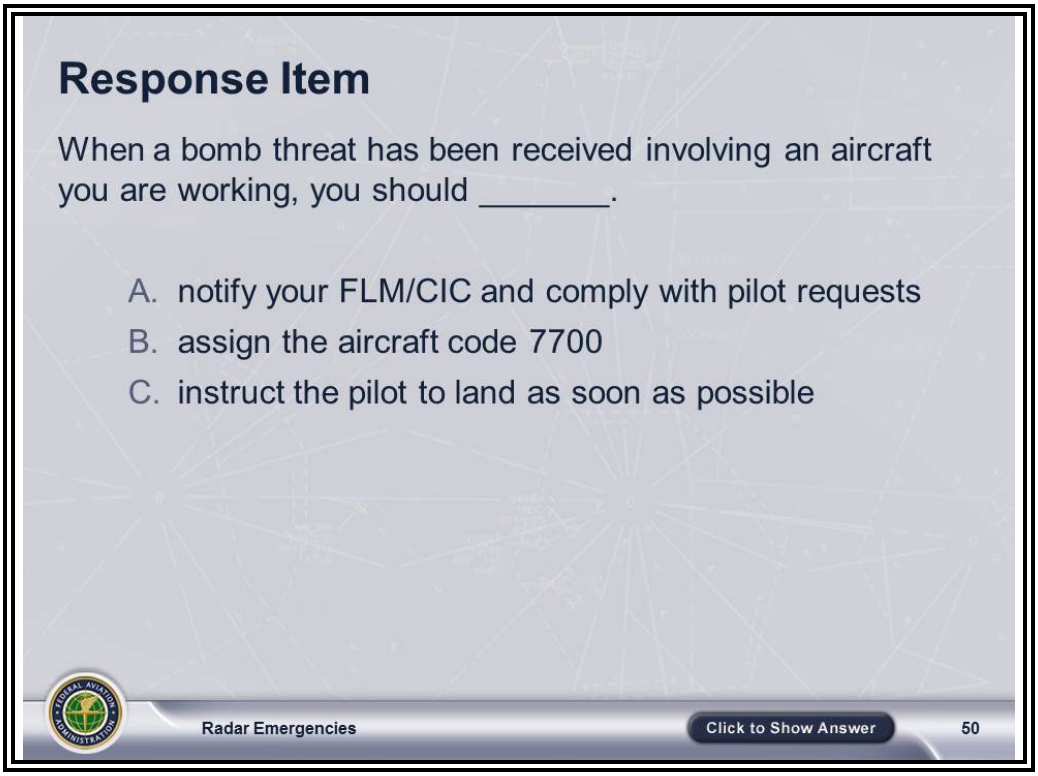
UNUSUAL SITUATIONS *(Continued)*

Review



SLIDE ANSWER: A

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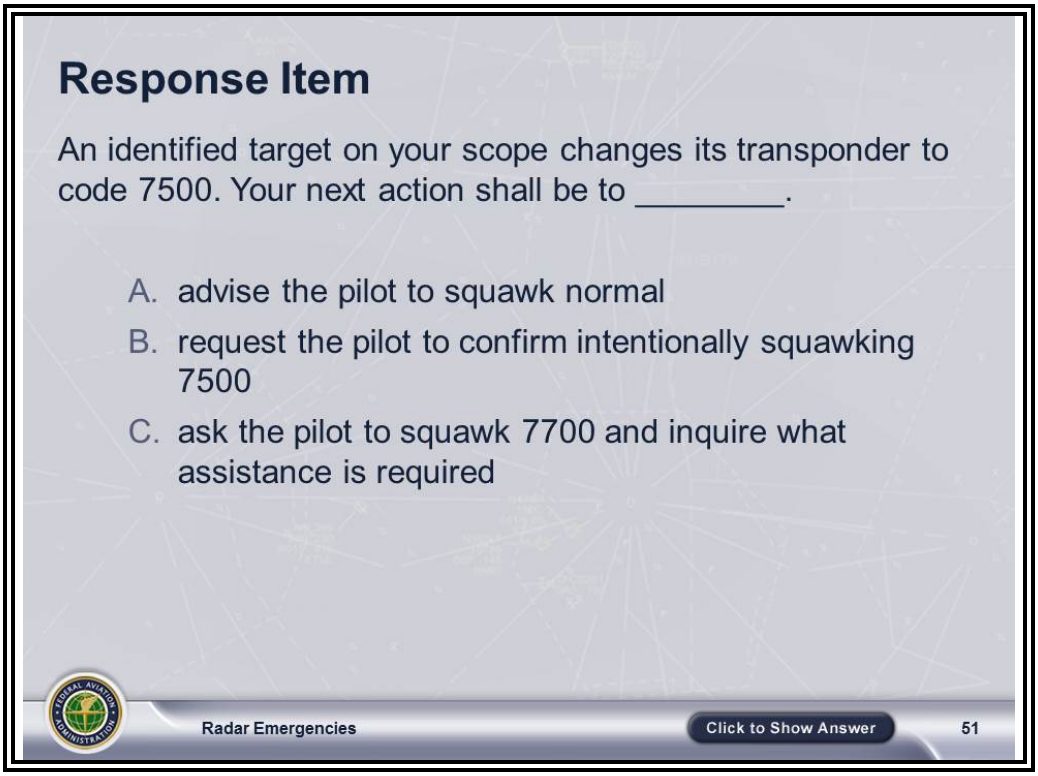
Review (Cont'd)



