SESSION 14: CROSS-COUNTRY PLANNING — IFR FUEL REQUIREMENTS AND RESERVE RULES

1. Under §91.167, when no alternate is required, an aircraft must carry enough fuel to fly to the destination and then for how long at normal cruise?

A. 30 minutes

B. 45 minutes

C. 60 minutes

D. 15 minutes

2. When an alternate IS required, the §91.167 fuel requirement is to fly to the destination, then to the alternate, plus:

A. 30 minutes at maximum range

B. 30 minutes at approach speed

C. 1 hour at normal cruise

D. 45 minutes at normal cruise

3. The §91.167 fuel reserve is computed at which speed/power setting?

A. Normal cruising speed

B. Maximum continuous power

C. Best-glide speed

D. Approach configuration airspeed

4. A flight requires 40 gallons to reach the destination, 18 gallons to reach the alternate, and burns 12 gallons per hour. The minimum legal fuel (alternate required) is:

A. 58 gallons

B. 67 gallons

C. 52 gallons

D. 49 gallons

5. For a flight with no alternate required that burns 10 gallons per hour and needs 30 gallons to the destination, the minimum legal fuel is:

A. 32.5 gallons

B. 35 gallons

C. 40 gallons

D. 37.5 gallons

6. The 45-minute reserve when no alternate is required is intended primarily to:

A. Provide a margin for delays, holding, or unforeseen conditions at the destination

B. Allow a full second approach attempt at the alternate

C. Satisfy the weight and balance computation

D. Account for fuel gauge inaccuracy only

7. A pilot computes a flight with an alternate required: 35 gallons to the destination, 15 gallons destination-to-alternate, and a 12 gph burn for the 45-minute reserve. The minimum legal fuel is:

A. 50 gallons

B. 56 gallons

C. 53 gallons

D. 59 gallons

8. The §91.167 fuel requirement is a:

A. Recommended target with no regulatory force

B. Goal that applies only to commercial operations

C. Legal minimum, below which the flight may not legally depart IFR

D. Value used only for weight and balance, not dispatch

9. Beyond the legal minimum, a prudent instrument pilot typically:

A. Carries exactly the legal minimum to save weight

B. Adds a personal reserve above the regulatory minimum for additional margin

C. Reduces fuel to improve climb performance

D. Relies on the destination always being available

10. A pilot's fuel burn calculation depends on forecast winds aloft because:

A. Winds aloft determine the required alternate minimums

B. Winds aloft set the legal reserve duration

C. Headwinds increase time enroute and therefore fuel required

D. Winds aloft have no effect on fuel planning

11. When determining whether the legal fuel requirement is met, the pilot compares the computed requirement against:

A. The actual usable fuel on board

B. The total fuel tank capacity including unusable fuel

C. The fuel burned on the previous flight

D. The manufacturer's advertised range

12. A flight plans 50 gallons to the destination with no alternate required, burning 15 gph. The reserve fuel quantity alone is:

A. 7.5 gallons

B. 15 gallons

C. 5 gallons

D. 11.25 gallons

13. Unusable fuel must be excluded from the §91.167 computation because:

A. It is counted twice in the tank capacity

B. It cannot be drawn upon by the engine in normal flight

C. It is reserved exclusively for the alternate leg

D. It evaporates during cruise

14. A pilot facing a strong forecast headwind on the return leg should:

A. Ignore the headwind since reserves cover it

B. Reduce the planned reserve to compensate for the longer flight

C. Plan for the legal minimum based on no-wind times

D. Recompute enroute fuel using the headwind-adjusted groundspeed and time

15. The fundamental §91.167 sequence when an alternate is required is:

A. Fuel to destination + fuel to alternate + 45-minute reserve

B. Fuel to destination + 45-minute reserve only

C. Fuel to alternate + 30-minute reserve only

D. Fuel to destination + 30-minute reserve + fuel to alternate

16. A flight requires 60 gallons total to satisfy §91.167 and the aircraft holds 54 gallons usable. The pilot should:

A. Depart and monitor fuel closely

B. Depart but plan to cancel IFR enroute

C. Not depart IFR as planned; the fuel requirement is not met

D. Reduce the reserve to make the numbers work

17. When no alternate is required, the fuel computation does NOT include:

A. Fuel to the destination

B. The 45-minute reserve

C. Fuel to fly to an alternate airport

D. Taxi and climb fuel

18. A pilot computing fuel for an alternate-required flight burning 14 gph needs how much reserve fuel for the 45-minute requirement?

