SESSION 76: EMERGENCIES — APPROACH WITH LOSS OF PRIMARY FLIGHT INSTRUMENTS

1. Having recognized the vacuum failure, your first priority is to:

A. Navigate to the approach

B. Maintain aircraft control on partial panel (turn coordinator, pitot-static instruments, compass)

C. Talk to ATC

D. Configure for landing

2. You should advise ATC of the failure and:

A. Declare the situation, state your equipment status, and request assistance and a suitable approach

B. Squawk 7500

C. Continue without telling ATC

D. Climb above the clouds

3. When choosing which approach to fly partial panel, the preferred choice is one that:

A. Has the lowest minimums

B. Requires a procedure turn

C. Is at the highest elevation

D. Minimizes maneuvering — ideally a straight-in with vectors to final and a long, stable final segment

4. Requesting radar vectors to final is helpful on partial panel because it:

A. Lowers the minimums

B. Reduces the navigation and turning workload, letting ATC line you up on final

C. Eliminates the missed approach

D. Charges the vacuum pump

5. A precision or vertically-guided approach (ILS/LPV) may be preferred partial panel because:

A. It requires less fuel

B. It needs no charts

C. It eliminates the compass error

D. The continuous glidepath reduces the workload of managing step-down descents

6. On partial panel, you control bank and keep the wings level using the:

A. Failed attitude indicator

B. Altimeter

C. Turn coordinator (and coordination ball)

D. Airspeed indicator

7. You control pitch on partial panel using the:

A. Turn coordinator

B. Heading indicator

C. Magnetic compass

D. Altimeter, VSI, and airspeed indicator

8. To turn to a new heading on final approach partial panel, you use a:

A. Timed standard-rate turn referencing the turn coordinator, rolling out using the compass (allowing for its errors)

B. Steep turn

C. The failed heading indicator

D. The VSI

9. Holding the localizer or final approach course partial panel requires:

A. The attitude indicator

B. Small, smooth heading corrections using the turn coordinator and the CDI, with compass cross-reference

C. Large bank corrections

D. The VSI only

10. Managing the descent on the glidepath/profile partial panel is done with:

A. Pitch (via the pitot-static instruments) and power, in small adjustments

B. The attitude indicator

C. The heading indicator

D. The magnetic compass

11. A stabilized partial-panel approach is even more important than normal because:

A. The minimums are lower

B. The compass works better

C. The autopilot is required

D. The reduced instrument reference makes large corrections harder to manage and more destabilizing

12. If the aircraft has an autopilot that does not depend on the failed vacuum instruments, the pilot may:

A. Disregard it

B. Use it to reduce workload, if it remains reliable, while monitoring

C. Rely on it without monitoring

D. Turn it off

13. If the autopilot uses the failed attitude/heading gyros for its reference, the pilot should:

A. Continue using it

B. Not use it, since it would follow the erroneous reference

C. Trust it on final only

D. Use it for the missed approach only

14. During the partial-panel approach, ATC can further assist by:

A. Lowering the minimums

B. Cancelling the approach

C. Resetting your transponder

D. Providing no-gyro vectors (turn left/right, stop turn) that you fly using the turn coordinator

15. A "no-gyro" approach means ATC issues turn instructions and you:

A. Use the heading indicator

B. Use the attitude indicator

C. Fly direct

D. Make standard-rate (or half-standard-rate below the FAF) turns on the instruction "turn left/right" until "stop turn"

16. Below the final approach fix on a no-gyro approach, ATC expects you to make turns at:

A. Standard rate

B. Maximum bank

C. Half standard rate

D. No turns

17. Reaching the DA/MDA on the partial-panel approach without the required visual references, you:

A. Descend to find the runway

B. Level off and continue

C. Execute the missed approach (partial panel)

D. Land

18. The partial-panel missed approach is more demanding because the pilot must:

A. Use the attitude indicator

B. Simultaneously climb, configure, and navigate without the primary attitude/heading references, relying on the cross-check

