Federal Aviation Administration

55054003 EN ROUTE RADAR ASSOCIATE CONTROLLER TRAINING PART C: ADVANCED CONCEPTS

Lesson 15: Air Traffic Services

Version: 1.0 2022.08

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LESSON PLAN DATA SHEET

Course Name	En Route Radar Associate Controller Training Part C: Advanced Concepts
Course Number	55054003
Lesson Title	Air Traffic Services
Duration	1 hour, 45 minutes (Includes lesson and ELT)
Version	1.0 2022.08
Reference(s)	JO 7110.65, Air Traffic Control; JO 7210.3, Facility Operation and Administration
Prerequisites	NONE
Handout(s)	NONE
Exercise / Activity	NONE
Scenario Requirements	NONE
Assessments	⊙ YES - Written (Refer to ELT01_L15, print prior to class)
Materials and Equipment	⊙ Pencil and/or pen
Other Pertinent Information	⊙ **Ensure lesson materials are downloaded to the classroom computer** ⊙ This lesson is based on ERAM EAE410 ⊙ The lesson has been reviewed and reflects current orders and manuals as of April 2022

LESSON ICON LEGEND

	Description
	The Activity icon indicates an exercise, lab, or hands-on activity.
	The Discussion Question icon signals a discussion question to be asked to the students.
	The Handout icon indicates a handout is to be distributed to the students.
	The Instructor Note icon is in hidden text and indicates text that is for the instructor only.
	The Multimedia icon indicates a video or audio clip is in the presentation.
	The Phraseology icon indicates that phraseology is in the content.
	The WBT icon indicates a component of web-based training.
	The Click icon indicates a PPT slide with click-based functionality to present additional information.
	The Definition icon indicates a published definition.

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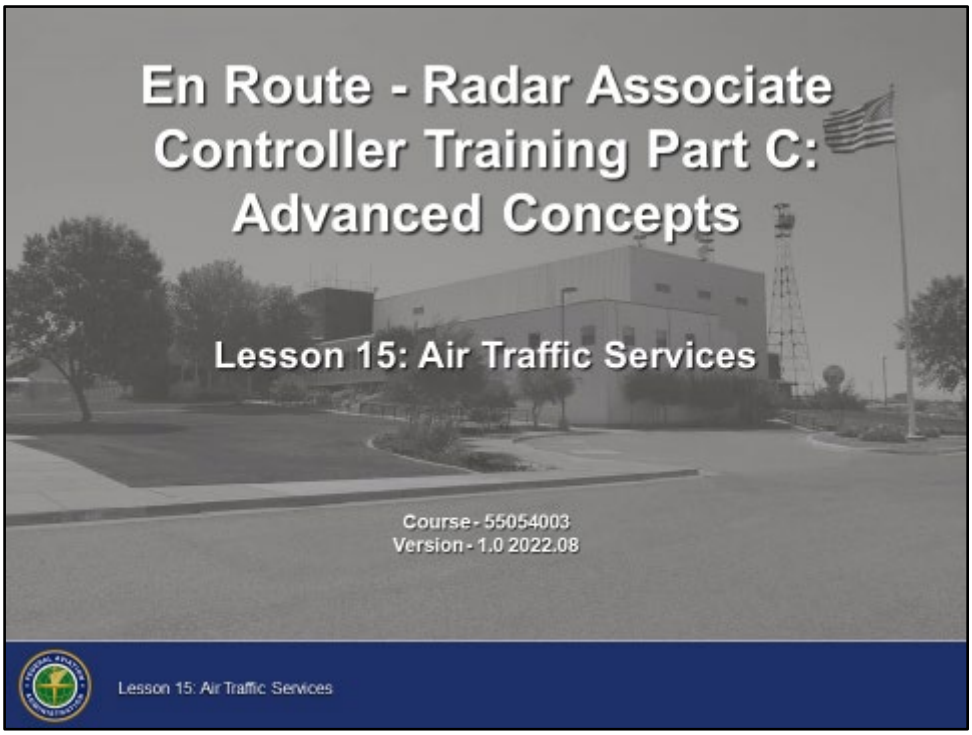
LESSON INTRODUCTION

Overview

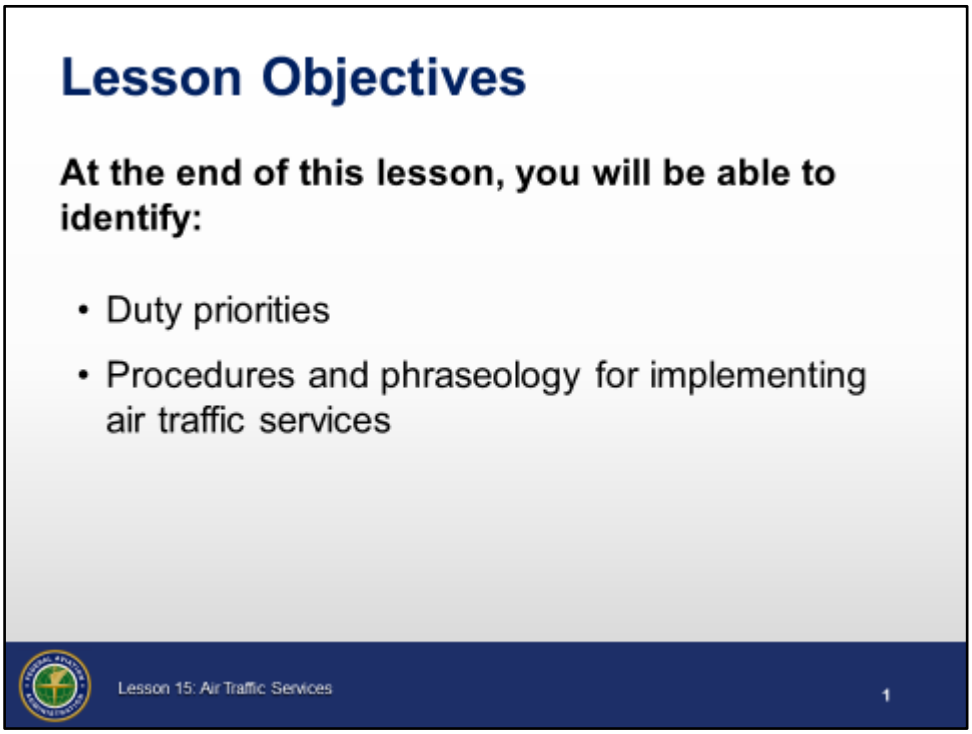


The primary purpose of the Air Traffic Control System is to prevent a collision between aircraft operating in the system; to provide a safe, orderly, and expeditious flow of traffic. In addition, the ATC system provides support for national security and homeland defense.

This lesson will cover additional services such as traffic, deviation and weather advisories, merging target procedures, and holding pattern surveillance.

LESSON INTRODUCTION *(CONT'D)*

Lesson Objectives



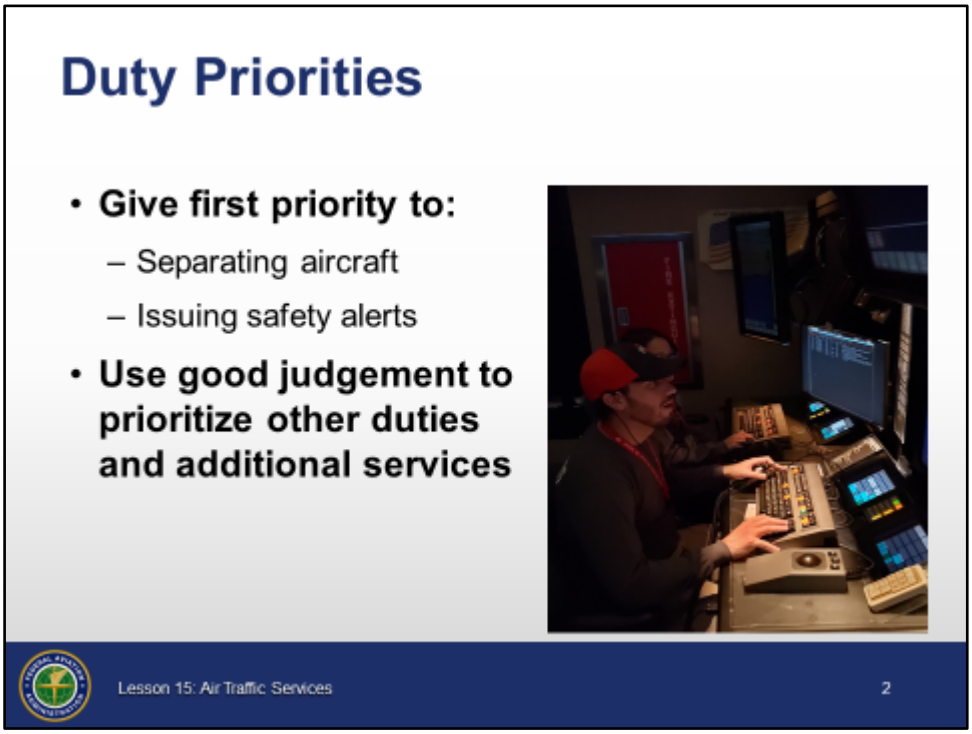
- At the end of this lesson, you will be able to identify:
  - Duty priorities
  - Procedures and phraseology for implementing air traffic services

NOTE: There will be a graded end-of-lesson test upon completion of the lesson. The passing score is 70%. If you do not achieve a score of 70%, you will be provided study time and one retake of an alternate end-of-lesson test.

DUTY PRIORITIES

Priorities

JO 7110.65, par. 2-1-2



- Give first priority to:
  - Separating aircraft
  - Issuing safety alerts
- Use good judgment to prioritize all other duties and additional services based on requirements of the situation at hand
  - Perform actions most critical from a safety standpoint first

DUTY PRIORITIES *(CONT'D)*

Additional Services

JO 7110.65, par. 2-1-2 and PCG

- Provide support to national security and homeland defense activities to include, but not be limited to, reporting of suspicious and/or unusual aircraft/pilot activities
- Provide and/or solicit weather information
  - Weather and chaff information
  - Weather assistance
- Additional services consist of advisory information provided by ATC including, but not limited to:
  - Traffic advisories
  - Vectors, when requested by the pilot, to assist aircraft receiving traffic advisories in avoiding observed traffic
  - Altitude deviation information of 300' or more from an assigned altitude as observed on a verified (reading correctly) automatic altitude readout (Mode C)
  - Advisories that traffic is no longer a factor
  - Bird activity information
  - Holding pattern surveillance

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DUTY PRIORITIES *(CONT'D)*

Additional Services (Cont'd)

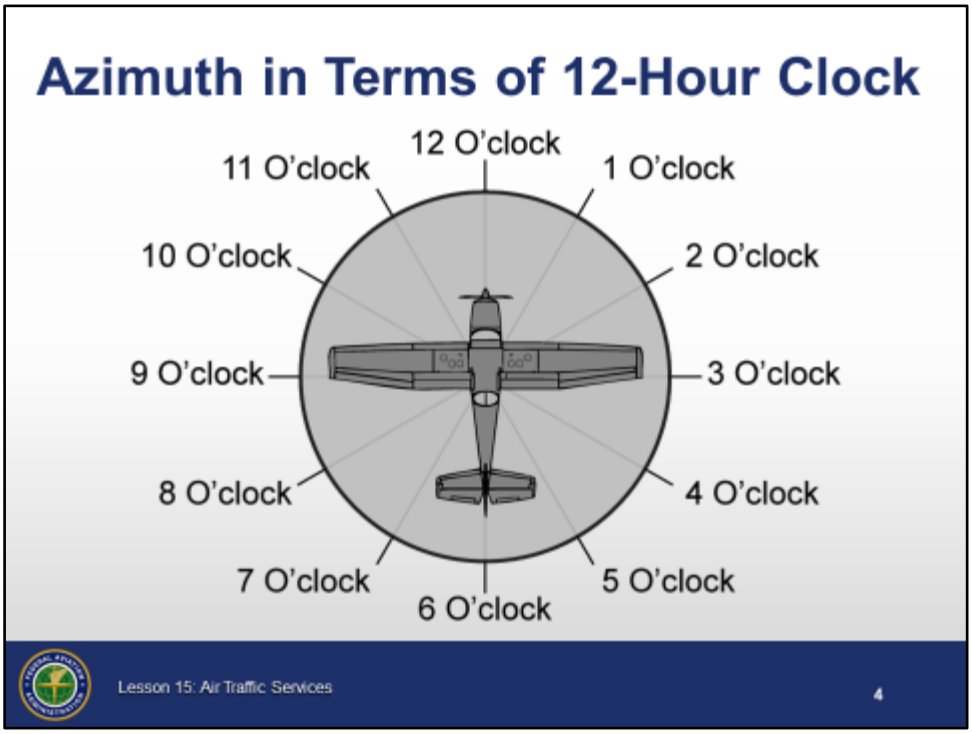
JO 7110.65, pars. 2-1-1, 2-1-2, PCG

- Provide additional services to the extent possible, contingent upon, but not limited to:
  - Higher priority duties
  - Limitations of radar
  - Volume of traffic
  - Frequency congestion
  - Controller workload
  - Physical inability to scan and detect situations falling in this category