SLIDE ANSWER: B

QUESTION: Where, in relation to an aircraft being hijacked, must an escort aircraft be positioned?

ANSWER: *Directly behind, and no closer than 5 miles.*

QUESTION: When may the escort mission continue without radar contact?

ANSWER: *When the pilot of the escort aircraft advises that the hijacked aircraft is in sight.*

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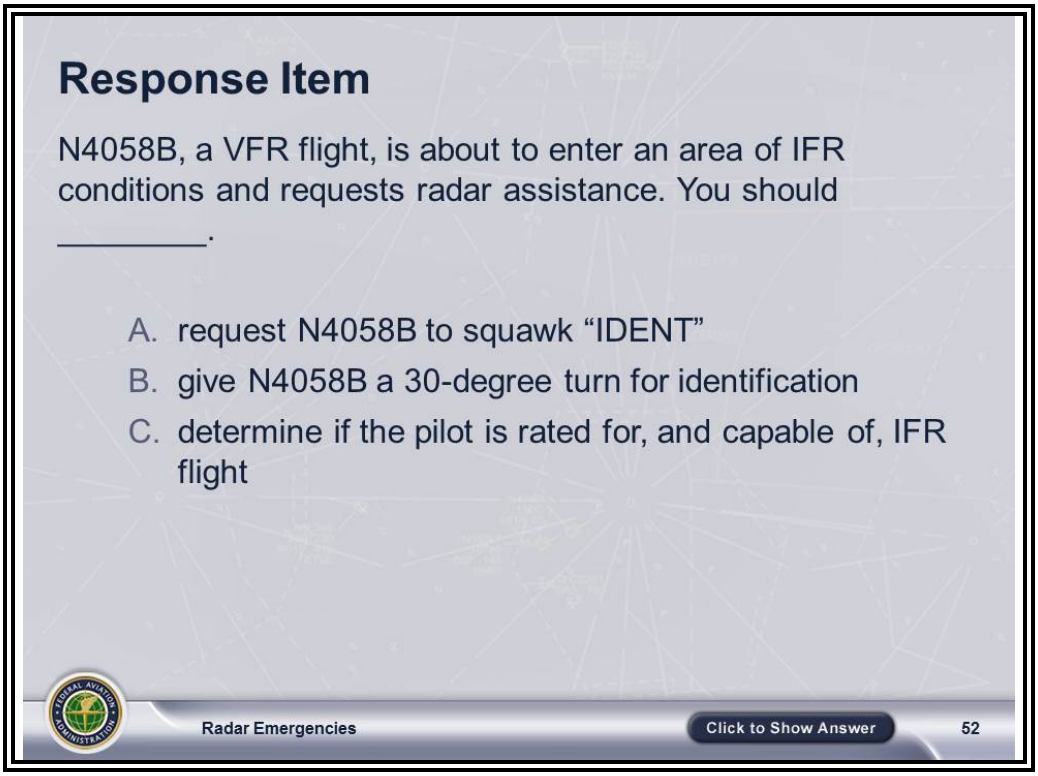
Review (Cont'd)



SLIDE ANSWER: C

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Review (Cont'd)

Response Item

If the pilot of a VFR flight about to encounter IFR conditions advises that he/she is qualified for and capable of IFR flight, you should _____.

A. issue an appropriate IFR clearance
B. request the pilot to file an IFR flight plan
C. inform the pilot of minimum safe altitude

Radar Emergencies | Click to Show Answer | 53

Response Item

If an aircraft is dumping fuel in IFR conditions, assign an altitude at least ____ feet above the highest obstacle within ____ miles of the route or pattern flown.

