

BASICS FOR AIR TRAFFIC CONTROL – SEARCH AND RESCUE (SAR)

MODULE OVERVIEW

Purpose: The purpose of this module is to cover Search and Rescue (SAR) responsibilities, handling, and procedures. It also covers the actions taken when an aircraft becomes unreported, overdue, or missing.

MODULE OUTLINE

Lesson: Search and Rescue (SAR) Responsibilities

Purpose: The purpose of this lesson is to cover responsibilities to conduct effective civil search and rescue missions.

Objective:

- Identify Search and Rescue (SAR) responsibilities to conduct effective civil SAR missions

Topics:

- Purpose of National Search and Rescue Plan
 - Overdue
 - Unreported
 - Missing
- Search and Rescue Facility
- Knowledge Check
- Roles and Responsibilities:
 - FAA SAR Facility Responsibility
 - Military Responsibility
 - Rescue Coordination Centers (RCCs)
- Knowledge Check
- Review/Summary

Question and Answer Session – *Parking Lot*

Lesson: Overdue Aircraft Procedures

Purpose: The purpose of this lesson is to cover procedures for reporting unreported, overdue, or missing aircraft.

Objective:

- Identify procedures for reporting unreported, overdue, or missing aircraft

Topics:

- Initiating Search and Rescue Service
 - VFR Flight Plan
 - IFR Flight Plan
 - No Flight Plan
- Search and Rescue Terminology
- Information to be Forwarded to ARTCCs by Terminal Facilities
- Information to be Forwarded to RCC by ARTCCs

- Issuance of Alert Notice (ALNOT)
 - ALNOT Search Area
 - Responsibility Transfer to RCC
 - Cancellation of ALNOT
- Knowledge Check
- Review/Summary

Question and Answer Session – *Parking Lot*

Exercise – IFR Search and Rescue Matrix

Question and Answer Session – *Parking Lot*

End-of-Module (EOM) Test

INTRODUCTION

LESSONS	<ul style="list-style-type: none">■ Search and Rescue (SAR) Responsibilities■ Overdue Aircraft Procedures
TOTAL ESTIMATED RUN TIME	2 hrs. 07 mins.
MODULE CONTENT	<ul style="list-style-type: none">■ Module Overview■ Lesson: Search and Rescue (SAR) Responsibilities■ Q&A Session – Parking Lot■ Lesson: Overdue Aircraft Procedures■ Q&A Session – Parking Lot■ Exercise – IFR Search and Rescue Matrix■ Q&A Session – Parking Lot■ End-of-Module Test

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
<ul style="list-style-type: none">■ Instruct students to select the Search and Rescue (SAR) module link within Blackboard■ Instruct students to read the module introduction and then wait quietly for additional instructions	Blackboard
	EST. RUN TIME
	2 mins.

There are a large number of civil aircraft that fly our airspace. Each aircraft is operated by pilots with various levels of flying experience. Occasionally, one of them flies off course, is overdue, or experiences a mechanical or medical emergency. Depending on the situation, a search and rescue mission may be required. The Federal Aviation Administration (FAA), along with a cooperative effort of various agencies, plays a part in assisting pilots in need of help.

The purpose of this module is to cover Search and Rescue (SAR) responsibilities, handling, and procedures. It also covers the actions taken when an aircraft becomes unreported, overdue, or missing.



FACILITATOR INSTRUCTIONS	DELIVERY METHOD
<ul style="list-style-type: none"> ■ ENABLE <i>Search and Rescue (SAR) Responsibilities</i> lesson in Blackboard ■ Instruct students to navigate to the <i>Search and Rescue (SAR) Responsibilities</i> lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed 	Blackboard
	EST. RUN TIME
	15 mins.

SEARCH AND RESCUE (SAR) RESPONSIBILITIES

Purpose: This lesson covers responsibilities to conduct effective civil search and rescue missions.

Objective:

- Identify Search and Rescue (SAR) responsibilities to conduct effective civil SAR missions

References for this lesson are as follows:

- FAA Order JO 7110.10, Flight Services
- FAA Order JO 7110.65, Air Traffic Control
- Aeronautical Information Manual (AIM)
- National Search and Rescue Plan

Purpose of National Search and Rescue Plan

National Search and Rescue Plan – An interagency agreement which provides for the effective utilization of all available resources in all types of civil SAR missions.



Search and Rescue – A service which seeks missing aircraft and assists those found to be in need of assistance. It is a cooperative effort using the facilities and services of available Federal, state, and local agencies.