  NOTE: Workload limitations will be different for each controller. Each controller should exercise good judgment when determining their limits.
- Controller has complete discretion for determining if they are able to provide or continue to provide a service in a particular case
  - Controller's reason for not providing or continuing to provide a service is not subject to question by the pilot and need not be made known to the pilot
- Additional services are not optional, but rather required when workload permits

Traffic Advisories

JO 7110.65, par. 2-1-21



- Issue traffic advisories to all IFR or VFR aircraft on your frequency when, in your judgment:
  - Proximity may diminish to less than applicable separation minima
  - Proximity warrants it where no separation minima apply, such as:
    - VFR aircraft outside of Class B or Class C airspace, or
    - Terminal Radar Service Areas (TRSA)
  - Exceptions:
    - Aircraft is operating within Class A airspace
    - Pilot requests omission
- Issue the following traffic items to radar-identified aircraft:
  - Position of traffic in terms of the following:
    - Azimuth from aircraft in terms of 12-hour clock, or

Continued on next page

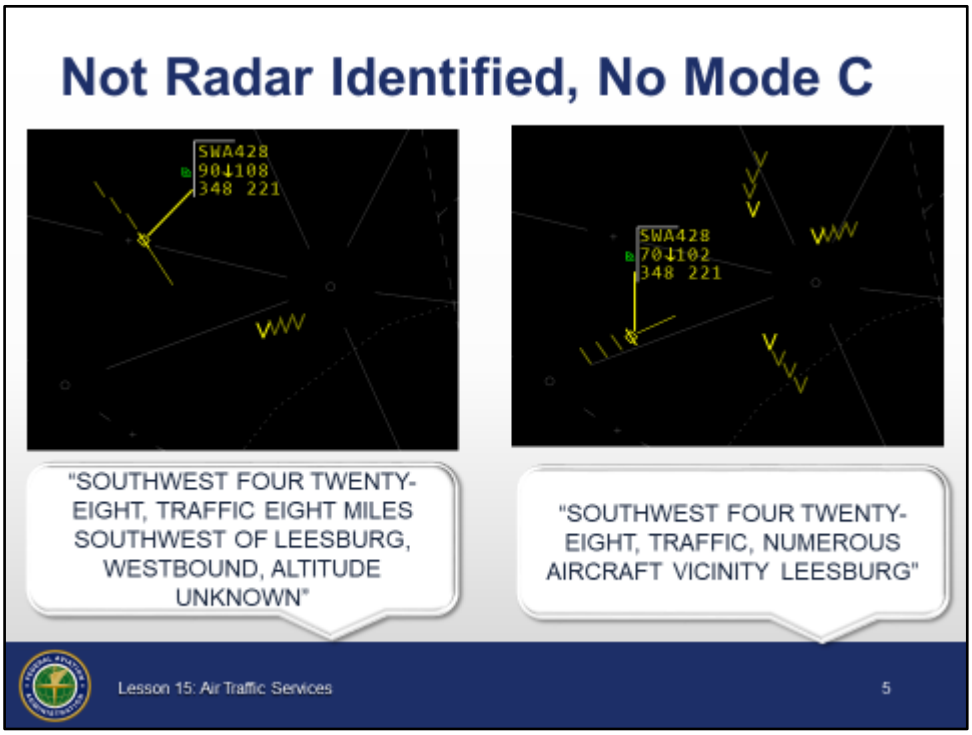
Traffic Advisories (Cont'd)

JO 7110.65, par. 2-1-21

- Direction from aircraft in terms of eight cardinal compass points
  - Used when rapidly maneuvering aircraft prevent accurate issuance of traffic in 12-hour azimuth terms
  - Discontinue at the pilot's request
- Distance from traffic in miles
- Direction in which traffic is proceeding and/or relative movement, including:
  - Closing or converging
  - Parallel same direction
  - Opposite direction or overtaking
  - Diverging
  - Crossing left to right or right to left
- Type of aircraft and altitude, if known

Not Radar Identified

JO 7110.65, par. 2-1-21



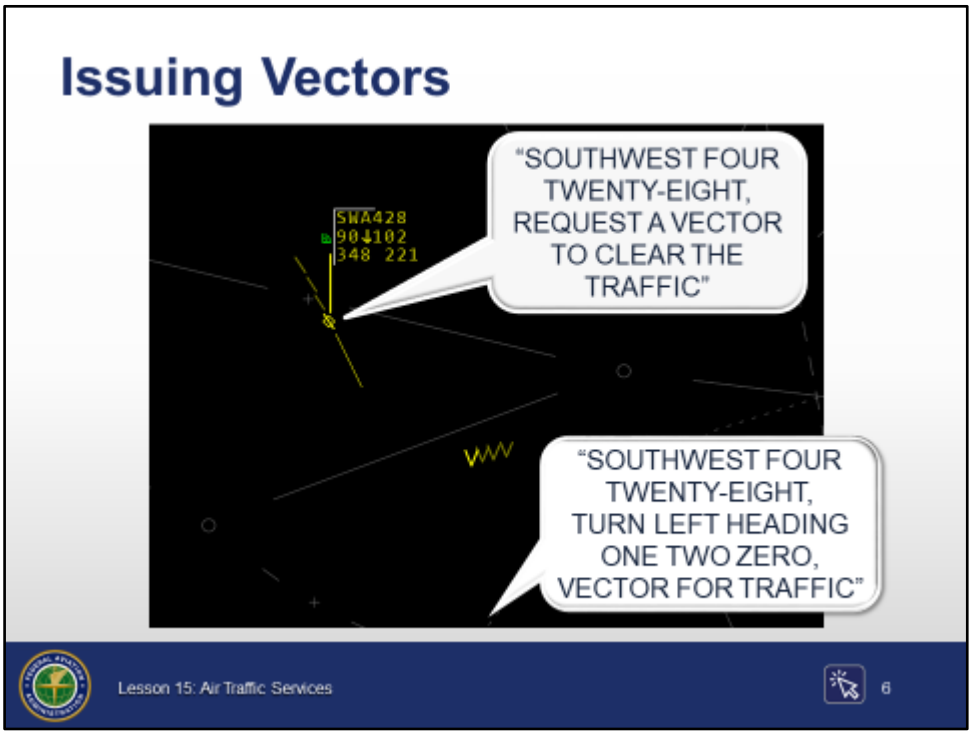
- For aircraft not radar identified and not displaying Mode C, issue these traffic items:
  - Distance and direction from fix
  - Direction traffic is proceeding
  - Type of aircraft and altitude, if known
  - ETA over fix the aircraft is approaching, if appropriate

Examples: "SOUTHWEST FOUR TWENTY-EIGHT, TRAFFIC EIGHT MILES WEST OF LEESBURG, WESTBOUND, ALTITUDE UNKNOWN"

"SOUTHWEST FOUR TWENTY-EIGHT, TRAFFIC, NUMEROUS AIRCRAFT VICINITY LEESBURG"

Issuing Vectors

JO 7110.65, par. 2-1-21

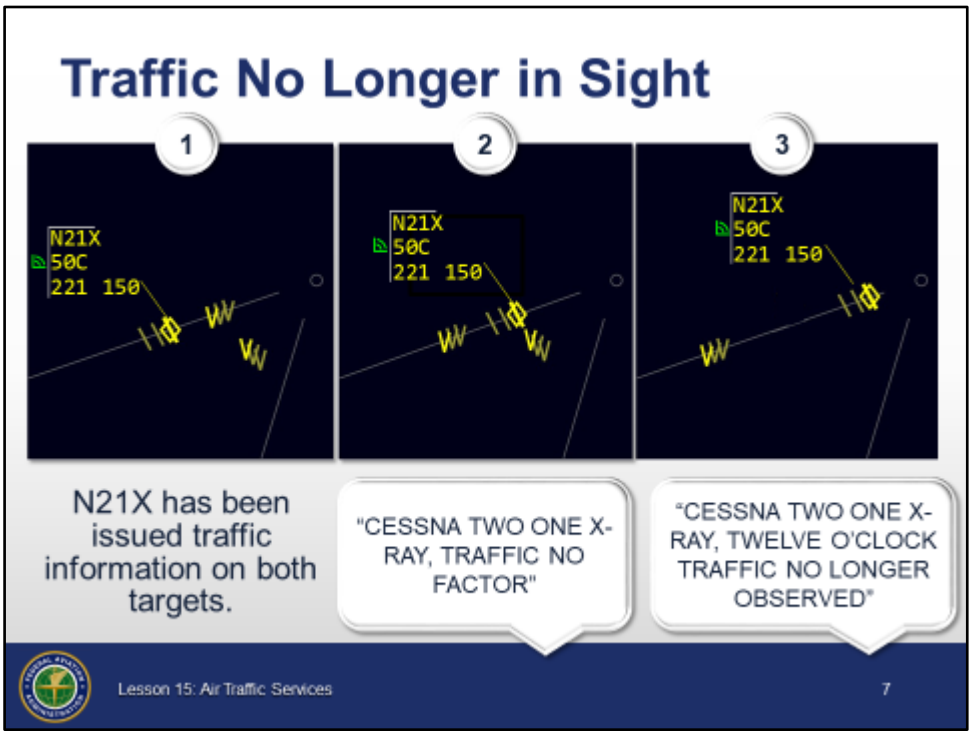


- ⊙ Vector to avoid traffic, if requested by pilot
  - Aircraft must be under your control
    - Unless coordinated
  - Inform the pilot if you are unable to provide a vector

Example: "SOUTHWEST FOUR TWENTY-EIGHT, TURN LEFT HEADING ONE TWO ZERO, VECTOR FOR TRAFFIC"

Traffic No Longer in Sight

JO 7110.65, par. 2-1-21

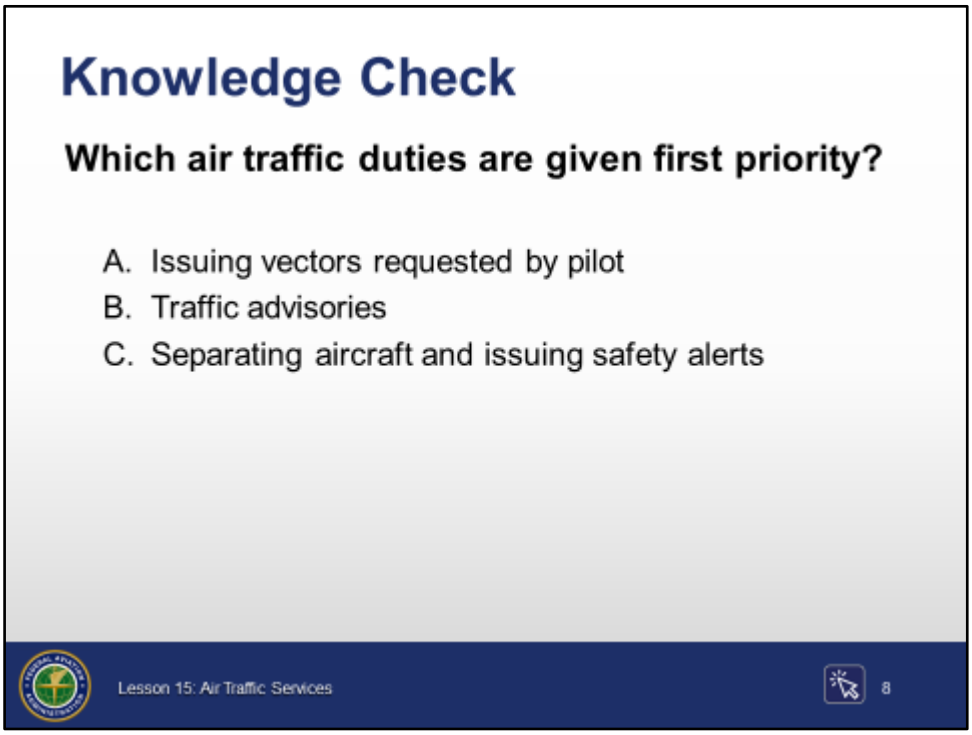


- Inform the pilot of the following when traffic you have issued is not reported in sight
  - Traffic is no factor
  - Traffic is no longer depicted on Situation Display

Examples: "CESSNA TWO ONE X-RAY, TRAFFIC NO FACTOR"

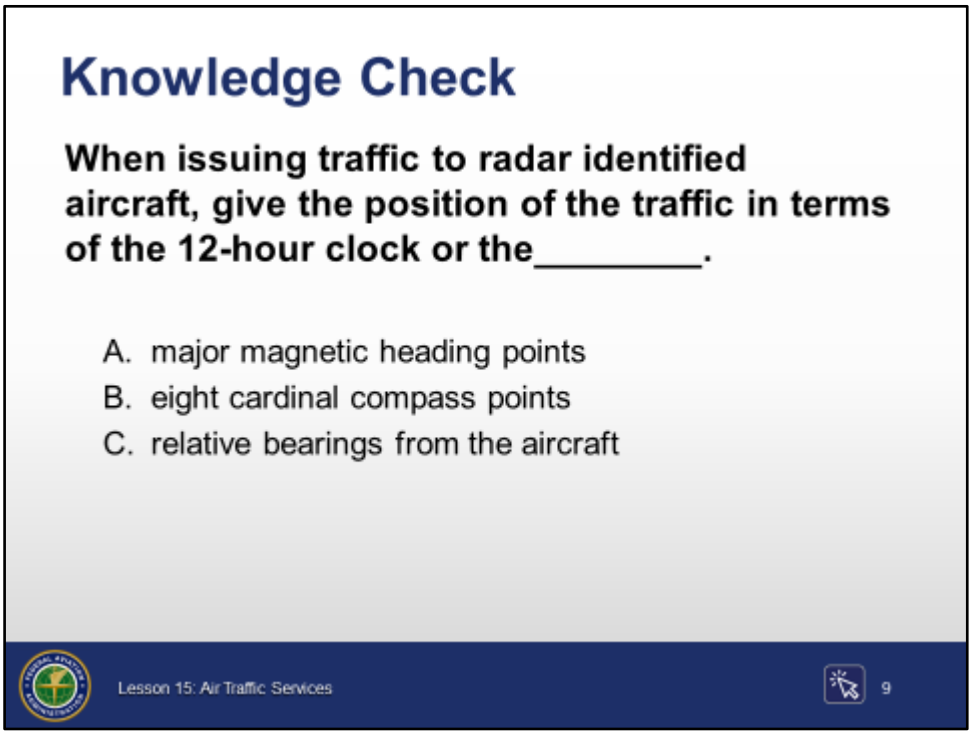
"CESSNA TWO ONE X-RAY, TWELVE O'CLOCK TRAFFIC NO LONGER OBSERVED"

Knowledge Check



Question: Which air traffic duties are given first priority?