A. 2,000; 3
B. 1,000; 5
C. 2,000; 5

Radar Emergencies | Click to Show Answer | 54

SLIDE ANSWERS: Slide 53=B, Slide 54=C

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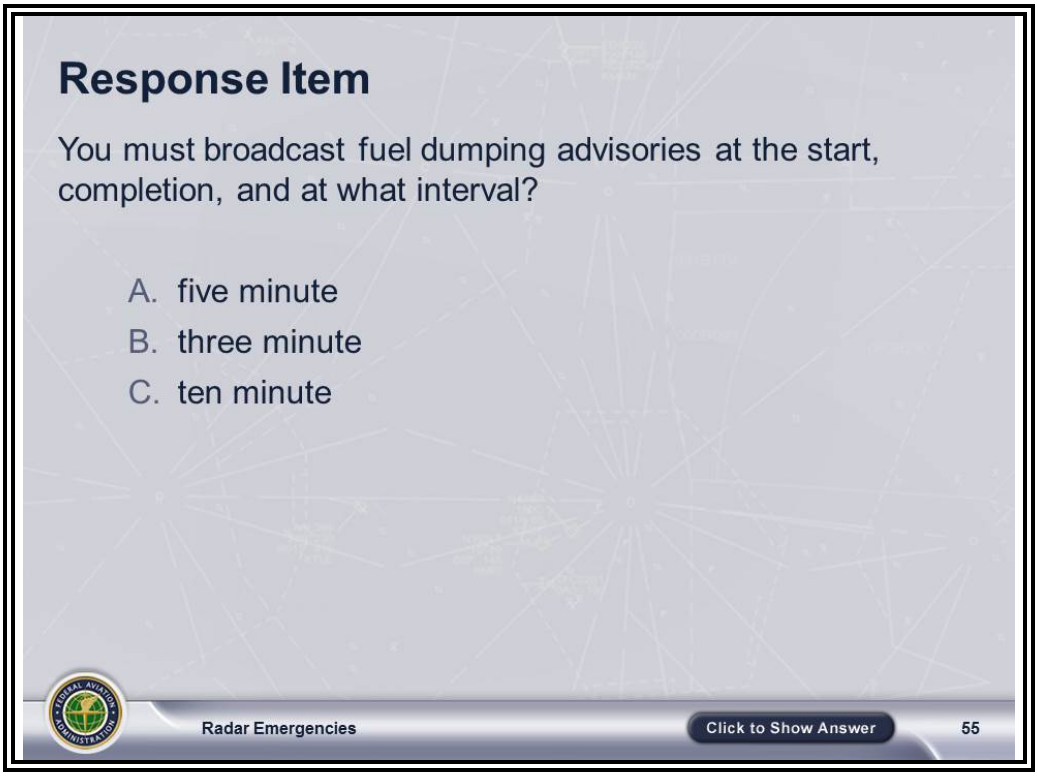
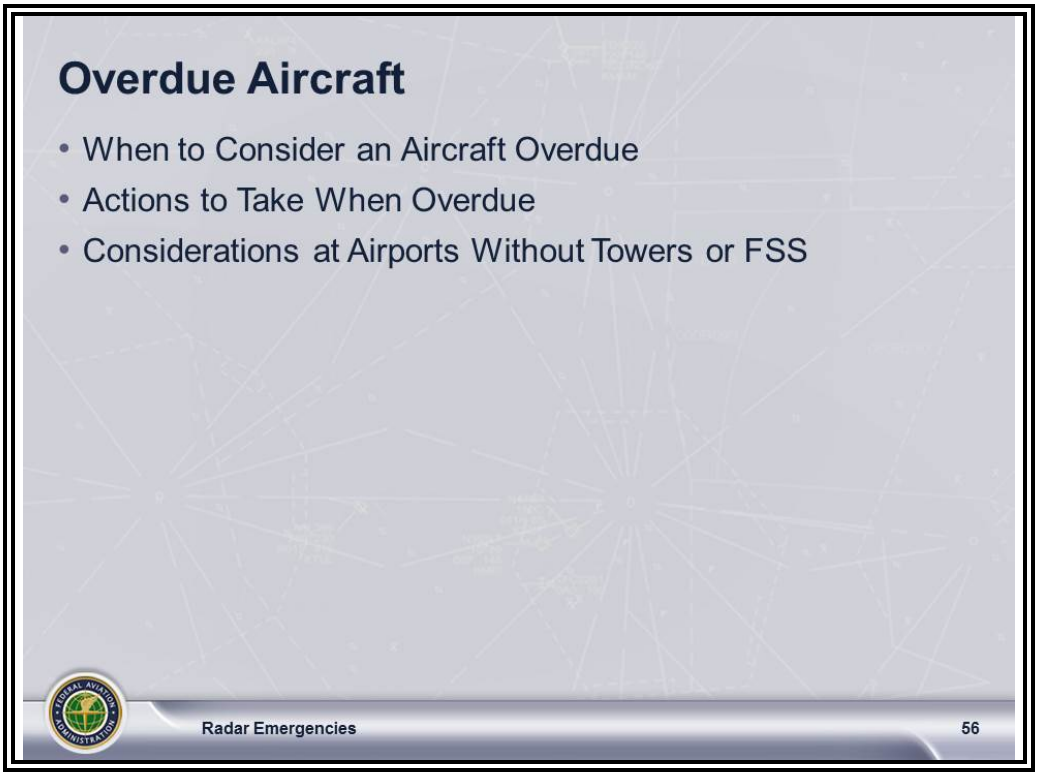
Review (Cont'd)