Note: *The U.S. Coast Guard is responsible for coordination of search and rescue for the Maritime Region, and the U.S. Air Force is responsible for search and rescue for the Inland Region. Information pertinent to search and rescue should be passed through any air traffic facility or be transmitted directly to the Rescue Coordination Center by telephone.*

Overdue

Overdue describes an aircraft that has failed to report and the appropriate time frame has elapsed (30 minutes or 1 hour).

Unreported

Unreported refers to the time between when an aircraft should have reported a compulsory reporting point until it is considered overdue.

Missing

Aircraft are considered **missing** after the communications search has failed to locate the aircraft.



Search and Rescue Facility

A **search and rescue facility** is responsible for maintaining and operating a SAR service to render aid to persons and property in distress.

It is any SAR unit, station, NET, or other operational activity which can be usefully employed during an SAR Mission; e.g., a Civil Air Patrol Wing, or a Coast Guard Station.

Examples include but are not limited to:

- Flight Service Stations (FSSs)
- Civil Air Patrol
- Rescue Coordination Centers (RCCs)
- USCG
- Local Law Enforcement



Knowledge Check A

REVIEW what you have learned so far about SAR responsibilities. ANSWER the questions listed below.

1. A provision for the effective utilization of all available facilities for SAR missions is called a/an _____.
(Select the correct answer.)
 - ☐ Search and Rescue Facility
 - ☒ **National Search and Rescue Plan**
 - ☐ Rescue Coordination Center
2. An aircraft that has failed to report and the appropriate time frame has elapsed describes a/an _____.
(Select the correct answer.)
 - ☐ Unreported
 - ☒ **Overdue**
 - ☐ Missing

Roles and Responsibilities: Federal Aviation Administration

Under the National Search and Rescue Plan, the Federal Aviation Administration (FAA):

- Provides emergency service(s) to aircraft in distress
- Ensures that SAR procedures are initiated if an aircraft is overdue or missing
- Attempts to locate aircraft through communications search via the:
 - ATC system for Instrument Flight Rules (IFR) aircraft
 - Flight plan program for Visual Flight Rules (VFR) aircraft

FAA SAR Facility Responsibility

TYPE OF FACILITY	FACILITY RESPONSIBILITIES
FSS	<p>Flight Service Station (FSS) initiates SAR procedures for overdue or missing aircraft:</p> <ul style="list-style-type: none">■ On a VFR flight plan■ Where no flight plan has been filed■ On the VFR portion of a composite VFR/IFR flight plan <p>Note: Composite flight plans are used primarily by the military.</p>
ARTCC	<p>The Air Route Traffic Control Center (ARTCC) initiates SAR procedures for aircraft that are:</p> <ul style="list-style-type: none">■ Overdue or missing on an IFR flight plan■ On a combination VFR/IFR or an airfield IFR flight plan and 30 minutes have passed since the pilot requested IFR clearance, and neither communication nor radar contact can be established■ On a Special VFR clearance■ When an Emergency Locator Transmitter (ELT) signal is received or reported<ul style="list-style-type: none">• ELT testing is done during the first five minutes of the hour. If testing is done outside this time frame, coordination should be accomplished with the nearest FAA Control Tower or FSS

Military Responsibility

The military coordinates and conducts physical SAR operations through RCCs.

- The U.S. Air Force is responsible for SAR for the Inland Region
- The USCG is responsible for coordination of SAR for the Maritime Region



Rescue Coordination Centers (RCCs)

Air Force RCCs

- Tyndall Air Force Base (AFB), FL, is responsible for SAR coordination for the inland region within the contiguous states
- Joint Base Elmendorf-Richardson is responsible for Alaska
- Usually uses civilian resources to conduct physical search, such as Civil Air Patrol and state agencies

Coast Guard (USCG) RCCs

Using various stations around the country, they are responsible for coordination and conducting SAR for the maritime region.

Joint RCCs

Hawaii Joint RCC, located in Honolulu, is responsible for Hawaii.





Knowledge Check B

REVIEW what you have learned so far about SAR roles and responsibilities and RCCs. ANSWER the questions listed below.