Knowledge Check

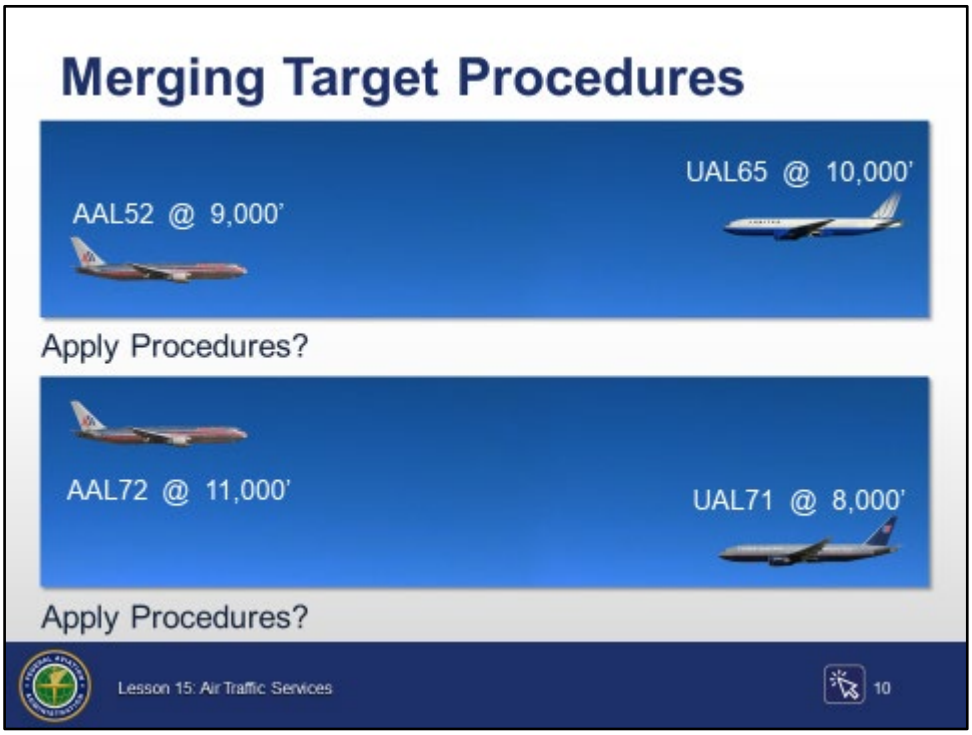


Question: When issuing traffic to radar identified aircraft, give the position of the traffic in terms of the 12-hour clock or the _____.

PROCEDURES AND PHRASEOLOGY *(CONT'D)*

Merging Target Procedures

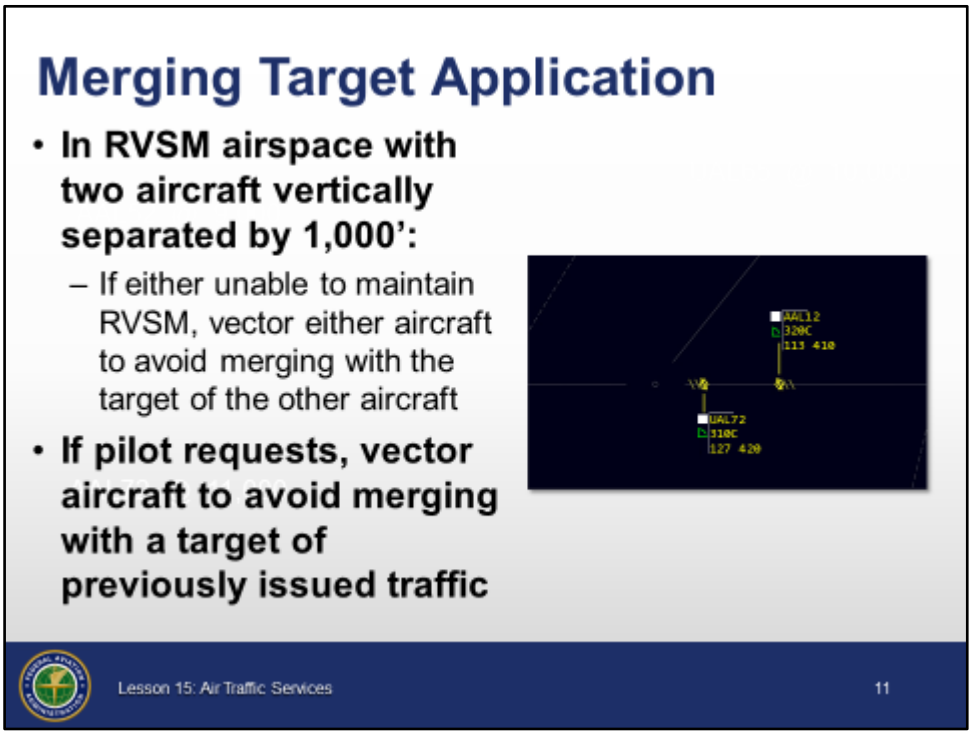
JO 7110.65, par. 5-1-4



- Apply merging target procedures to all radar identified:
  - Aircraft at 10,000' and above
  - Turbojet aircraft, regardless of altitude
  - Presidential aircraft, regardless of altitude
  - Exception:
    - Aircraft established in a holding pattern
- Issue traffic to those aircraft listed above if targets are likely to merge, unless aircraft are separated by more than the appropriate vertical separation minima

Merging Target Application

JO 7110.65, par. 5-1-4



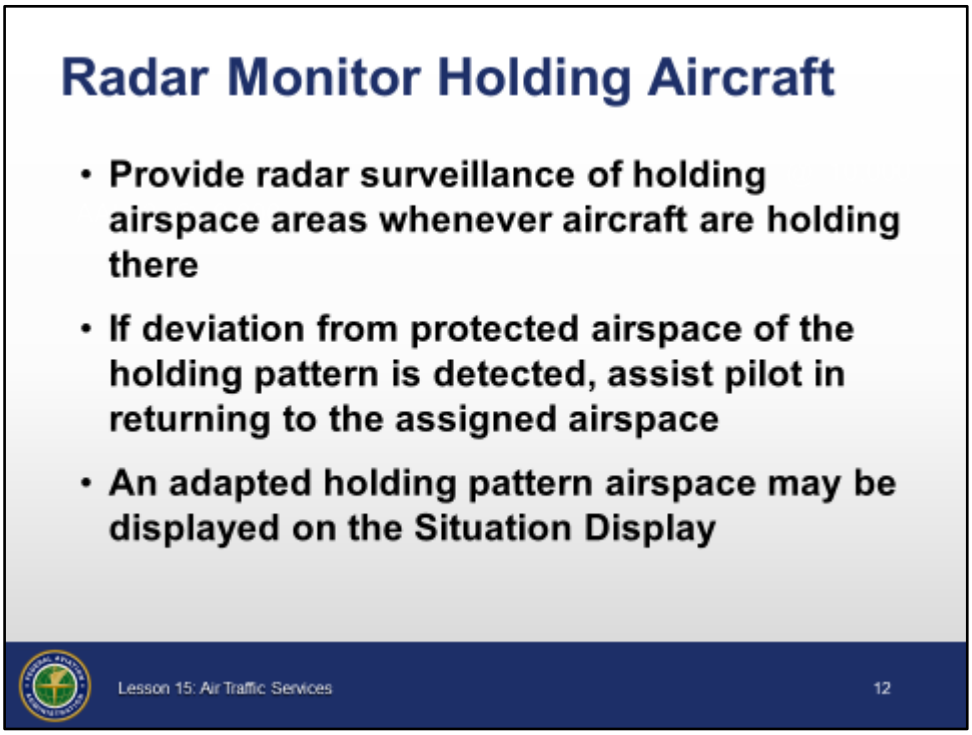
- In RVSM airspace between two aircraft that are vertically separated by 1,000':
  - If either aircraft is unable to maintain RVSM due to turbulence or mountain wave, vector either aircraft to avoid merging with the target of the other aircraft
- If the pilot requests, vector the aircraft to avoid merging with a target of previously issued traffic

NOTE: Aircraft closure rates are so rapid that merging target procedures must be issued in ample time for the pilot to decide if a vector is necessary.

- If unable to provide a vector, inform the pilot

Radar Monitor Holding Aircraft

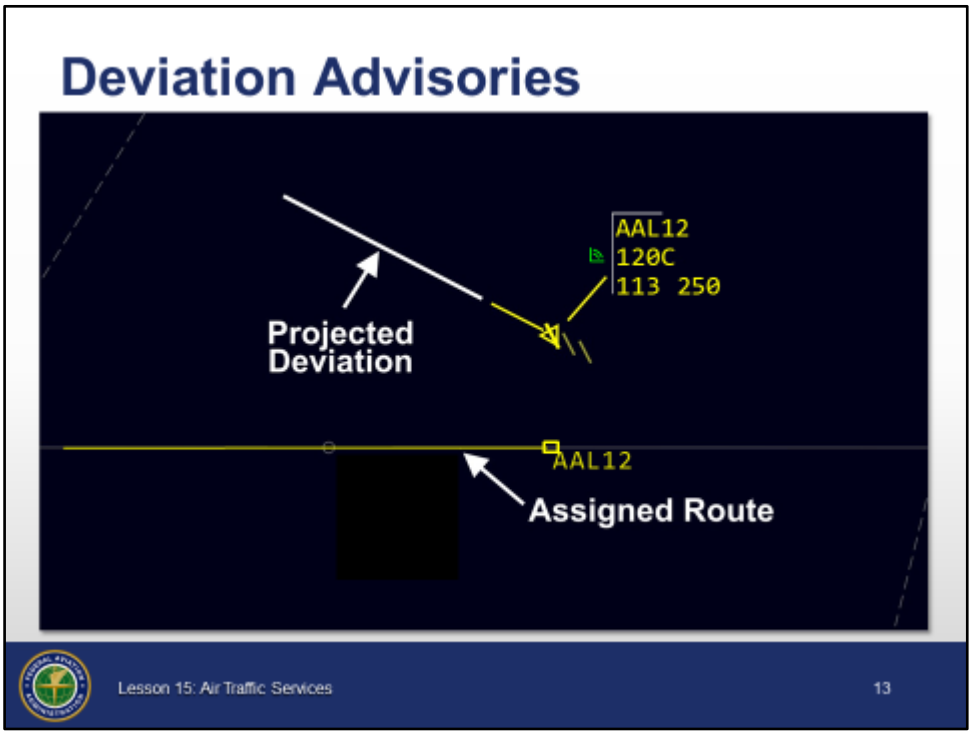
JO 7110.65, par. 5-1-5



- Provide radar surveillance of holding airspace areas whenever aircraft are holding there
- If deviation from protected airspace of the holding pattern is detected, assist pilot in returning to the assigned airspace
- Adapted holding pattern airspace may be displayed on the Situation Display