SLIDE ANSWER: B

OVERDUE AIRCRAFT

Procedures
JO 7110.65, pars. 10-3-1, 10-4-1, 10-4-2



⊙ When the following conditions occur:

- Neither communications nor radar contact can be established and 30 minutes have passed since:
  - ETA over a specified or compulsory reporting point or at a clearance limit in your area
  - Clearance void time

⊙ Then consider an aircraft to be overdue:

- Initiate appropriate search and rescue procedures found in FAA Order JO 7110.65, Chapter 10 Section 3, and
- Issue an ALNOT.

Continued on next page

OVERDUE AIRCRAFT

Procedures (Cont'd)
JO 7110.65, pars. 10-3-1, 10-4-1, 10-4-2

⊙ If you have reason to believe an aircraft is overdue **prior** to 30 minutes, take appropriate action immediately.

- The center in whose area the aircraft is first overdue/unreported must make this determination and take any subsequent action.

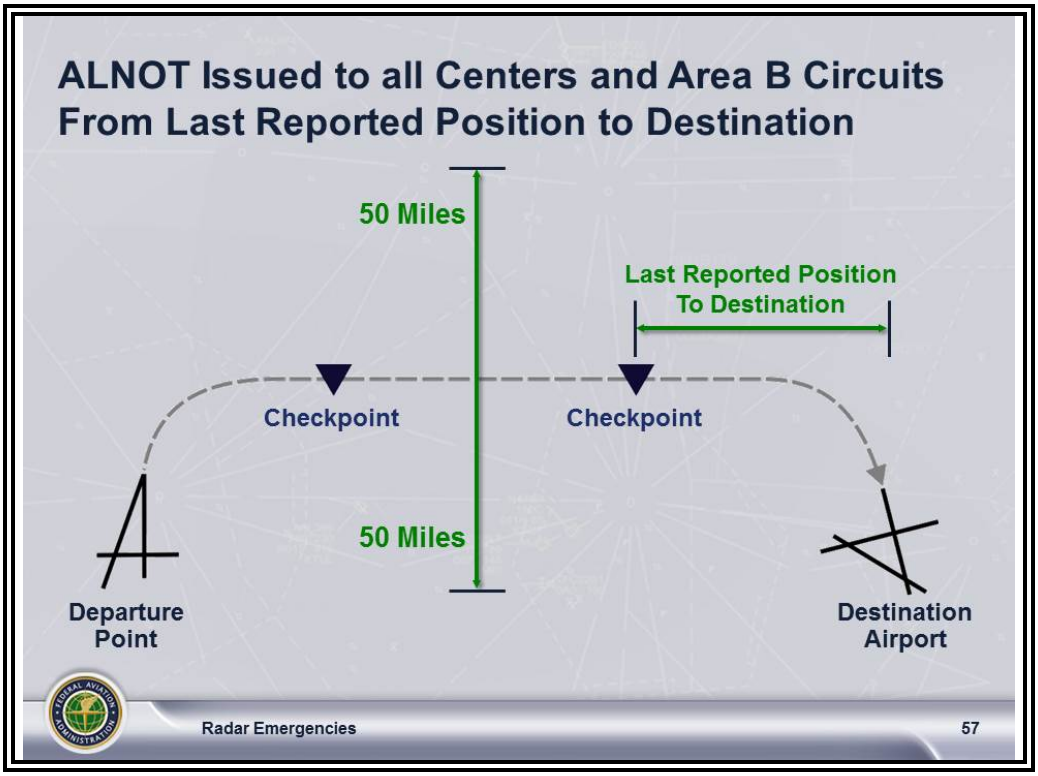
⊙ At airports with no tower or FSS:

- Request that airport management light all runway lights, approach lights, and other required airport lighting systems:
  - For at least 30 minutes before the aircraft's ETA
  - Until the aircraft has been located, or
  - 30 minutes after its fuel exhaustion time

⊙ Inform the FLM/CIC.

OVERDUE AIRCRAFT *(Continued)*

Alert Notices (ALNOTs)
JO 7110.65, par. 10-3-4



- ⊙ In addition to informing the Regional Operations Center (ROC), issue an ALNOT to all ARTCCs and Area B circuits:
  - 50 miles either side of the route of flight from last reported position to destination

NOTE: Area B refers to teletype net installed in ARTCCs, towers, and FSSs.