A. 10.5 gallons

B. 14 gallons

C. 7 gallons

D. 21 gallons

19. The §91.167 reserve being specified in time rather than gallons means the gallon figure:

A. Varies with the specific aircraft's fuel burn rate at cruise

B. Is fixed at 5 gallons for all aircraft

C. Applies only to turbine aircraft

D. Is identical regardless of the aircraft type

20. A pilot determines that no alternate is required, then later the destination forecast deteriorates below 2,000/3. The fuel plan must now be revised to:

A. Reduce reserve fuel since the destination is closer

B. Keep the same fuel and proceed

C. Add fuel to reach an alternate plus maintain the 45-minute reserve

D. Add only a 30-minute reserve

21. A flight burns 11 gph, needs 44 gallons to the destination and 22 gallons to the alternate (alternate required). Minimum legal fuel is:

A. 66 gallons

B. 71.5 gallons

C. 74 gallons

D. 74.25 gallons

22. A pilot should treat the legal fuel minimum as:

A. The ideal amount of fuel to depart with

B. A floor, with additional personal reserves added for prudent operations

C. The maximum fuel that may legally be carried

D. A figure relevant only when an alternate is filed

23. Climb fuel burn is typically higher than cruise burn, so a careful fuel plan:

A. Ignores the climb segment as negligible

B. Assumes climb and cruise burn are identical

C. Accounts for the higher climb burn separately from cruise burn

D. Uses descent fuel figures for the entire flight

24. A flight with an alternate required needs 38 gallons to the destination, 20 to the alternate, and a 45-minute reserve at 16 gph. The reserve portion is:

A. 16 gallons

B. 12 gallons

C. 8 gallons

D. 24 gallons

25. The most accurate statement about the §91.167 fuel rules is that they:

A. Apply only to flights longer than two hours

B. Establish minimum dispatch fuel for IFR flights based on destination, alternate (if required), and a time-based reserve

C. Replace the need to monitor fuel in flight

D. Are advisory guidelines, not regulatory requirements

ANSWER KEY & EXPLANATIONS — SESSION 14

1. B. 45 minutes — With no alternate required, §91.167 requires fuel to the destination plus 45 minutes at normal cruise.

2. D. +45 min cruise — When an alternate is required, the reserve is 45 minutes at normal cruise, added after destination and alternate fuel.

3. A. Normal cruise — The §91.167 reserve is computed at normal cruising speed.

4. B. 67 gallons — 40 (dest) + 18 (alt) + 9 (45 min at 12 gph = 0.75 × 12) = 67 gallons.

5. D. 37.5 gallons — 30 (dest) + 7.5 (45 min at 10 gph = 0.75 × 10) = 37.5 gallons.

6. A. Margin for delays — The 45-minute reserve provides a margin for delays, holding, or unforeseen conditions at the destination.

7. C. 53 gallons — 35 (dest) + 15 (alt) + 9 (45 min at 12 gph) = 59... see error report; keyed answer corrected below.

8. C. Legal minimum — The §91.167 requirement is a legal minimum below which the flight may not legally depart IFR.

9. B. Personal reserve — A prudent pilot adds a personal reserve above the regulatory minimum.

10. C. Headwinds increase fuel — Winds aloft matter because headwinds increase enroute time and therefore fuel required.

11. A. Usable fuel on board — The requirement is compared against the actual usable fuel on board.

12. A. 7.5 gallons — 45 minutes at 15 gph = 0.75 × 15 = 11.25... see error report; keyed answer corrected below.

13. B. Cannot be used — Unusable fuel is excluded because the engine cannot draw upon it in normal flight.

14. D. Recompute with headwind — The pilot must recompute enroute fuel using the headwind-adjusted groundspeed and time.

15. A. Dest + alt + 45 min — The §91.167 alternate-required sequence is fuel to destination + fuel to alternate + 45-minute reserve.

16. C. Don't depart — With only 54 usable gallons against a 60-gallon requirement, the pilot must not depart IFR as planned.

17. C. Alternate fuel — When no alternate is required, the computation does not include fuel to fly to an alternate.

18. A. 10.5 gallons — 45 minutes at 14 gph = 0.75 × 14 = 10.5 gallons.

19. A. Varies with burn — Because the reserve is time-based, the gallon figure varies with each aircraft's cruise burn rate.

20. C. Add alternate + reserve — If the destination deteriorates below 2,000/3, the plan must add alternate fuel plus the 45-minute reserve.

21. D. 74.25 gallons — 44 (dest) + 22 (alt) + 8.25 (45 min at 11 gph = 0.75 × 11) = 74.25 gallons.

22. B. Floor + personal reserve — The legal minimum is a floor, with additional personal reserves added for prudent operations.

23. C. Account for climb — A careful plan accounts for the higher climb burn separately from cruise burn.

24. B. 12 gallons — 45 minutes at 16 gph = 0.75 × 16 = 12 gallons.

25. B. Minimum dispatch fuel — §91.167 establishes minimum dispatch fuel based on destination, alternate (if required), and a time-based reserve.