C. Land regardless

D. Disregard the turn coordinator

19. During the partial-panel missed approach climb, pitch is set by:

A. The attitude indicator

B. The heading indicator

C. The compass

D. Power and the pitot-static instruments (airspeed/VSI/altimeter) showing the climb

20. A pilot who must fly a partial-panel approach in actual IMC should, if conditions allow:

A. Choose a destination with the best weather/lowest workload and consider declaring an emergency for priority handling

B. Continue to the original destination regardless

C. Squawk 7500

D. Descend below minimums

21. Declaring an emergency during a partial-panel approach:

A. Is never appropriate

B. Cancels the IFR clearance

C. Allows ATC to give priority and assistance and removes hesitation about requesting help

D. Requires squawking 7500

22. The single most important factor in successfully flying a partial-panel approach is:

A. A disciplined, continuous cross-check of the remaining instruments with smooth control inputs

B. The autopilot

C. The magnetic compass alone

D. The DME

23. Practicing partial-panel approaches in training builds:

A. The proficiency to complete an approach safely when the primary gyros fail in IMC

B. VFR skills only

C. The ability to ignore the cross-check

D. Vacuum pump knowledge

24. Throughout the partial-panel approach, the pilot's priority order remains:

A. Communicate, navigate, aviate

B. Navigate, aviate, communicate

C. Aviate (maintain control), navigate (fly the approach), communicate (use ATC)

D. Configure, aviate, navigate

25. The fundamental principle of flying an approach with lost primary instruments is that the pilot must:

A. Trust the failed instruments

B. Descend below minimums to find the runway

C. Maintain control on partial panel, use ATC assistance (vectors/no-gyro), choose a low-workload approach, fly stabilized with a disciplined cross-check, and go missed if the references are not in sight

D. Always use the autopilot

ANSWER KEY & EXPLANATIONS – SESSION 76

1. B. Maintain control — Having recognized the failure, the first priority is to maintain aircraft control on partial panel.

2. A. Declare/request — The pilot advises ATC of the failure, states equipment status, and requests assistance and a suitable approach.

3. D. Minimize maneuvering — The preferred partial-panel approach minimizes maneuvering — ideally a straight-in with vectors to final and a long, stable final segment.

4. B. Reduce workload — Radar vectors to final reduce the navigation and turning workload, letting ATC line the aircraft up on final.

5. D. Continuous glidepath — A precision/vertically-guided approach reduces the workload of managing step-down descents via its continuous glidepath.

6. C. Turn coordinator/ball — Bank is controlled and the wings kept level using the turn coordinator (and coordination ball).

7. D. Pitot-static — Pitch is controlled on partial panel using the altimeter, VSI, and airspeed indicator.

8. A. Timed standard-rate turn — A turn to a new heading partial panel uses a timed standard-rate turn referencing the turn coordinator, rolling out using the compass.

9. B. Small corrections/CDI — Holding the final course partial panel requires small, smooth heading corrections using the turn coordinator and the CDI, with compass cross-reference.

10. A. Pitch + power — The descent on partial panel is managed with pitch (via the pitot-static instruments) and power, in small adjustments.

11. D. Hard to recover from large corrections — A stabilized partial-panel approach is more important because the reduced instrument reference makes large corrections harder to manage and more destabilizing.

12. B. Use if reliable/monitor — If the autopilot does not depend on the failed instruments, the pilot may use it to reduce workload, while monitoring.

13. B. Don't use — If the autopilot uses the failed gyros for reference, the pilot should not use it, since it would follow the erroneous reference.

14. D. No-gyro vectors — ATC can provide no-gyro vectors (turn left/right, stop turn) that the pilot flies using the turn coordinator.

15. D. Standard-rate on instruction — A no-gyro approach has the pilot make standard-rate (or half-standard-rate below the FAF) turns on "turn left/right" until "stop turn."

16. C. Half standard rate — Below the FAF on a no-gyro approach, ATC expects turns at half standard rate.

17. C. Missed approach — Reaching the DA/MDA without the required visual references, the pilot executes the (partial-panel) missed approach.

18. B. Climb/configure/navigate via cross-check — The partial-panel missed approach is demanding because the pilot must simultaneously climb, configure, and navigate without the primary references, relying on the cross-check.

19. D. Power + pitot-static — During the partial-panel missed approach climb, pitch is set by power and the pitot-static instruments showing the climb.

20. A. Best weather/declare — If conditions allow, the pilot chooses a destination with the best weather/lowest workload and considers declaring an emergency for priority.

21. C. Priority/assistance — Declaring an emergency allows ATC to give priority and assistance and removes hesitation about requesting help.

22. A. Disciplined cross-check — The most important factor is a disciplined, continuous cross-check of the remaining instruments with smooth control inputs.

23. A. Proficiency — Practicing partial-panel approaches builds the proficiency to complete an approach safely when the primary gyros fail in IMC.

24. C. Aviate/navigate/communicate — The priority order remains aviate (maintain control), navigate (fly the approach), communicate (use ATC).

25. C. Control/ATC/low-workload/stabilized/miss — The fundamental principle is to maintain control on partial panel, use ATC assistance, choose a low-workload approach, fly stabilized with a disciplined cross-check, and go missed if the references are not in sight.