- ⊙ Include original or amended flight plan and last known position of aircraft.
- ⊙ When recommended by RCC or at your discretion, the ALNOT may be issued to cover maximum range of aircraft.

NOTE: ALNOT must be issued before RCC can initiate search and rescue procedures.

Continued on next page

OVERDUE AIRCRAFT *(Continued)*

Alert Notices (ALNOTs) (Cont'd)
JO 7110.65, par. 10-3-4

⊙ Upon receipt of an Information Request (INREQ) or ALNOT:

- Check position records to determine if the aircraft has contacted your facility.
- Notify the originator within one hour of results or status of records check.
- Retain the alert in active status until cancellation is received.
  - Inform originator of any subsequent contact.

Responsibility Transfer to RCC
JO 7110.65, pars. 10-3-5, 10-3-6

⊙ Transfer responsibility to RCC for further search when:

- 30 minutes have elapsed after estimated fuel exhaustion time, or
- Aircraft has not been located within one hour after ALNOT issued, or
- ALNOT search was completed with negative results.

⊙ Forward aircraft position plots to RCC or ARTCC, as appropriate.

- Plot flight path of aircraft on a chart, including:
  - Position reports
  - Predicted positions
  - Possible range of flight
  - Any other pertinent data
- Solicit assistance from other aircraft operating near aircraft in distress.

Cancellation
JO 7110.65, par. 10-3-7

⊙ Cancel ALNOT when either:

- The aircraft has been located, or
- Search has been abandoned.

OVERDUE AIRCRAFT *(Continued)*

Traffic Restrictions
JO 7110.65, par. 10-4-1

⊙ Restrict or suspend IFR traffic which could be affected by the overdue or unreported aircraft, unless radar separation is used.

- The facility responsible must restrict or suspend IFR traffic for a period of 30 minutes following the applicable time listed below:
  - The time at which approach clearance was delivered to the pilot
  - The Expect Further Clearance (EFC) time delivered to the pilot
  - The arrival time over the NAVAID serving the destination airport
  - The current estimate, either the control facility's or the pilot's, whichever is later, at:
    - → The appropriate en route NAVAID or fix, and
    - → The NAVAID serving the destination airport
  - The release time and, if issued, the clearance void time

Traffic Resumption
JO 7110.65, par. 10-4-3

⊙ Resume normal air traffic control after 30-minute traffic suspension has expired if operators or pilots of other aircraft concur.

- Concurrence must be maintained for an additional 30 minutes after suspension period has expired.

Review

◈**QUESTION:** When is an aircraft considered to be overdue?

ANSWER: *When neither communications nor radar contact can be established, and 30 minutes have passed since the aircraft's clearance void time or ETA over a compulsory reporting point or clearance limit.*

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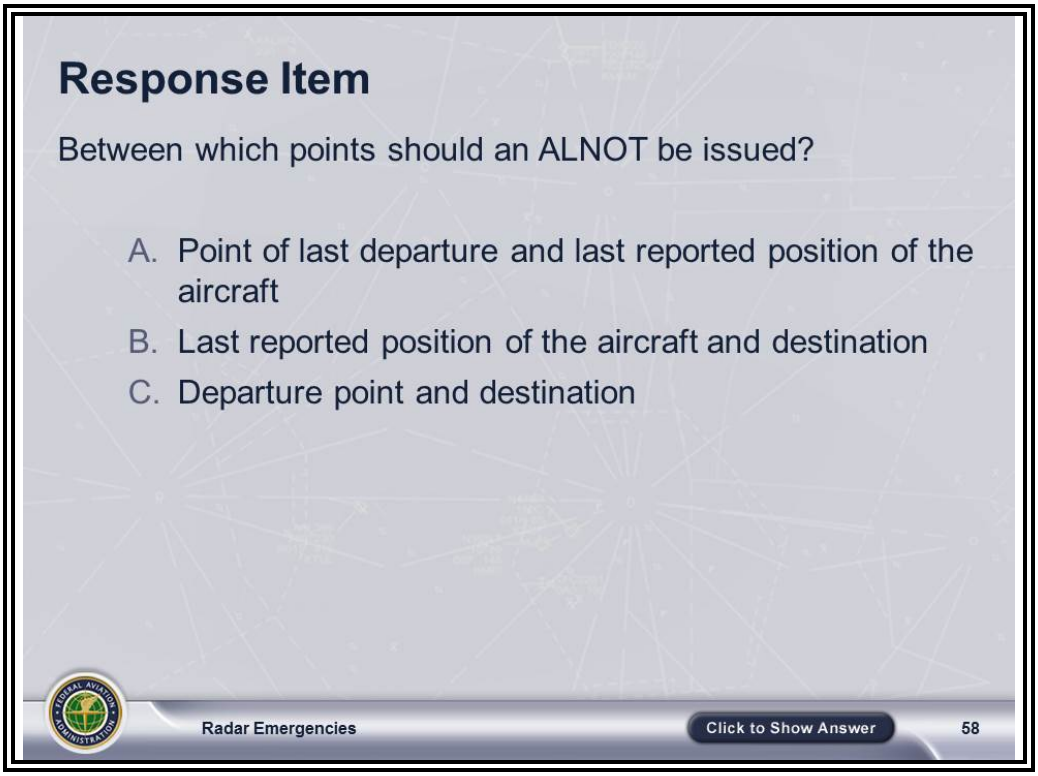
OVERDUE AIRCRAFT *(Continued)*