- Which facility has initial SAR responsibility for aircraft on a VFR flight plan? (Select the correct answer.)
 - ☐ ARTCC
 - ☐ RCC
 - ☒ **FSS**
- Which facility has SAR responsibility for aircraft on a Special VFR clearance? (Select the correct answer.)
 - ☒ **ARTCC**
 - ☐ RCC
 - ☐ FSS
- Which AFB is responsible for SAR coordination for the inland region of the contiguous states? (Select the correct answer.)
 - ☐ Joint Base Elmendorf-Richardson
 - ☐ Scott AFB
 - ☒ **Tyndall AFB**

Search and Rescue Responsibilities Summary

The National Search and Rescue Plan interagency agreement provides for the effective utilization of all available resources in all types of civil search and rescue missions. This lesson also identified responsibilities which are necessary to conduct an effective search and rescue mission. This service, which seeks missing and assists those in need of assistance, is a cooperative effort for various agencies and is a vital task for the FAA.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
<ul style="list-style-type: none"> Review content presented in Search and Rescue (SAR) Responsibilities lesson Navigate to the Parking Lot link within Blackboard and review any student questions Address Parking Lot questions and facilitate a brief discussion of the lesson content 	Facilitated Discussion
	EST. RUN TIME
	15 mins.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
<ul style="list-style-type: none"> ENABLE Overdue Aircraft Procedures lesson in Blackboard Instruct students to navigate to the Overdue Aircraft Procedures lesson in Blackboard Instruct students to work individually through the lesson content Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed 	Blackboard
	EST. RUN TIME
	15 mins.

OVERDUE AIRCRAFT PROCEDURES

Purpose: This lesson covers procedures for reporting unreported, overdue, or missing aircraft.

Objective:

- Identify procedures for reporting unreported, overdue, or missing aircraft

References for this lesson are as follows:

- FAA Order JO 7110.10, Flight Services
- FAA Order JO 7110.65, Air Traffic Control
- Aeronautical Information Manual (AIM)

Initiating Search and Rescue Service

The initiation of search and rescue (SAR) depends on whether or not a flight plan was filed and activated and the type of flight plan filed. Select each type of flight plan to learn when an aircraft is considered overdue and what your responsibilities are.

- Visual Flight Rules (VFR) flight plans
- Instrument Flight Rules (IFR) flight plans
- No flight plan

Visual Flight Rules (VFR) Flight Plans

An aircraft on a VFR or Defense Visual Flight Rules (DVFR) flight plan is considered overdue 30 minutes after the estimated time of arrival (ETA) and communications or location cannot be established.

- $OVERDUE = ETA + 30 \text{ Minutes}$
- A communications search is initiated by a Flight Service Station (FSS)

Instrument Flight Rules (IFR) Flight Plans

An aircraft on an IFR flight plan is considered overdue when neither communications nor radar contact can be established and 30 minutes have passed since its:

- ETA over a specified or compulsory reporting point or at a clearance limit
- Clearance void time

If you have reason to believe that the aircraft is overdue prior to 30 minutes, take immediate action as required. If an IFR aircraft is determined to be overdue, unreported, or missing, the SAR process starts at this stage.

Note: *The center in whose area the aircraft is first overdue or unreported will make these determinations and is responsible for taking any subsequent action required.*

No Flight Plan

An aircraft with no flight plan is considered overdue at the actual time a reliable source reports it to be at least one hour late at the destination.

- Reliable source may be family member, business associate, fixed base operator, etc.
- A communications search is initiated by an FSS

Search and Rescue Terminology

Information Request (INREQ) is a request originated by FSS for information concerning an overdue VFR aircraft.

Alert Notice (ALNOT) is a request originated by an FSS or ARTCC for an extensive communications search for overdue, unreported, or missing aircraft.



Information to be Forwarded to ARTCCs by Terminal Facilities

When an aircraft is considered to be in emergency status that may require SAR procedures or an IFR aircraft is overdue, the terminal facility shall alert the ARTCC and forward information, as available. Select the arrow to see the information that is required.



- Flight plan, including color or aircraft, if known
- Time of last transmission received, by whom, and frequency used
- Last position report and how determined
- Aircraft beacon code
- Number of persons on board
- Fuel status
- Facility working the aircraft and frequency
- Last known position, how determined, time, estimated present position, and maximum range of flight of the aircraft based on remaining fuel and airspeed
- Position of other aircraft near the aircraft's route of flight, when requested
- Whether or not an ELT signal has been heard or reported in the vicinity of the last known position
- Other pertinent information

Information to be Forwarded to RCC by ARTCCs

When an aircraft is considered to be in emergency status or an IFR aircraft is overdue, the ARTCC must alert RCC and forward the following information, as available. Select the arrow to see the information that is required.