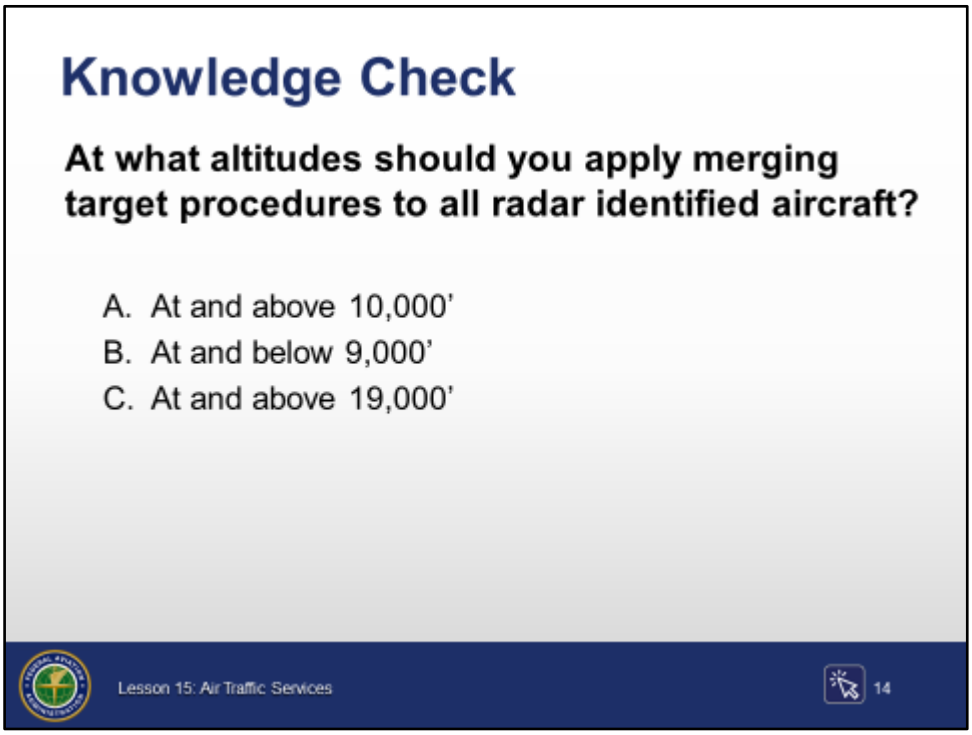
Deviation Advisories

JO 7110.65, par. 5-1-6



- Inform an aircraft when it is observed in a position and on a track which will obviously cause the aircraft to deviate from its protected airspace area
  - Help the aircraft to return to the assigned protected airspace, if necessary

Knowledge Check



Question: At what altitude should you apply merging target procedures to all radar identified aircraft?

Hazardous Inflight Weather Advisory

JO 7110.65, par. 2-6-6 and PCG

- Hazardous weather information includes:
  - Significant Meteorological Information (SIGMET/WS)
  - Convective SIGMET (WST)
  - Urgent Pilot Weather Report (urgent PIREP/UUA)
  - Center Weather Advisory (CWA)
  - Airmen's Meteorological Information (AIRMET/WA)
  - Any other weather, such as isolated thunderstorms that are rapidly developing and increasing in intensity, or
  - Low ceilings and visibilities that are becoming widespread, which is considered significant and are not included in a current hazardous weather advisory

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PROCEDURES AND PHRASEOLOGY *(CONT'D)*

Hazardous Inflight Weather Advisory (Con't)

JO 7110.65, par. 2-6-6 and PCG

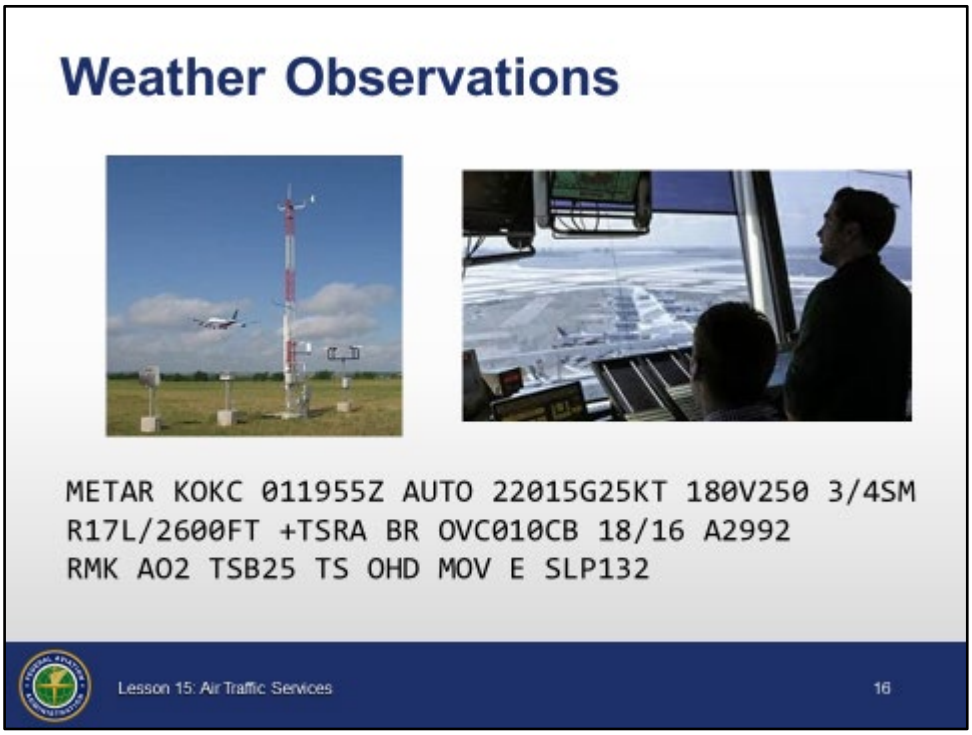
⊙ Upon receipt of hazardous weather information, a hazardous inflight weather advisory must be broadcast once on all frequencies, except emergency, when any part of the affected area is within 150 nautical miles of your airspace

- Broadcast is not required if aircraft on your frequency will not be affected
- Pilots requesting additional information must be directed to contact the nearest Flight Service

PROCEDURES AND PHRASEOLOGY *(CONT'D)*

Weather Observations

Advisory Circular: AC 00-45H, pars. 3.1.1, 3.1.5



- Two types of weather observations are recorded at terminal facilities which may require dissemination:
  - An Aviation Routine Weather Report, referred to as METAR, documents surface weather observation
    - Typically scheduled hourly
  - Special Weather Report, indicated by SPECI, is an unscheduled report taken when special criteria are observed between hourly reports

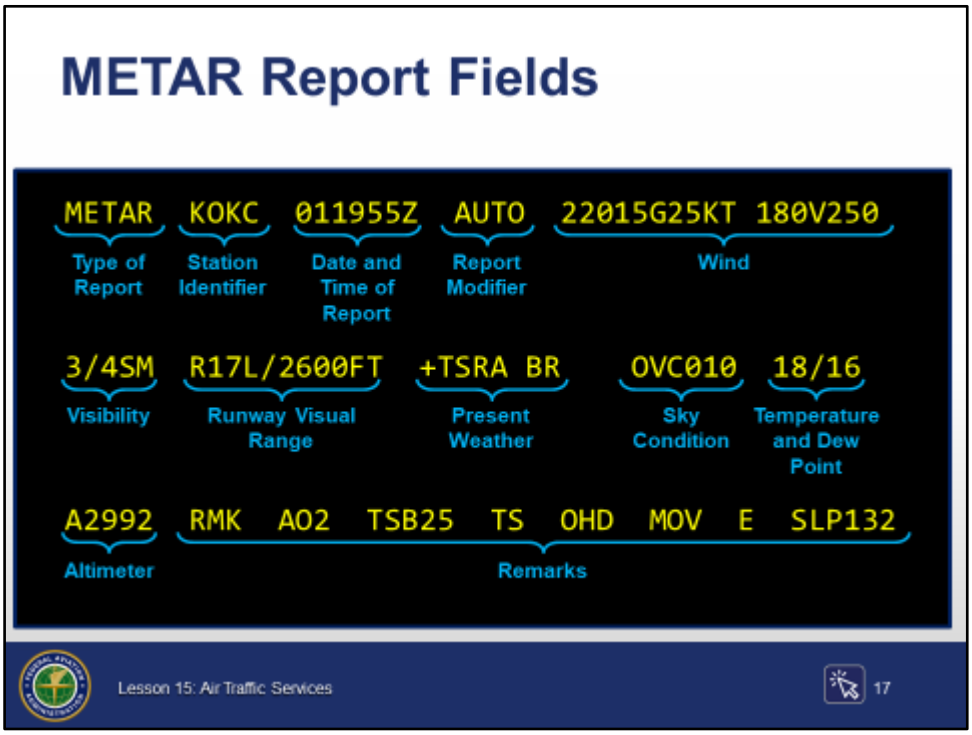
Examples: Visibility decreases to less than 1 mile; tornado; thunderstorm; aircraft mishap

    - Contains all the same data found in a METAR

- Used worldwide and follows International Civil Aviation (ICAO) guidelines
- Observations accomplished through:
  - Human observation (manual)
  - Instruments and algorithms (automated)
  - Combination of manual and automated

METAR Report Fields

Advisory Circular: AC 00-45H, pars. 3.1.1, 3.1.5



- Type of report
  - METAR or SPECI
- Station identifier
  - ICAO four letter airport code
- Date and time of report, appended with a "Z" to indicate Coordinated Universal Time (UTC)

  Format: ddhhmmZ
- Report modifier
  - AUTO - fully-automated, no human intervention or oversight
  - COR - corrected report

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METAR Report Fields (Cont'd)

Advisory Circular: AC 00-45H, pars. 3.1.1, 3.1.5

- ⊙ Wind group contains several elements, depending on conditions
  - Direction wind is coming from - first three digits
    - In degrees relative to true north
  - Speed - two or three digits following direction, ending in KT

Example: 05008KT

  - Gusts (if applicable) - "G" and two or three digits following speed

Example: 22015G35KT

  - Variable wind direction (if applicable)
    - Speed less than 6 knots - VRB in place of direction, then speed

      Example: VRB03KT

    - Speed greater than 6 knots and direction varies by 60 degrees or more - six digits separated by a "V" after the wind group

      Example: 21010KT 180V240

- ⊙ Visibility
  - Surface visibility in statute miles (SM)
- ⊙ Runway Visual Range (RVR) group
  - Horizontal distance of visibility down the runway
  - Reported when prevailing visibility is 1 SM or less and/or the RVR for designated instrument runway is 6,000' or less

NOTE: Prevailing visibility is the greatest horizontal visibility equaled or exceeded throughout at least half the horizon circle which need not necessarily be continuous.

  - RVR contains several elements
    - "R" followed by the runway number

      Example: R36L

    - After the runway number, a "/" followed by the visual range in feet
    - Ends in FT

      Example: R18R/0800FT

Continued on next page

METAR Report Fields (Cont'd)

Advisory Circular: AC 00-45H, pars. 3.1.1, 3.1.5

⊙ Present weather group

- Includes precipitation, obscurations, and other weather phenomena sub-groups
- Each sub-group is separated from the other by a space
- Precipitation sub-group can include up to three types of precipitation
- Can include intensity, proximity, and descripted qualifiers

Example: FC +TSRA BR

Other: FC (funnel clouds)

Precipitation: +TSRA (thunderstorm, heavy rain)

Obscuration: BR (mist)

⊙ Sky condition group

- Description of appearance of the sky, including either cloud cover, vertical visibility, or clear skies
- First three letters indicate amount of cloud cover, followed by the height of the base of the cloud cover in three digits (AGL)
- Multiple layers can be included in ascending order

NOTE: See Advisory Circular: AC 00-45H, Table 3-3 for the codes for reporting sky conditions.

Example: SCT033 BKN085

– Scattered layer at 3,300'

– Broken layer (ceiling) at 8,500'

⊙ Temperature/Dewpoint group

- Air temperature and dewpoint
- Two digits each, rounded to the whole degree Celsius
- Temperature and dewpoint are separated by a "/"
- Sub-zero temperatures and dewpoints are prefixed with an "M"

Example: 04/M02 (temperature 4˚C with dewpoint -2˚C)

METAR Report Fields (Cont'd)

Advisory Circular: AC 00-45H, pars. 3.1.1, 3.1.5

- Altimeter
  - Current pressure (altimeter setting) at elevation

    Format: Adddd

    Example: A2992
- Remarks
  - Only included when appropriate
  - RMK followed by remark in plain text
  - May include thunderstorm location, lightning, volcanic eruptions, funnel clouds, etc.

Soliciting PIREPs

JO 7110.65, par. 2-6-2

- Solicit Pilot Reports (PIREPs) of weather when requested, deemed necessary, or when one of the following conditions exist or is forecast for your airspace:
  - Ceilings at or below 5,000' (include cloud bases and/or tops reports)
  - Visibility (surface and aloft) at or less than 5 miles
  - Thunderstorms and related phenomena
  - Turbulence (moderate or greater)
  - Icing (light or greater)
  - Wind shear
  - Braking action reports
  - Volcanic ash clouds
  - Detection of sulfur gases in the cabin, associated with volcanic activity

NOTE: When providing approach control services, obtain at least one descent or climbout PIREP each hour to include cloud bases, tops, and other related phenomena.