Review (Cont'd)



SLIDE ANSWER: B

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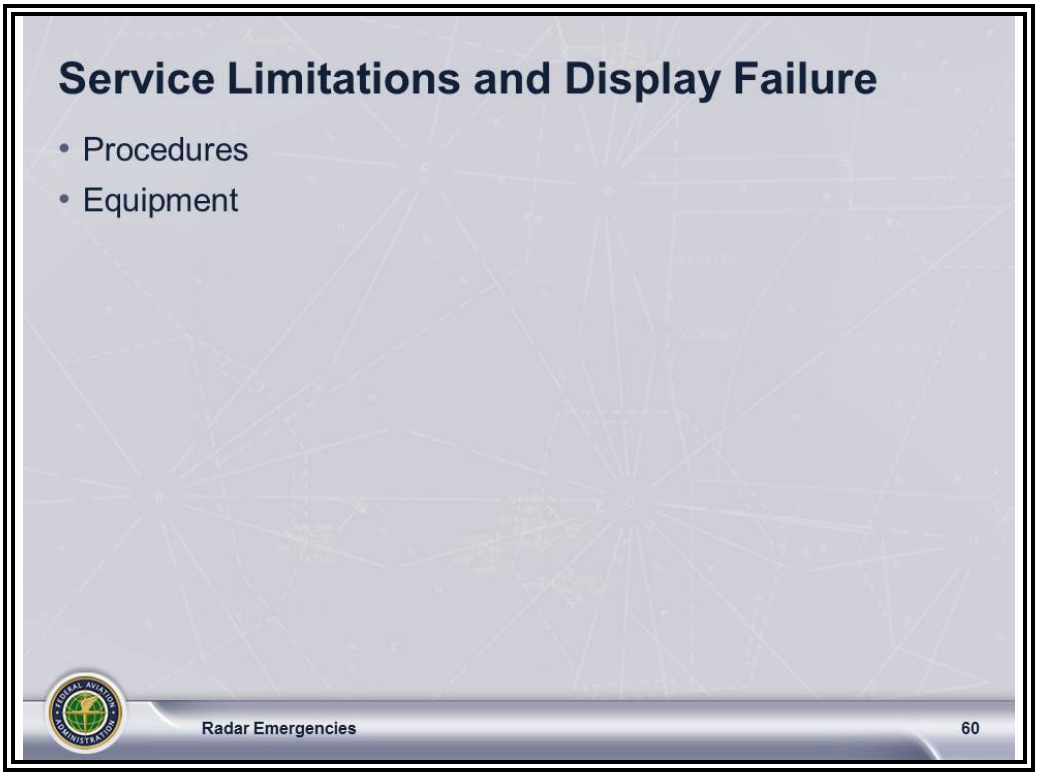
OVERDUE AIRCRAFT *(Continued)*

Review (Cont'd)

SLIDE ANSWER: C

SERVICE LIMITATIONS & DISPLAY FAILURE

Procedures
JO 7110.65,
par. 5-1-6;
TI 6110.107,
Page i



- When the position symbol of the data block falls more than one history behind the aircraft target (or there is no target symbol displayed):
  - Do **NOT** use the Mode C readout in the FDB for separation purposes.
- Observe the Outage and Status Views to identify which Channel is experiencing the outage and utilize that information in preparing resolution.
  - Be aware that the Backup Channel outage messages may cause symptoms on the Active Channel.

Continued on next page

SERVICE LIMITATIONS & DISPLAY FAILURE

Procedures (Cont'd)
JO 7110.65, par. 5-1-6; TI 6110.107, Page i

⊙ Switch to the Backup Channel and then report outage for the following:

- "Not Receiving Surveillance Data" Banner
- Flight Data Down (will appear in the Outage View)
- CA Down and/or MCI Down and/or EM (E-MSAW) Down (will also appear in the Outage View)
- Position Failure: Radar (Red X, Blank or BARCO Screen)

NOTE: These are displayed directly on the Situation Display.