- Facility and person calling
- Flight plan, including color of aircraft, if known
- Time of last transmission received, by whom, and frequency used
- Last position report and how determined
- Aircraft beacon code
- Action taken by reporting facility and proposed action
- Number of persons on board
- Fuel status
- Facility working the aircraft and frequency
- Last known position, how determined, time, estimated present position, and maximum range of flight of the aircraft based on remaining fuel and airspeed
- Position of other aircraft near the aircraft's route of flight, when requested
- Whether or not an ELT signal has been heard or reported in the vicinity of the last known position
- Other pertinent information

Issuance of Alert Notice (ALNOT)

In addition to routing to the Regional Operations Center (ROC) for the area in which the facility is located, issue an ALNOT to all centers and all concerned facilities generally 50 miles on either side of the route of flight from the last reported position to destination.

- Include the original or amended flight plan, as appropriate, and the last known position of the aircraft
- The search area may be expanded to the maximum range of the aircraft
- All information about the overdue aircraft is included in the ALNOT to assist in search activities




Note: An ALNOT must be issued before the RCC can begin SAR operations.

- Upon receipt of an INREQ or ALNOT, check the position records to determine whether the aircraft has contacted your facility
 - Notify the originator of the results or status of this check within one hour of the time the alert was received
 - Retain the alert in an active status, and immediately notify the originator of subsequent contact, until cancellation is received






ALNOT Search Area

Include pertinent information in the ALNOT that will aid the RCC and SAR teams in conducting the SAR mission. When known, include:

Last known position	
Time	
Aircraft beacon code	

Responsibility Transfer to RCC

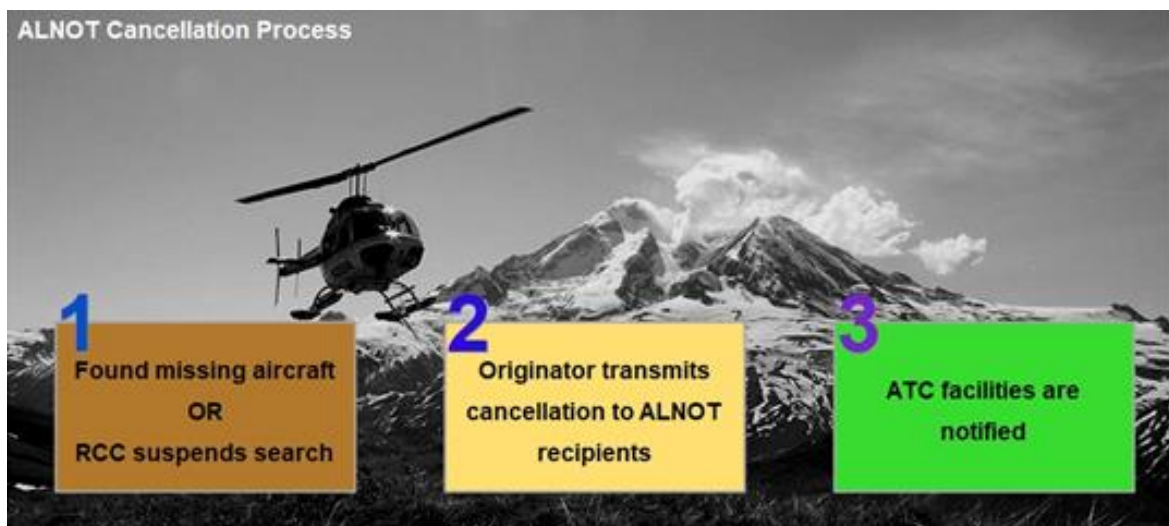
Transfer of search responsibility to RCC occurs when:

The ALNOT search has been completed with negative results	
The aircraft has not been located within one hour after ALNOT issuance	
Thirty minutes have elapsed after the estimated aircraft fuel exhaustion time	

Cancellation of ALNOT

The ALNOT remains active until the aircraft is located or RCC suspends the search.

- The ALNOT originator then transmits a cancellation message with the location of the aircraft, if found, to all recipients of the ALNOT
- ATC facilities are notified





Knowledge Check C

REVIEW what you have learned so far about conducting SAR procedures for overdue aircraft. ANSWER the questions listed below.