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Soliciting PIREPs (Cont'd)

JO 7110.65, par. 2-6-2

⊙ Record the following with PIREPs:

- Time
- Aircraft position
- Aircraft type
- Altitude
- When the PIREP involves icing include:
  - Icing type and intensity
  - Air temperature in which icing is occurring

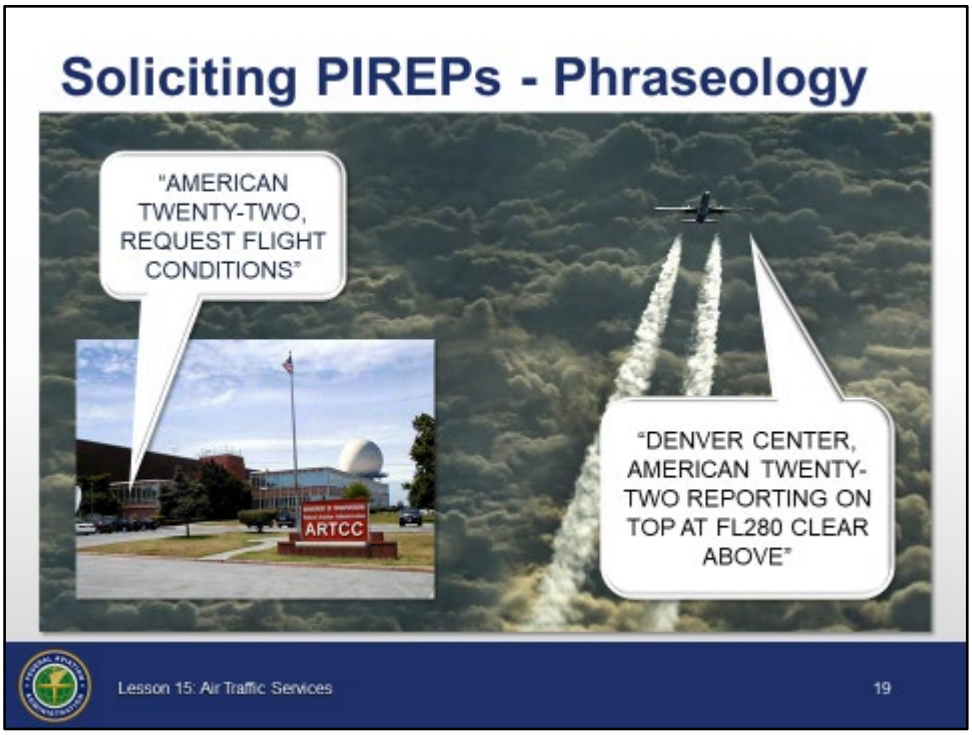
⊙ Additional PIREP information includes, but not limited to:

- Strong frontal activity
- Squall lines
- Mountain wave
- Other conditions pertinent to flight safety

NOTE: Routine PIREPs indicating a lack of forecasted weather conditions, for example, a lack of icing or turbulence, are also valuable to aviation weather forecasters and pilots. This is especially true when adverse conditions are expected or forecasted but do not develop or no longer exist.

Soliciting PIREPs - Phraseology

JO 7110.65, par. 2-6-2



⊙ Obtain PIREPs directly from the pilot

- If the PIREP is requested by another facility, you may instruct the pilot to deliver it directly to that facility

REQUEST/SAY FLIGHT CONDITIONS

or if appropriate,

REQUEST/SAY <specific conditions, i.e., ride, cloud, visibility, etc.> CONDITIONS

And if necessary,

OVER <fix>

or

ALONG PRESENT ROUTE

or

BETWEEN <fix> and <fix>

Example: "AMERICAN TWENTY-TWO, REQUEST FLIGHT CONDITIONS"

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Soliciting PIREPs - Phraseology (Cont'd)

JO 7110.65, par. 2-6-2

JO 7210.3, par. 6-3-1

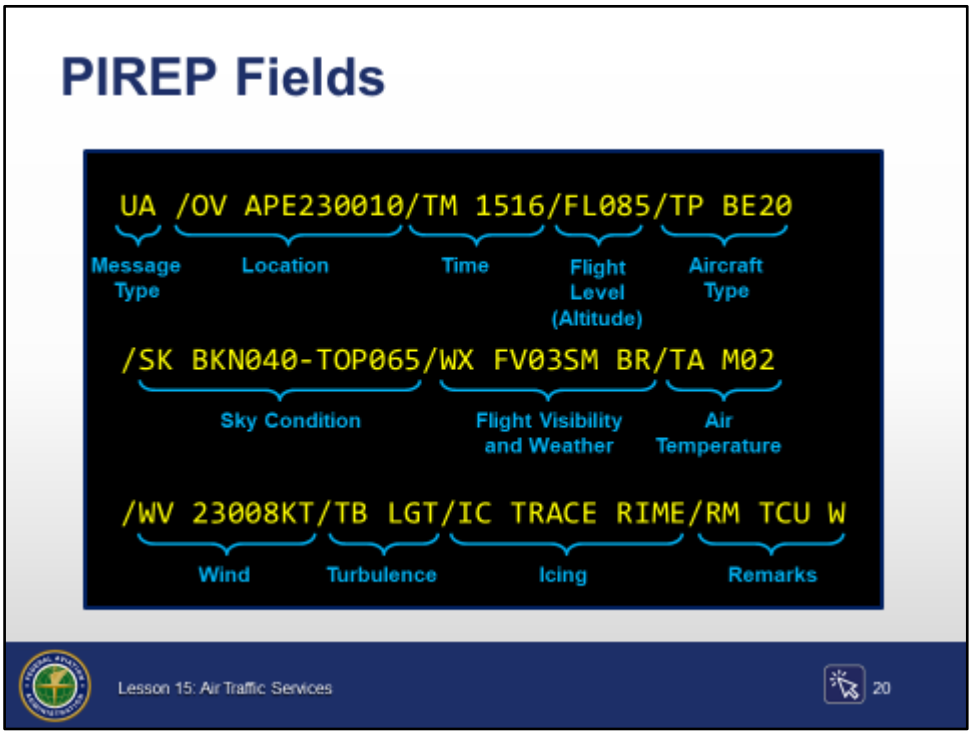
⊙ Relay all PIREPs in a timely manner to:

- All concerned aircraft
- Facility weather coordinator

PIREP Fields

Advisory Circular: AC 00-45H, par. 3.2

JO 7210.3, par. 6-10-2



- PIREPs can be recorded and disseminated through the En Route Information Display System (ERIDS)
- Report fields
  - Message type
    - Urgent (UUA) contain information about:
      - Tornadoes, funnel clouds, or waterspouts
      - Severe or extreme turbulence
      - Severe icing
      - Hail
      - Low-level wind shear (LLWS) within 2,000' of surface
      - Volcanic ash clouds
      - Any other hazardous weather phenomena
    - Routine (UA)
      - Issued after receiving a report from a pilot that does not contain any urgent information

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PIREP Fields (Cont'd)

Advisory Circular: AC 00-45H, par. 3.2

- Location
  - /OV followed by the position reference where the phenomenon occurred (not location of aircraft when report is submitted)
  - Referenced by either geographical position or route segment
    - VHF NAVAID or airport
    - VHF NAVAID or airport followed by three digits to define a radial and three digits to define the distance in nautical miles

      Examples: `/OV APE` - over Appleton VOR

      `/OV KJFK` - over JFK airport

      `/APE230010` - 230 degrees at 10 miles from Appleton VOR
    - Use two or more fixes to describe a route segment

      Example: `/OV KSTL-KMKC` - from St. Louis airport to Kansas City airport
- Time
  - /TM followed by the UTC time that the reported phenomenon occurred or was encountered

    Example: `/TM 1315`
- Flight Level (Altitude)
  - /FL followed by the altitude in hundreds of feet MSL where the phenomenon was first encountered

    Examples: `/FL085` - 8,500' MSL

    `/FL310` - FL310
- Aircraft type
  - /TP followed by:
    - Aircraft type, if known
    - UNKN, if not known
- Sky condition
  - /SK followed by:
    - An abbreviation indicating cloud cover, then
    - 3 digits indicating the height of cloud bases in hundreds of feet MSL, then

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PIREP Fields (Cont'd)

Advisory Circular: AC 00-45H, par. 3.2

- TOP followed by 3 digits indicating the height top layer of clouds in hundreds of feet MSL, then
- SKC, if skies are clear above the highest cloud level
- UNKN if height of cloud base is not known

Examples: `/SK BKN040-TOP065`

`/SK OVC100-TOP0110/ SKC`

`/SK SCT050-TOPUNKN`

- Flight visibility and weather
  - /WX followed by:
    - If flight visibility is included in the report, then FV followed by 2-digit visibility in whole statue miles, appended with SM
    - Flight weather types, using one or more of the same weather reporting codes for METAR contained in Advisory Circular: AC 00-45H, Table 3-2

    Example: `/WX FV03SM +TSRAGR` - flight visibility 3 SM, thunderstorm, heavy rain, hail
- Air temperature
  - /TA followed by the outside air temperature in 2 digits in degrees Celsius
  - Sub-zero temperatures are prefixed with an "M"

    Examples: `/TA 08`

    `/TA M07`
- Wind direction and speed
  - /WV followed by 3 digits for direction then 2 or 3 digits to indicate speed, appended with KT

Continued on next page

PIREP Fields (Cont'd)

Advisory Circular: AC 00-45H, par. 3.2

- Turbulence
  - /TB followed by turbulence duration, if reported, then
  - Intensity, type, and altitude (if differs from value in altitude/FL group)

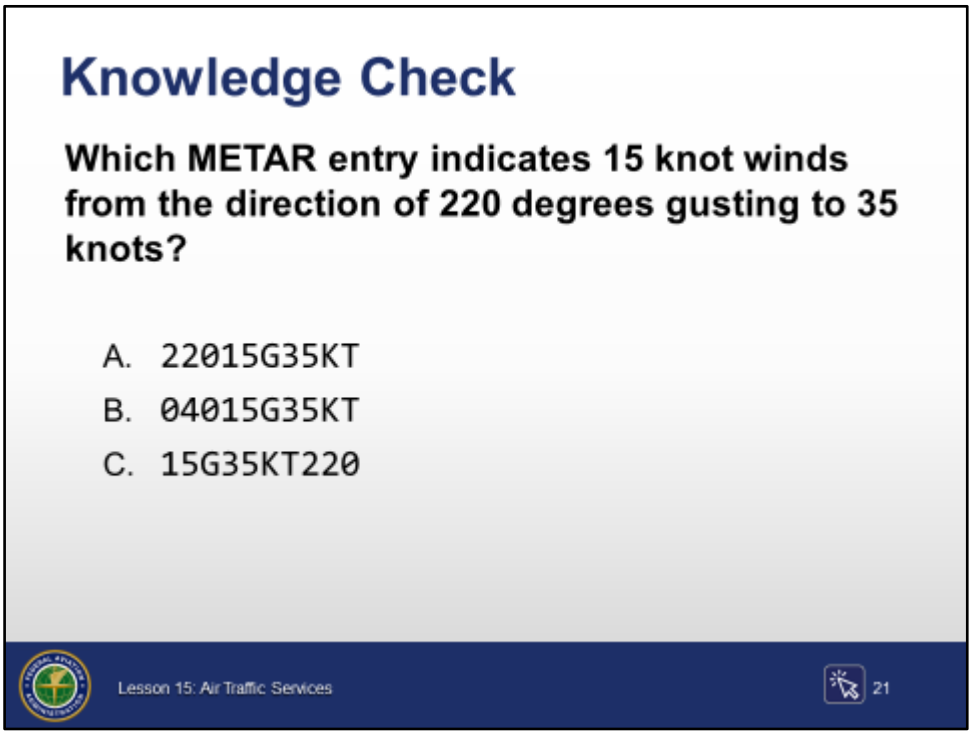
    Examples: `/TB LGT` - Light turbulence

    `/TB OCNL MOD-SEV BLO 080` - Occasional moderate to severe turbulence below 8,000'
- Icing
  - /IC followed by intensity, type, and altitude (if differs from value in altitude/FL group)

    Example: `/IC LGT-MOD MX 085` - Light to moderate mixed icing, 8,500'
- Remarks
  - Includes phenomena considered important that doesn't fit in any other group, such as tornadoes, thunderstorm movement, and lightning
  - /RM followed by intensity, type, and altitude (if differs from value in altitude/FL group)