⊙ Report malfunction immediately to ensure:

- Corrective action
- Dispatch of NOTAMs

⊙ Advise adjacent ATC facilities when appropriate.

⊙ Advise your FLM/CIC of any outages in the Outage View.

Equipment
JO 7110.65, pars. 5-1-3, 5-2-15, 5-3-3; JO 7110.310B

⊙ When complete ground equipment failure occurs:

- Revert to non-radar separation.

⊙ When only the ground interrogator appears to be inoperative/ malfunctioning:

- Inform aircraft concerned.

✈ **Phraseology**

"(Name of facility or control function) BEACON INTERROGATOR INOPERATIVE/MALFUNCTIONING."

- Use primary radar identification methods.

Continued on next page

SERVICE LIMITATIONS & DISPLAY FAILURE *(Continued)*

Equipment (Cont'd)
JO 7110.65, pars. 5-1-3, 5-2-15, 5-3-3; JO 7110.310B

⊙ When primary radar failure (search) occurs:

- May use secondary radar (beacon) as sole display source:
  - In Class A airspace
  - Outside Class A or where a mix of Class A/non-Class A airspace exists, only when:
    - → Additional coverage is provided by secondary radar beyond that of the primary radar, or
    - → Primary radar outage is temporary and pilots are advised, or
    - → Secondary radar is the only radar source for the area, and if used for separation, the beacon range accuracy is assured as provided in FAA Order JO 7110.65, paragraph 5-1-4.

NOTE: Pilot advisories may be omitted when radar outage information is provided on ATIS and the pilot indicates receipt of the ATIS broadcast.

✈ **Phraseology**

"PRIMARY RADAR UNAVAILABLE (describe location). RADAR SERVICES AVAILABLE ON TRANSPONDER EQUIPPED AIRCRAFT ONLY."

- Use beacon identification methods.

⊙ ADS-B:

- ADS-B will be integrated as a supplemental surveillance source in areas in which radar surveillance is available.
  - Accordingly, targets derived from ADS-B information will only be displayed if the preferred radar is temporarily not available.
  - ADS-B-only targets will not be displayed in areas that are not within existing radar coverage.
- In a non-radar area where ADS-B targets could be displayed, non-radar separation will be applied between ADS-B targets and non-radar traffic that may be a factor as specified in FAA JO 7110.65, Chapter 6.

NOTE: This does not preclude the application of 5NM radar separation between ADS-B targets where authorized.

SERVICE LIMITATIONS & DISPLAY FAILURE *(Continued)*

Review

QUESTION: Name two reasons a radar malfunction must be reported immediately.

ANSWER: *To ensure corrective action can be started and to ensure NOTAMs can be dispatched.*

COMMUNICATIONS FAILURE

Controller Actions
JO 7110.65, pars. 5-2-8, 10-4-4;
TI 6110.100, par. 4.3.9;
14 CFR Part 91.185

- During communications failure, air traffic control is based on anticipated pilot action.

Click to animate.

- Use all appropriate means available to reestablish communications with the No Radio (NORDO)aircraft, including:
  - NAVAID voice features
  - Flight Service Stations
  - Other aircraft
  - Aeronautical Radio Incorporated (ARINC)
  - Emergency frequency, if warranted
  - Data link, if available

Continued on next page

COMMUNICATIONS FAILURE *(Continued)*

Controller Actions (Cont'd)
JO 7110.65, par. 10-4-4, PCG;
JO 7610.4, par. 7-3-1;
14 CFR Part 91.185

⊙ Attempt to reestablish communications with a radar-identified aircraft by requesting the aircraft to:

- Make turns to acknowledge clearances and answer questions.
- Reply with transponder change to acknowledge clearances and answer questions.
  - Squawk ident
  - Squawk 7600
    → RDOF blinks in the data block
  - Squawk other appropriate stratum code
  - Squawk standby
    → Allow sufficient time to ensure change was caused by pilot action.

✈ **Phraseology**

"REPLY NOT RECEIVED (appropriate instructions)."

"(Action) OBSERVED, (additional instructions/information if necessary)."

⊙ Broadcast clearances for aircraft to proceed to filed alternate airport:

- At MEA
- If aircraft operator concurs

⊙ If radio communications have not been reestablished with the aircraft after five minutes, consider the aircraft activity to be suspicious and handle the flight per FAA Order JO 7610.4, Chapter 7, Hijacked/ Suspicious Aircraft Reporting and Procedures.

⊙ After radio communications have been reestablished with the NORDO aircraft, the FLM/CIC may relay a request for a "confidence maneuver" to ensure that the pilot-in-command is able to receive and comply with ATC instructions.