- When is an aircraft on an IFR flight plan considered overdue? *(Select the correct answer.)*
 - ☐ Communication cannot be established over a mandatory reporting point
 - ☐ Radar contact cannot be established within 30 minutes of an aircraft's ETA
 - ☐ **30 minutes have passed since ETA over a reporting point or clearance limit and neither communication nor radar contact can be established**
 - ☐ Not until FSS initiates a SAR
- When is an aircraft on a VFR flight plan considered overdue? *(Select the correct answer.)*
 - ☐ At the actual time a reliable source reports it to be at least one hour late
 - ☐ Communication or radar cannot be established
 - ☐ **30 minutes after the ETA and communication or location cannot be established**
 - ☐ 30 minutes have passed since ETA over a reporting point
- When an aircraft is in emergency status and may require SAR procedures, what information must you forward to the ARTCC? *(Select all correct answers that apply.)*
 - ☐ **Last position report and how determined**
 - ☐ **Number of persons on board**
 - ☐ Information from last transmission received
 - ☐ **Aircraft beacon code**
 - ☐ **Fuel Status**
- When an aircraft is considered to be in emergency status, which of the following information is the ARTCC **NOT** required to send to an RCC? *(Select the correct answer.)*
 - ☐ Flight plan, including color of aircraft, if known
 - ☐ Time of last transmission received, by whom, and frequency used
 - ☐ Number of persons on board
 - ☐ **Next position report**
 - ☐ Aircraft beacon code

Overdue Aircraft Procedures Summary

It is important to understand the point at which action must be taken to initiate a search and rescue. This lesson identified procedures for reporting unreported, overdue, or missing aircraft. This knowledge is vital to the FAA regarding the safety and livelihood of the aircraft in your care.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
<ul style="list-style-type: none"> Review content presented in Overdue Aircraft Procedures lesson Navigate to the Parking Lot link within Blackboard and review any student questions Address Parking Lot questions and facilitate a brief discussion of the lesson content 	Facilitated Discussion
	EST. RUN TIME
	10 mins.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
<ul style="list-style-type: none"> Instruct students to locate student exercise IFR Search and Rescue Matrix Worksheet in the printed Student Guide Instruct students to read the SAR Narrative included in the worksheet and then answer the associated question based off the reading Randomly select students to read aloud their answers to questions Evaluate student responses, provide feedback and generate class discussion 	Exercise
	EST. RUN TIME
	20 mins.

EXERCISE: IFR SEARCH AND RESCUE MATRIX

Purpose

This exercise is to help you become familiar with the search and rescue (SAR) process for aircraft on an IFR flight plan.

Directions

Read the **SAR Narrative**. Using the Search Matrix, answer the questions below.

Detailed Facilitator Instructions: Direct students to read **SAR Narrative** to answer the questions on the following page. After completion, review student responses with students. Encourage student discussion as to why or how they arrived with their responses.

Search Matrix	
PHASE OF SEARCH	AREA SEARCHED
INREQ	All airports along the route of flight that can accommodate the aircraft
ALNOT	The area extending 50 miles on either side of the route of flight from the last reported position to the destination
Question	Answer
1. At what time should an ALNOT message have been sent in reference to N2811H?	<u>When the controller noticed the data block blink erratically then disappear, and attempts to contact the aircraft by radio were unsuccessful.</u>
2. To whom should the ALNOT message have been sent?	<u>To ARTCC circuit codes within the area of 50 NM either side of the route of flight from the last reported position to the destination, plus the RCC and ROC.</u>
3. What action should the stations receiving the ALNOT message have taken?	<u>A check of traffic files at each air traffic facility and a visual check of all flight lines at all airports within 50 NM either side of the route of flight.</u>
4. What was the role of the RCC?	<u>To coordinate and conduct the physical search for the aircraft.</u>
5. Who was responsible for canceling the ALNOT?	<u>The facility that issued the ALNOT (Albuquerque Center).</u>

SAR Narrative

An advancing cold front had created a large area of clouds across the eastern plains of New Mexico and extreme western Texas. Many locations were reporting IFR ceilings. The forecast for the area showed little improvement until the slow-moving front passed by.

The pilot of N2811H, a Piper Cherokee, had to make a flight; an important business meeting in Albuquerque had been scheduled at the last minute. The pilot felt that flying in a rental would be easier than trying to get a ticket on an airline. Licensed and current in IFR operations, the pilot was confident in his abilities for a long cross-country flight. The flight across New Mexico would take N2811H along V402 to Tucumcari (TCC), then V12 to Albuquerque (ABQ).

Shortly after N2811H turned west onto V12, the Albuquerque Center (ZAB) sector controller noticed that the data block for N2811H was blinking erratically. Then it disappeared completely. Attempts to contact the aircraft by radio were unsuccessful. The sector controller notified the supervisor. The supervisor then advised the operations manager in charge of operations. An emergency was declared, and an ALNOT was issued to notify all affected Air Traffic facilities of the disappearance of N2811H.