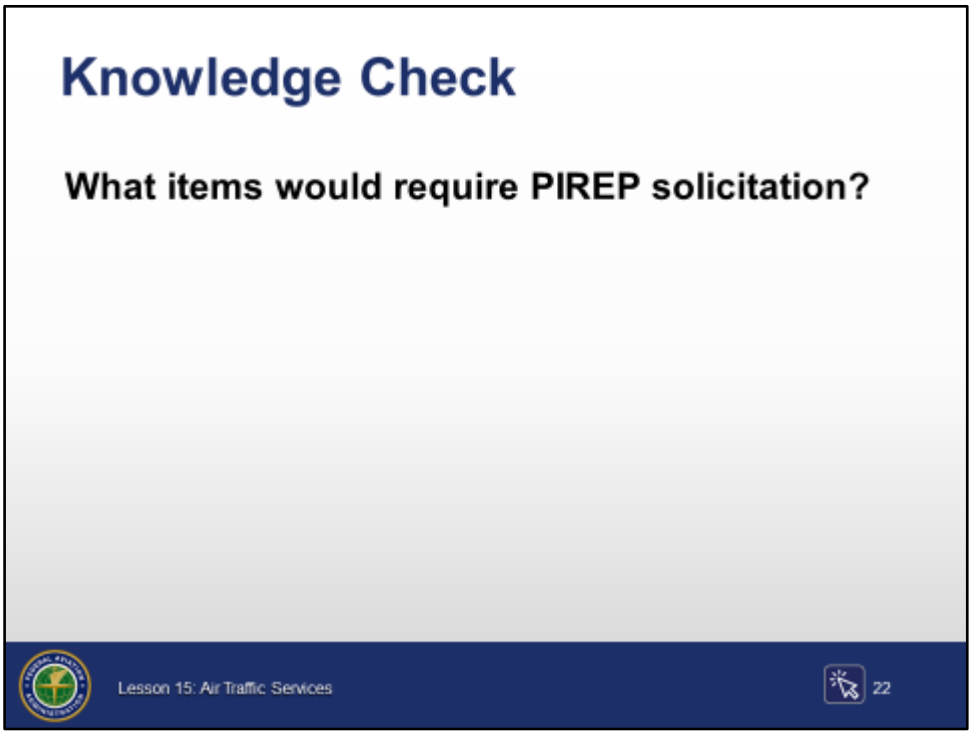
    Example: `/RM TORNADO W MOV E` - Tornado located to the West of the aircraft position, moving East

Knowledge Check



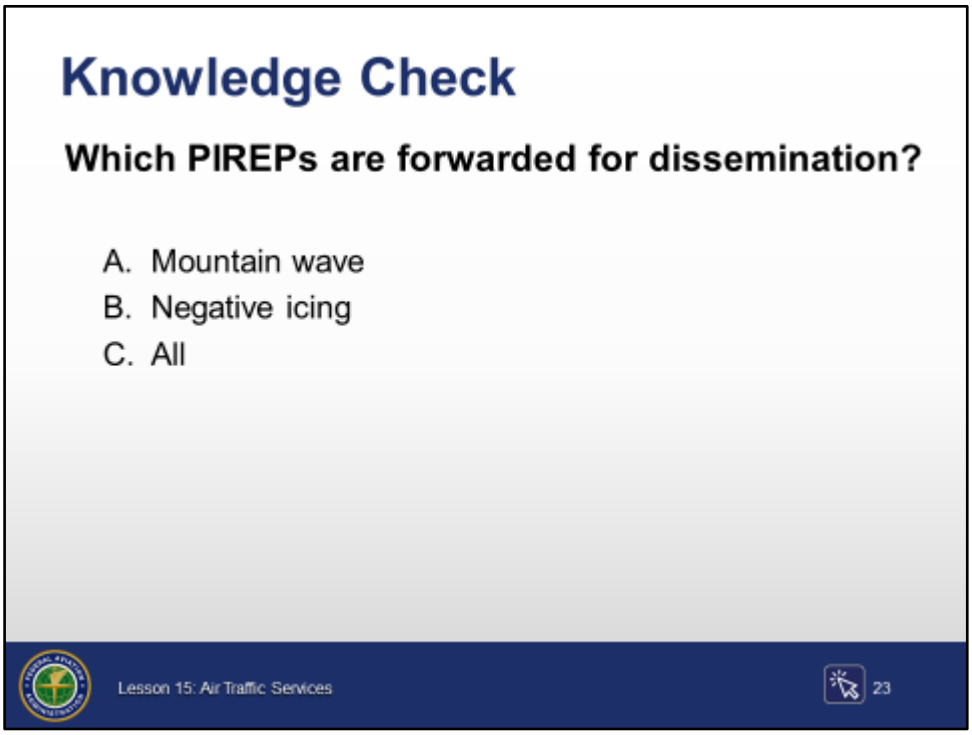
Question: Which METAR entry indicates 15 knot winds from the direction of 220 degrees gusting to 35 knots?

Knowledge Check



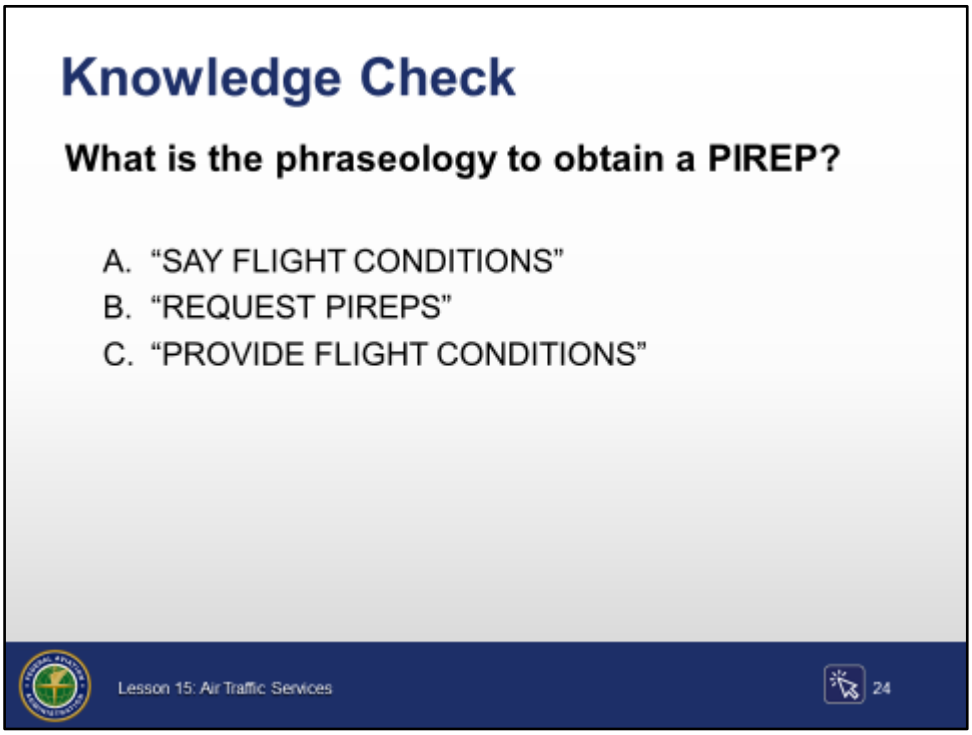
Question: What items would require PIREP solicitation?

Knowledge Check



Question: Which PIREPs are forwarded for dissemination?

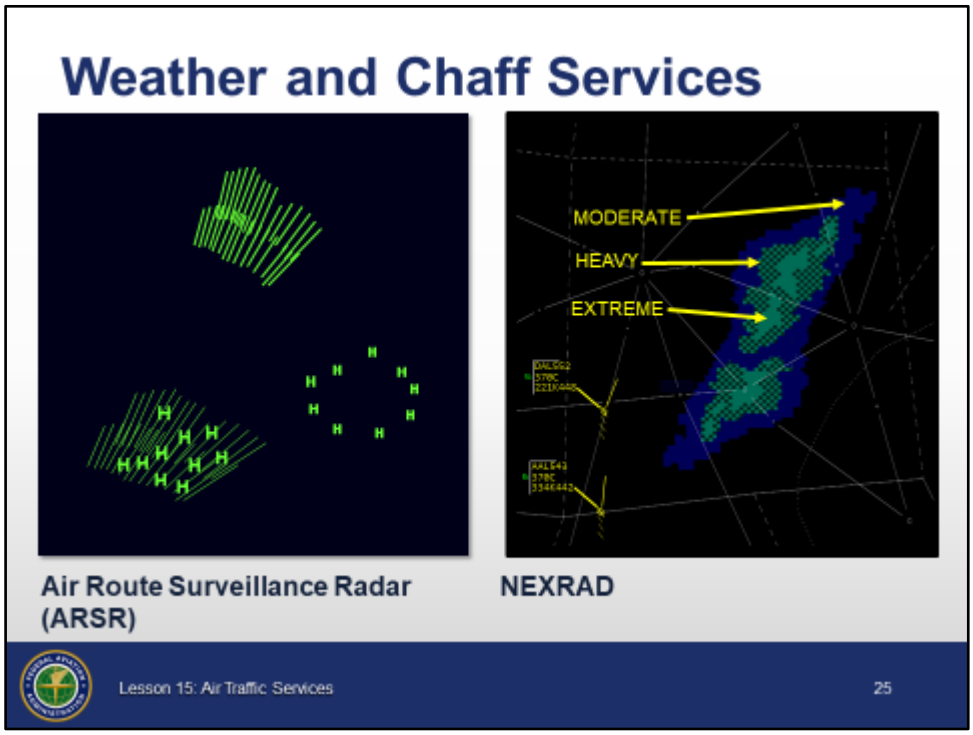
Knowledge Check



Question: What is the phraseology to obtain a PIREP?

Weather and Chaff Services

JO 7110.65, par. 2-6-4, PCG



- Issue pertinent information on observed and reported areas of weather and chaff to potentially affected aircraft

CHAFF - Thin, narrow metallic reflectors dropped from aircraft to reflect radar energy and create large targets on the Situation Display.

- Define the area of coverage:
  - In terms of azimuth (by referring to the 12-hour clock) and distance from the aircraft, and/or
  - General width of the area and the area of coverage in terms of fixes or distance and direction from fixes

Continued on next page

Weather and Chaff Services (Cont'd)

JO 7110.65, par. 2-6-4

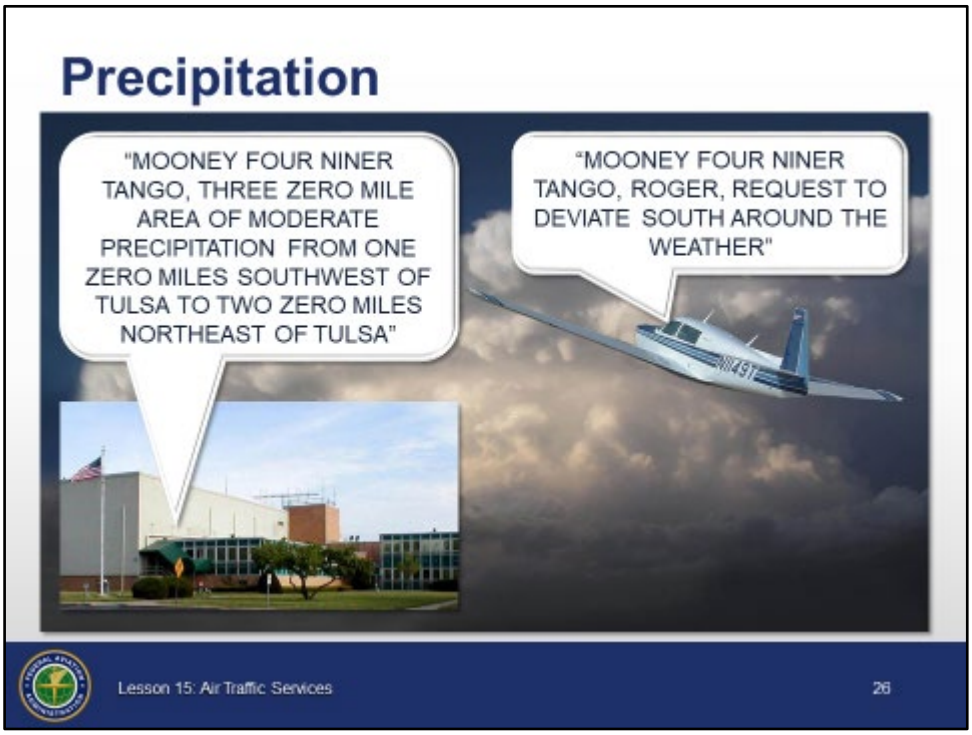
⊙ Conditions affecting air safety such as:

- Funnel cloud activity
- Lines of thunderstorms
- Embedded thunderstorms
- Large hail
- Wind shear
- Microbursts
- Moderate to extreme turbulence
- Light to severe icing

⊙ Inform towers for which you provide any kind of approach control service of observed precipitation on the Situation Display that might affect their operations