COMMUNICATIONS FAILURE *(Continued)*

Pilot Actions
JO 7110.65, par. 10-4-4; AIM, pars. 6-4-1 thru 6-4-3; 14 CFR Part 91.185

⊙ During communications failure, pilot must:

- Adjust transponder to reply Mode 3/A code 7600.
- If in VFR conditions proceed VFR and land as soon as practicable:
  - Exist when radio failure occurs
  - Are encountered after the failure
- If in IFR conditions or Class A airspace proceed via:
  - Routing last assigned
  - Direct to fix, route, or airway specified in vector clearance:
    - → When radio failure occurs during a vector
  - Routing ATC advised to expect in a further clearance:
    - → In the absence of an assigned route
  - Route filed in flight plan:
    - → If route was not assigned and ATC has not advised a route to expect
  - Maintain the highest of the following altitudes for the route segment being flown:
    - → Last assigned
    - → Minimum altitude/flight level for IFR operations
    - → Altitude/flight level ATC advised to expect
  - Depart the clearance limit:
    - → If an approach fix, as close as possible to either:
      - o EFC time, or
      - o ETA (if no EFC has been received)
  - If other than approach fix:
    - → At EFC or upon arrival at fix, so as to commence approach as close as possible to ETA
- Attempt to reestablish radio contact:
  - With FSS or ARINC
  - On previously assigned frequency
- Monitor NAVAID voice feature.

COMMUNICATIONS FAILURE *(Continued)*

Review

SLIDE ANSWER: B

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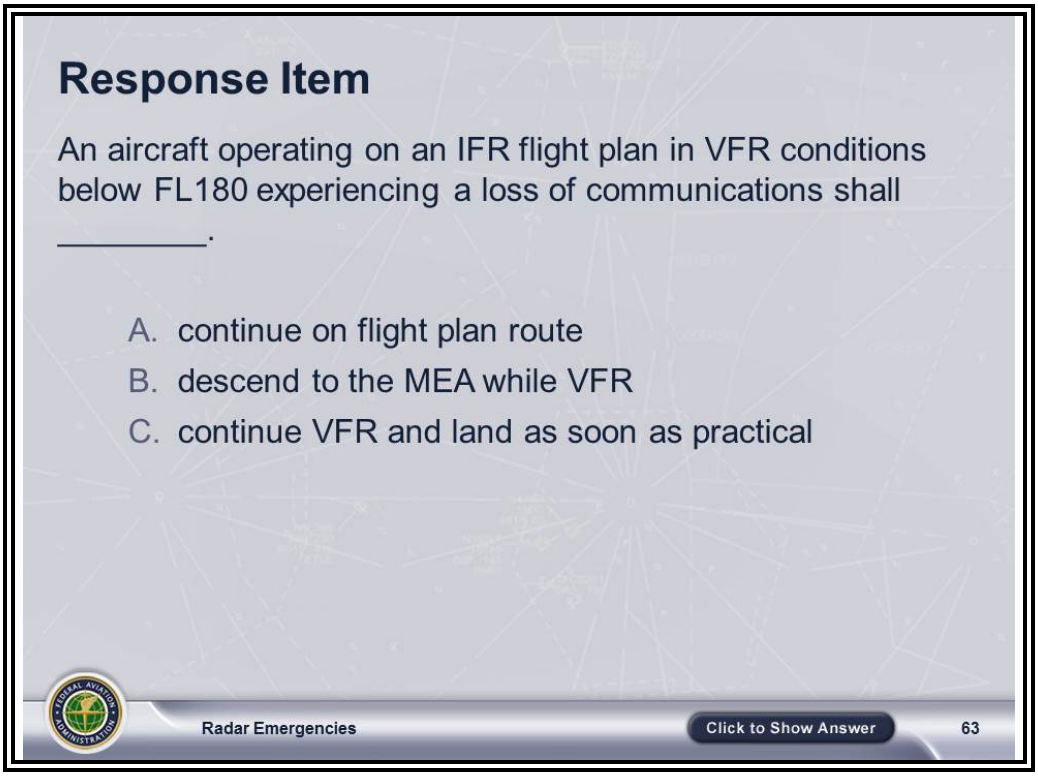
COMMUNICATIONS FAILURE *(Continued)*

Review (Cont'd)



SLIDE ANSWER: C

CONCLUSION

Summary

⊙ Review

☞ ***NOTE:*** *Review and elaborate briefly on the following:*

- General Emergency Information
- Emergency Situations
- Emergency Assistance
- Unusual Situations
- Overdue Aircraft
- Radar Failure
- Communications Failure

☞ ***NOTE:*** *Ask students if there are any questions.*

End-of-Lesson Test

⊙ Your instructor will now administer the End-of-Lesson Test.

☞ ***NOTE:*** *Distribute and administer the End-of-Lesson Test located in 55055-ELT12.*