The ALNOT started an immediate communication search of all airports and Air Traffic facilities between TCC and ABQ. ABQ FSS made many phone calls to all the small airports scattered across the eastern plains of New Mexico. The RCC alerted the Civil Air Patrol (CAP), who then alerted pilots and observers for air searches. Cannon AFB was also alerted. The State Highway Patrol was notified, as were county sheriff's offices along the route. A vast army of people had been formed in a short period, all looking for N2811H. Traffic files and flight lines were checked. Deputies and troopers kept their eyes open while patrolling their areas. Controllers in different facilities listened for that important call sign to call.

Approximately 35 minutes after the ALNOT went out, ABQ FSS received a phone call on its 800 briefing line. The pilot of N2811H reported that he was safely on the ground at Sandia Airpark (NM51). An electrical failure had shut down the instruments, radios, and transponder. Flying above the clouds, the pilot used the magnetic compass, charts, and a cool head to continue west. Breaks in the clouds revealed an airport. The pilot carefully descended through the break and landed safely.

ABQ FSS immediately sent this information to ZAB. With the aircraft located, ZAB canceled the ALNOT. The word was spread among those searching, and people went back to their normal routines.

SUMMARY

This purpose of this module was to cover Search and Rescue (SAR) responsibilities, handling, and procedures. It also covered the actions taken when an aircraft becomes unreported, overdue, or missing.

In accordance with FAA Order JO 7110.10, Flight Services; FAA Order JO 7110.65, Air Traffic Control; Aeronautical Information Manual (AIM); and National Search and Rescue Plan; you should now be able to:

- Identify Search and Rescue (SAR) responsibilities to conduct effective civil SAR missions
- Identify procedures for reporting unreported, overdue, or missing aircraft

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
<ul style="list-style-type: none">■ Navigate to the Parking Lot link within Blackboard and review any student questions■ Address Parking Lot questions and facilitate a brief discussion of the lesson content■ Instruct students to prepare for the End-of-Module test by putting away their Student Guides	Facilitated Discussion
	EST. RUN TIME
	15 mins.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
<ul style="list-style-type: none">■ ENABLE Search and Rescue (SAR) End-of-Module Test link in Blackboard■ Instruct students:<ul style="list-style-type: none">○ Clear desks○ Do not write anything during or after the test○ Navigate to the Search and Rescue (SAR) End-of-Module Test link in Blackboard○ Once they are satisfied with their responses, click “Save and Submit;” do not click “OK” to review results until directed to do so○ Choose “Cancel” if they receive a warning message that the test has unanswered questions; choosing OK will submit the test and not allow them to go back and answer the questions○ Leave the room after submitting the test and return at the “Be Back” time■ Note: <i>This test is scored but not graded</i>■ During test, monitor students to ensure a secure testing environment■ Identify the most commonly missed questions by reviewing student statistics in Blackboard■ Instruct students to click “View Results” when ready to review commonly missed questions■ Review commonly missed questions with students	Blackboard Assessment
	EST. RUN TIME
	10 mins.

END-OF-MODULE TEST (ANSWER KEY)

Note: Test questions in Blackboard are presented to the students in random order. Please be aware the test key question order will not match the student version.

1. Who is responsible for search and rescue for the Inland Region? (Select the correct answer.)

- ☒ **U.S. Air Force**
- ☐ U.S. Coast Guard
- ☐ ARTCC
- ☐ FSS

Reference(s): AIM, Chap. 6

2. An aircraft on a VFR flight plan is first considered _____ 30 minutes after its ETA. (Select the correct answer.)

- ☒ **Overdue**
- ☐ Late
- ☐ Unreported
- ☐ Missing

Reference(s): JO 7110.10, Chap. 8

3. Consider an IFR aircraft overdue and take appropriate action when _____. (Select the correct answer.)

- ☒ **All of the answers**
- ☐ 30 minutes has passed since an ETA over a compulsory reporting point
- ☐ 30 minutes has passed since clearance void time
- ☐ You have reason to believe the aircraft is overdue

Reference(s): JO 7110.65, Chap. 10

4. The transfer of search responsibility to RCC is done _____. (Select the correct answer.)

- ☒ **When the ALNOT search has been completed with negative results**
- ☐ If the aircraft has not been located within 30 minutes after issuance of the ALNOT
- ☐ 1 hour past ETA
- ☐ At fuel exhaustion time plus 1 hour

Reference(s): JO 7110.65, Chap. 10