Precipitation

JO 7110.65, par. 2-6-4

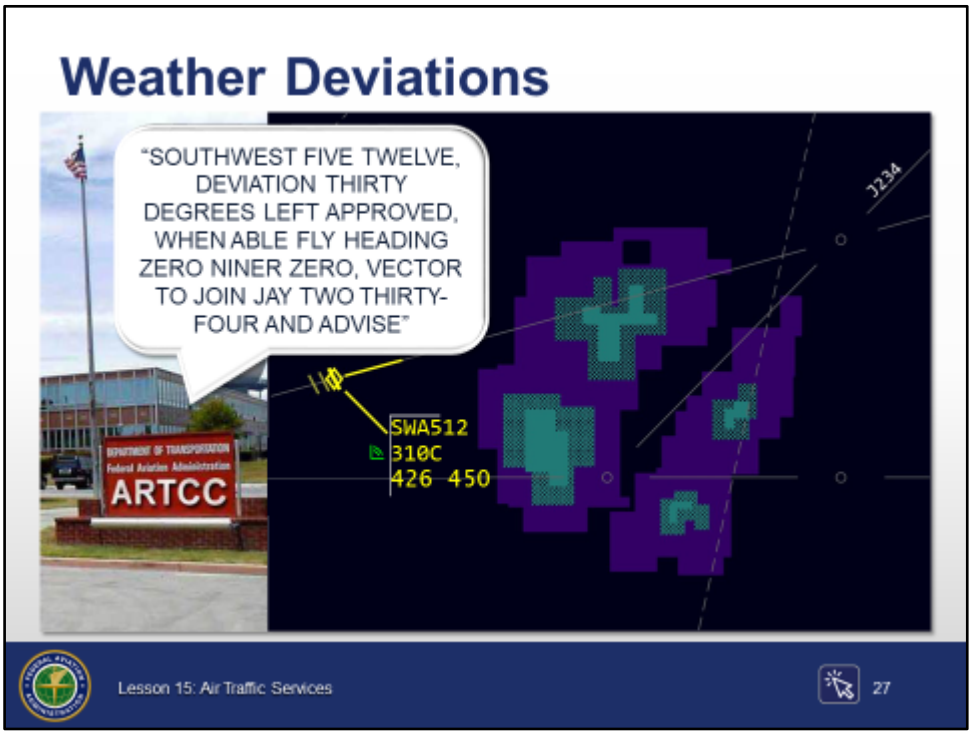


- ⊙ Use the term precipitation when describing radar-derived weather
  - Issue the precipitation intensity from the lowest descriptor to the highest descriptor when that information is available
    - Moderate
    - Heavy
    - Extreme

    NOTE: Weather and Radar Processor (WARP) does not display light intensity.
  - Do not use the word turbulence in describing radar-derived weather
  - If NEXRAD is down, use Air Route Surveillance Radar (ARSR)
    - Precipitation intensity descriptors for ARSR:
      - Moderate - to describe lowest displayable intensity
      - Heavy to extreme - to describe highest displayable intensity
- ⊙ Ensure the highest level of precipitation intensity within your airspace is displayed, unless operational or equipment limitations exist

Weather Deviations

JO 7110.65, par. 2-6-4



- Approve deviations and/or provide radar navigational guidance to avoid areas of weather or chaff when requested by the pilot
- In areas of significant weather:
  - Plan ahead
  - Upon pilot request, suggest alternative routes or altitudes
- An approval for lateral deviation authorizes the pilot to maneuver left or right within the limits of the lateral deviation area
- If a pilot enters your airspace already deviating for weather, advise the pilot of any additional pertinent weather which may affect the route
- If traffic and airspace (i.e., special use airspace boundaries, LOA constraints) permit, combine the approval for weather deviation with a clearance on course

Continued on next page

Weather Deviations (Cont'd)

JO 7110.65, par. 2-6-4

DEVIATION <restrictions, if necessary> APPROVED, WHEN ABLE PROCEED DIRECT <name of NAVAID/WAYPOINT/FIX>"

or

DEVIATION <restrictions, if necessary> APPROVED, WHEN ABLE FLY HEADING <degrees>, VECTOR TO JOIN <airway> AND ADVISE

Examples: "DEVIATION TWENTY DEGREES RIGHT APPROVED, WHEN ABLE PROCEED DIRECT O'NEILL VORTAC AND ADVISE"

"DEVIATION THIRTY DEGREES LEFT APPROVED, WHEN ABLE FLY HEADING ZERO NINER ZERO, VECTOR TO JOIN JAY TWO THIRTY-FOUR AND ADVISE"

⊙ When traffic or airspace prevent you from clearing the aircraft on course at the time of the approval for a weather deviation, instruct the pilot to advise when clear of weather

DEVIATION <restrictions if necessary> APPROVED, ADVISE CLEAR OF WEATHER

Example: "DEVIATION NORTH OF COURSE APPROVED, ADVISE CLEAR OF WEATHER"

⊙ When a deviation cannot be approved as requested because of traffic, take an alternate course of action that:

- Provides positive control for traffic resolution, and
- Satisfies the pilot's need to avoid weather

"UNABLE REQUESTED DEVIATION, FLY HEADING (heading), ADVISE CLEAR OF WEATHER"

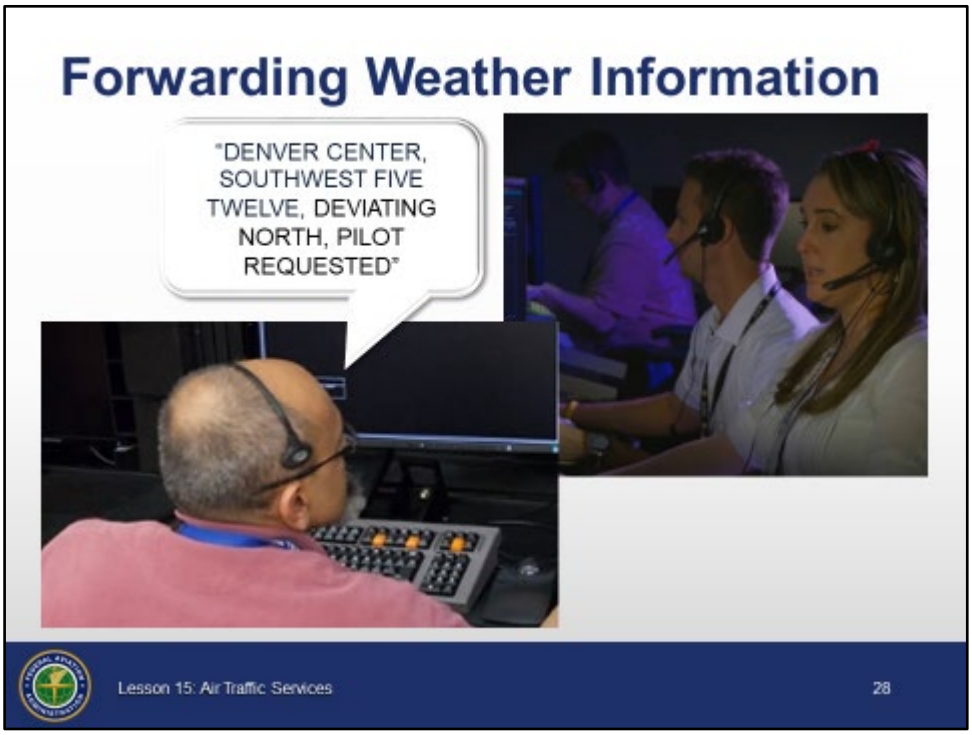
or

UNABLE REQUESTED DEVIATION, TURN <number of degrees> DEGREES <left or right> FOR TRAFFIC, ADVISE CLEAR OF WEATHER

Example: "UNABLE REQUESTED DEVIATION, TURN THIRTY DEGREES RIGHT VECTOR FOR TRAFFIC, ADVISE CLEAR OF WEATHER"

Forwarding Weather Deviation Information

JO 7110.65, par. 2-6-4



- When forwarding weather deviation information, the transferring controller must clearly coordinate the nature of the route guidance service being provided. This coordination should include, but is not limited to:
  - Assigned headings
  - Suggested headings
  - Pilot-initiated deviations
- Coordination can be accomplished by either:
  - Verbal
  - Automated, or
  - Pre-arranged procedures

Continued on next page

Forwarding Weather Deviation Information (Cont'd)

JO 7110.65, par. 2-6-4

⊙ Emphasis should be made between:

- Controller assigned headings
- Suggested headings
- Pilot initiated deviations

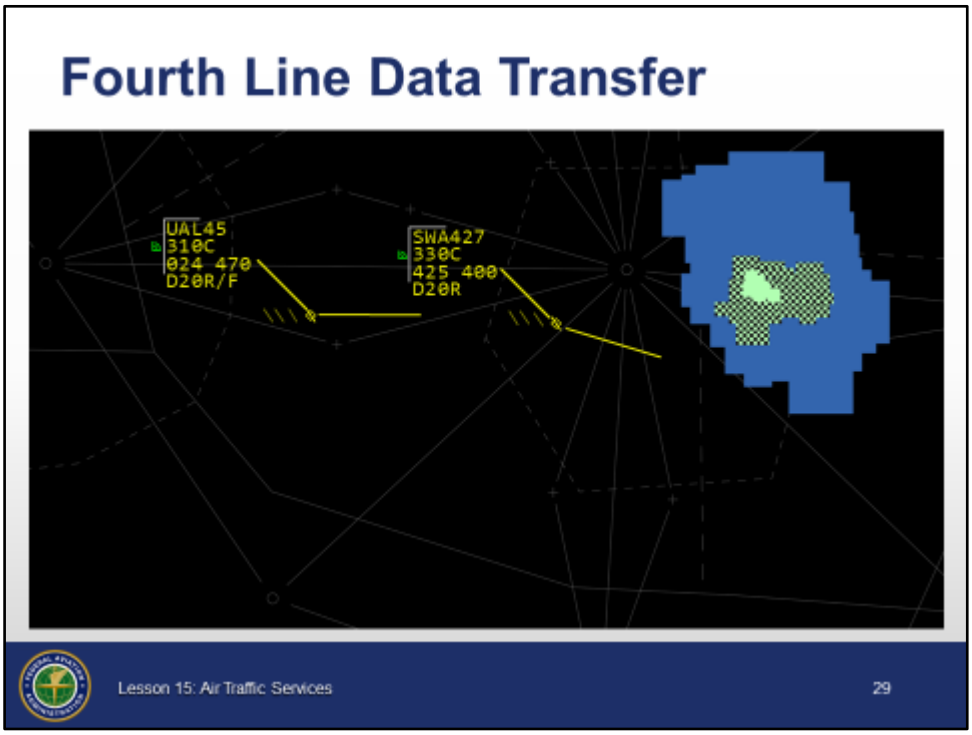
<call sign> ASSIGNED HEADING <number> FOR WEATHER AVOIDANCE

or

<call sign> DEVIATING <direction>, PILOT REQUESTED

Fourth Line Data Transfer

JO 7110.65, par. 2-6-4



- The inclusion of a NAVAID, waypoint, or /F in the fourth line data indicates that the pilot has been authorized to deviate for weather and must rejoin the route at the named NAVAID or waypoint, or if /F is used, at the next fix

  Example: "DEVIATION TWENTY DEGREES RIGHT APPROVED, WHEN ABLE PROCEED DIRECT O'NEILL VORTAC AND ADVISE"

  - In this case, the corresponding fourth line entry is `D20R/ONL` or `D20R/F`

- The absence of a NAVAID, waypoint, or /F in the fourth line indicates:
  - Pilot has been authorized to deviate for weather only, and receiving controller must provide a clearance to rejoin the route

  Example: "DEVIATION TWENTY DEGREES RIGHT APPROVED, ADVISE CLEAR OF WEATHER"

  - If the free text character limitation prevents the use of fourth line coordination, verbal coordination is required

  Example: "DEVIATION THIRTY DEGREES LEFT APPROVED, WHEN ABLE FLY HEADING ZERO NINER ZERO, VECTOR TO JOIN JAY TWO THIRTY-FOUR AND ADVISE"

Bird Activity Information

JO 7110.65, par. 2-1-23

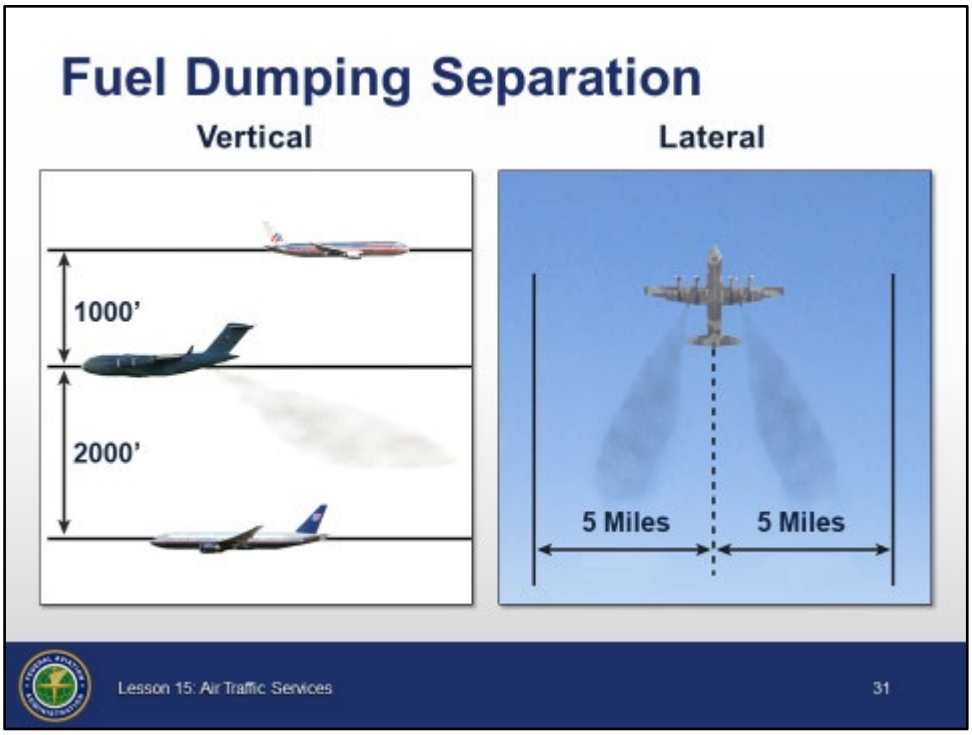
- Issue advisory information that is either pilot-reported, tower-observed, or radar-observed and pilot-verified bird activity
- Include:
  - Position
  - Species or size, if known
  - Course of flight, if known
  - Altitude, if known
- Continue advisories for at least 15 minutes, or until subsequent reports indicate activity is no longer a factor
- Relay information to adjacent facilities if activity might affect them

Examples: "FLOCK OF GEESE, ONE O'CLOCK, SEVEN MILES, NORTHBOUND, LAST REPORTED AT FOUR THOUSAND"

"FLOCK OF SMALL BIRDS, SOUTHBOUND ALONG MOHAWK RIVER, LAST REPORTED AT THREE THOUSAND"

Fuel Dumping

JO 7110.65, pars. 9-4-1 through 9-4-5



- When an aircraft plans to dump fuel, determine:
  - Route
  - Altitude
  - Weather conditions
- Separation
  - If not dumping fuel for emergency reasons, the aircraft in VFR or IFR conditions may be requested to fly a different route
  - If the aircraft is in IFR conditions, assign an altitude at least 2,000' above the highest obstacle within 5 miles of the route or pattern being flown
  - Separate IFR aircraft from aircraft dumping fuel as follows:
    - 1,000' above, or approved vertical separation at or above FL290 with other aircraft at or above FL290, whichever is greater
    - 2,000' below
    - 5 miles radar
    - 5 miles laterally
  - Separate VFR radar-identified aircraft from aircraft dumping fuel by 5 miles and in accordance with vectoring applications for VFR

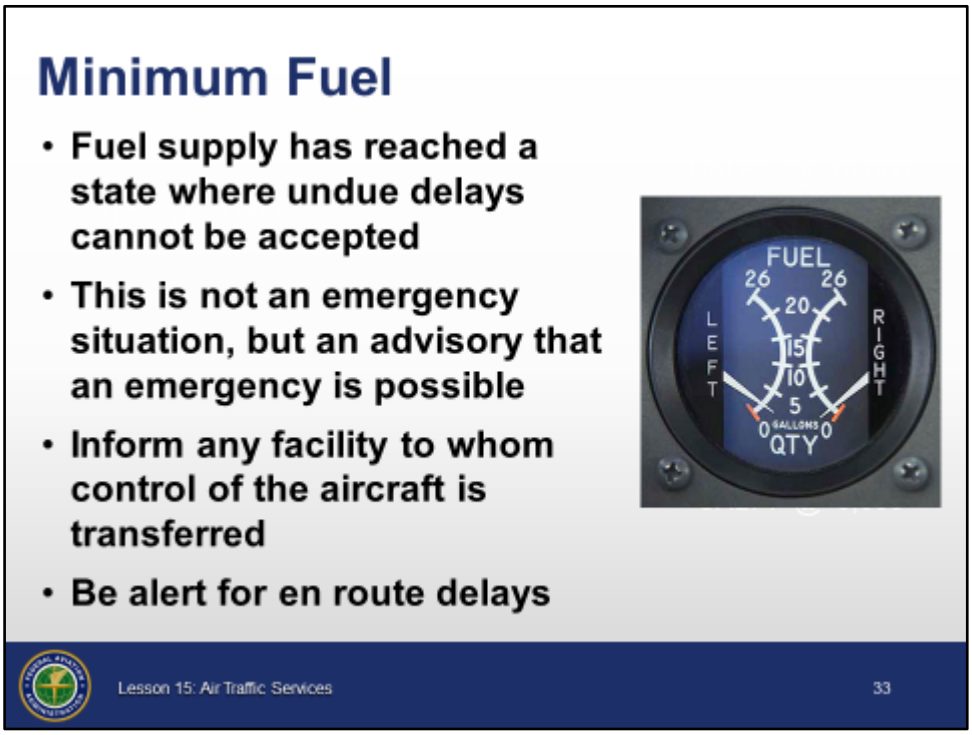
Fuel Dumping Advisories

JO 7110.65, pars. 9-4-1 through 9-4-5

- Information dissemination
  - Inform concerned controllers and facilities
  - Broadcast an advisory every 3 minutes until dumping stops
  - Broadcast a termination advisory upon completion of dumping

Minimum Fuel

JO 7110.65, par. 2-1-8



⊙ If a pilot declares minimum fuel:

- The pilot recognizes that fuel supply has reached a state where undue delays cannot be accepted
- This is not an emergency situation, but an advisory that an emergency is possible
- Inform any facility to whom control of the aircraft is transferred
- Be alert for en route delays

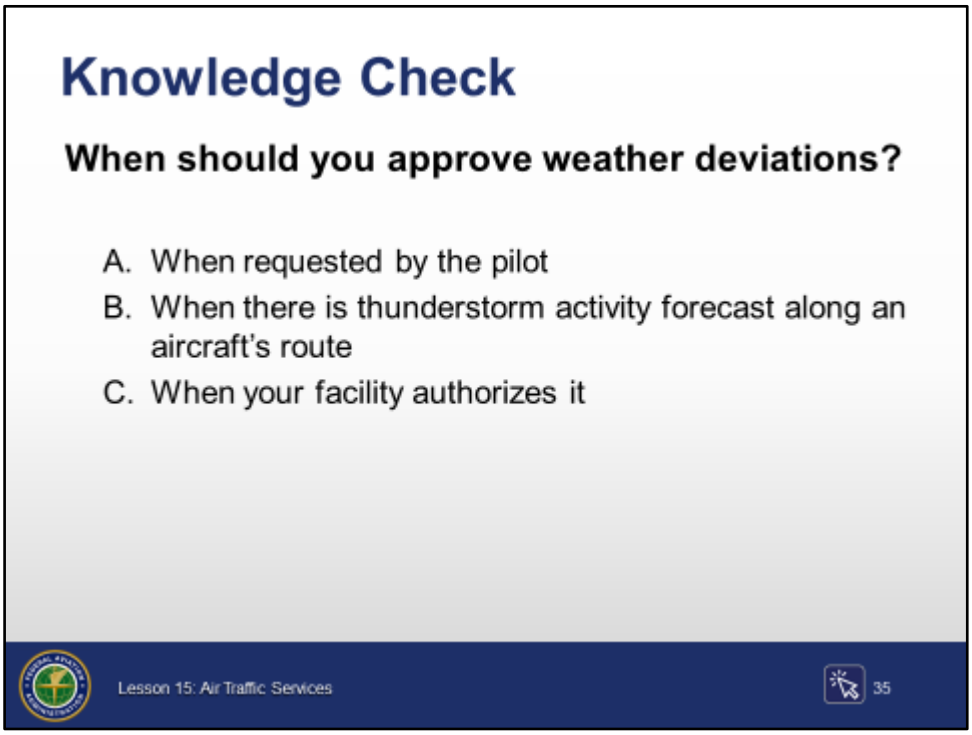
NOTE: In minimum fuel situations, it is good operating technique to allow the aircraft to remain at higher altitudes as long as possible in order to conserve fuel.

Inflight Equipment Malfunction

JO 7110.65, par. 2-1-7

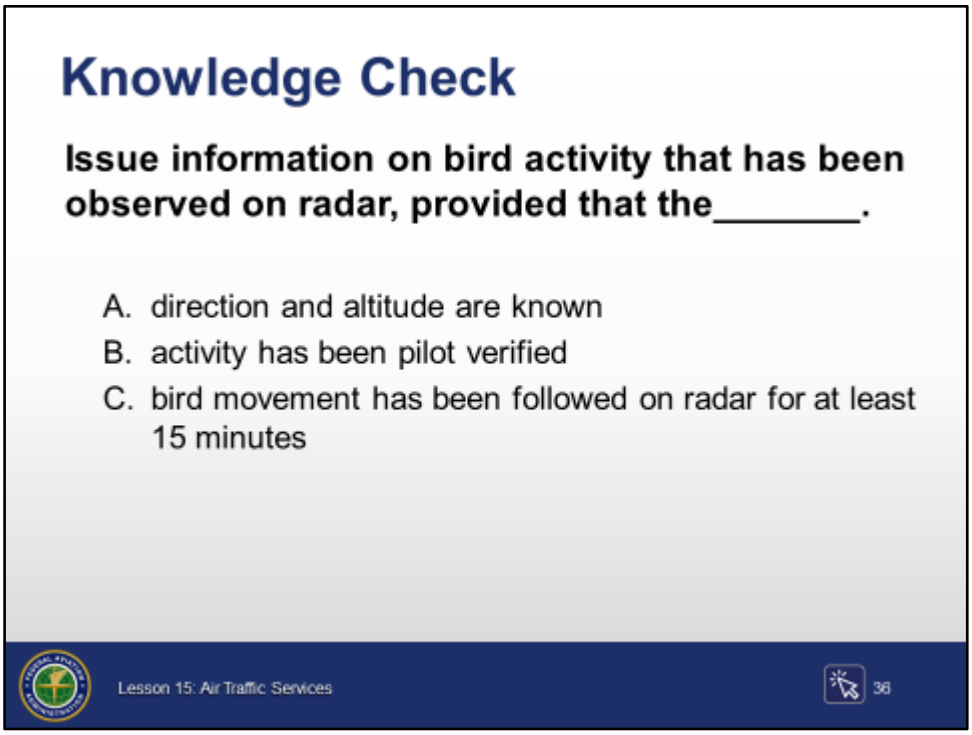
- Determine the nature and extent of any special handling desired by the pilot
- Provide the maximum assistance possible
- Relay details to subsequent controllers or facilities as necessary

Knowledge Check



Question: When should you approve weather deviations?

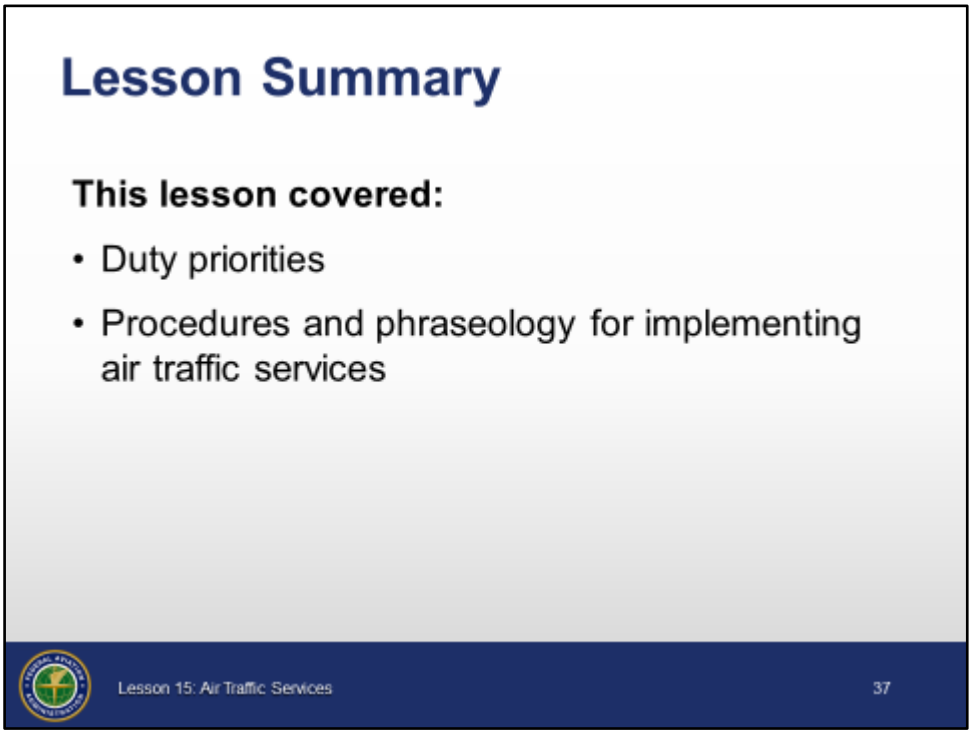
Knowledge Check



Question: Issue information on bird activity that has been observed on radar, provided that the_____.

CONCLUSION

Lesson Summary



This lesson covered:

- Duty priorities
  - First priority to separating aircraft and issuing safety alerts
  - Additional services provided by ATC
- Procedures and Phraseology
  - Traffic advisories
  - Not radar identified
  - Issuing vectors
  - Traffic no longer in sight
  - Merging target procedures and application
  - Radar monitor holding aircraft
  - Deviation advisories
  - Hazardous Inflight Weather Advisory
  - Weather Observations

Continued on next page

CONCLUSION *(CONT'D)*

Lesson Summary (Cont'd)

- METAR Report Fields
- Pilot Reports (PIREPs)
- Soliciting PIREPs
- Soliciting PIREPs phraseology
- PIREP Fields
- Weather and chaff services
- Precipitation
- Weather deviations
- Forwarding weather deviation information
- Fourth line data transfer
- Bird activity
- Fuel dumping
- Fuel dumping advisories
- Minimum fuel
- Inflight equipment malfunctions