

## Task B. Precision Approach

**References:** 14 CFR part 91; AC 90-105, AC 90-107; AIM; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-15, FAA-H-8083-16, FAA-H-8083-25; Terminal Procedures Publications

**Objective:** To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing precision approach procedures solely by reference to instruments.

**Note:** See Appendix 3: Aircraft, Equipment, and Operational Requirements & Limitations for information related to this Task.

**Knowledge:** The applicant demonstrates understanding of:

- **IR.VI.B.K1** Procedures and limitations associated with a precision approach, including determining required descent rates and adjusting minimums in the case of inoperative equipment. **1**
- **IR.VI.B.K2** Navigation system displays, annunciations, and modes of operation.
- **IR.VI.B.K3** Ground-based and satellite-based navigation systems (orientation, course determination, equipment, tests and regulations, interference, appropriate use of navigation data, signal integrity). **\***
- **IR.VI.B.K4** A stabilized approach, including energy management concepts. **2 \***

**Risk Management:** The applicant is able to identify, assess, and mitigate risk associated with:

- **IR.VI.B.R1** Deviating from the assigned approach procedure.
- **IR.VI.B.R2** Selecting a navigation frequency.
- **IR.VI.B.R3** Management of automated navigation and autoflight systems. **3 \* \***
- **IR.VI.B.R4** Aircraft configuration during an approach and missed approach. **\***
- **IR.VI.B.R5** An unstable approach, including excessive descent rates.
- **IR.VI.B.R6** Deteriorating weather conditions on approach.
- **IR.VI.B.R7** Continuing to descend below the Decision Altitude (DA)/Decision Height (DH) when the required visual references are not visible. **4**

**HOW IS THIS TESTED?** You know how this is tested, too. Just get those needles centered and stable early. Watch for changes in wind as you descend (on your PFD if you have that info) so you can stay ahead of small corrections to stay centered all the way to DA.

### 1 | Practice with Charts from Far Flung Places

You'll know how to read the charts for your standard training approaches, but don't stop there. Practice reading random ones from other parts of the country. Talk to your instructor if you're having trouble understanding the notes or restrictions on an approach chart. — *David G. (DPE)*

### 2 | Choose the Right Pitch Vs. Power

I witness applicants using the throttle to stay on the glideslope and the pitch to control their speed. That's how they were taught as student pilots to manage a stabilized approach to a visual landing. But instrument attitude flying works best the other way around. Use the *elevator* to stay on the glideslope and the *throttle* to manage the speed. — *Doug S. (DPE)*

### 3 | You Will Use That Autopilot at Least Once

I expect that by the time an applicant has been recommended for the test, they know how to manage their automation. I require at least one approach flown coupled up to the autopilot, if one is installed and working.

Not all autopilots are equal. Some will only maintain the lateral elements of the approach while the pilot manually controls pitch and power. Some two-axis autopilots will fly both lateral and vertical in NAV mode. Others require APR mode once inside the IF but before the glideslope intercept.

Know how to manage the automation installed in your test airplane. — *Doug S. (DPE)*

### 4 | The Missed Must Commence at DA/DH

I want to hear more than just, "don't descend below the DA/DH." The candidate should be able to describe the dangers of continuing and why starting a missed approach below DA/DH is so dangerous. — *David G. (DPE)*



Can you go below DA during a missed approach? Yes, so long as the action to begin the missed approach starts as you reach DA. That's where the decision must happen—including beginning to implement that decision. The airplane may continue down a few feet before it begins to climb again. That is accounted for in the protected airspace. — *PilotWorkshops*

PRECISION APPROACH (CONTINUED)

- **Skills:** The applicant exhibits the skill to:
- **IR.VI.B.S1** Accomplish the precision instrument approach(es) selected by the evaluator.
- **IR.VI.B.S2** Establish two-way communications with air traffic control (ATC) appropriate for the phase of flight or approach segment, and use proper communication phraseology. ✖
- **IR.VI.B.S3** Select, tune, identify, and confirm the operational status of navigation equipment to be used for the approach.
- **IR.VI.B.S4** Comply with all clearances issued by ATC or the evaluator. ✖
- **IR.VI.B.S5** Recognize if any flight instrumentation is inaccurate or inoperative, and take appropriate action. 5
- **IR.VI.B.S6** Advise ATC or the evaluator if unable to comply with a clearance.
- **IR.VI.B.S7** Complete the appropriate checklist(s).
- **IR.VI.B.S8** Establish the appropriate aircraft configuration and airspeed considering meteorological and operating conditions. 6 ✖

**5 | Glideslope Problem = Missed Approach**

Whether it's an ILS glideslope or LPV glidepath, call out when the vertical guidance comes alive. (You should also do this with lateral guidance whenever a localizer needle you're going to intercept begins to move.) If you're approaching the expected glideslope/glidepath intercept point and that needle is flagged or not moving, the safe choice is a missed approach. Don't wait too long with a "dead diamond" or the examiner will wonder if you saw the malfunction, or if you're unsure what to do.

There is the option to fly the approach non-precision in the real world when a glideslope fails or an LPV approach downgrades to LNAV. But that requires pre-briefing on the different minimums and other potential notes. It's not something to do on the fly ... or on the test. — *Elaine K. (CFI)*

**6 | Anticipate the Effect of Changing Winds**

The effect of wind on the approach should not be a surprise. I've seen many approaches on rides start to come unraveled right at intercept because no thought had been put into the effect of wind on the flight path.

Wind shear can be quite dangerous so don't be surprised if you get a question about it on the preflight ground portion of the test.

In the air, I once watched an approach that started out OK fall apart when the strong headwind on the approach disappeared. The upper winds were strong but the airport reported winds were calm so this was entirely foreseeable. — *David G. (DPE)*

*When you start doing approaches in training, be sure to do the first few with the hood off. You can't log those as instrument time, but it's essential to see how a half scale deflection that seems like it requires a big correction actually is so small near DA that you might not even fix it if you were VFR. — PilotWorkshops*



PRECISION APPROACH (CONTINUED)

- **IR.VI.B.S9** Maintain altitude  $\pm 100$  feet, selected heading  $\pm 10^\circ$ , airspeed  $\pm 10$  knots, no more than  $\frac{3}{4}$  scale CDI deflection, and accurately track radials, courses, or bearings, prior to beginning the final approach segment. ✖✖
- IR.VI.B.S10** Adjust the published DA/DH and visibility criteria for the aircraft approach category, as appropriate, to account for NOTAMS, inoperative aircraft or navigation equipment, or inoperative visual aids associated with the landing environment. ✖
- IR.VI.B.S11** Establish a predetermined rate of descent at the point where vertical guidance begins, which approximates that required for the aircraft to follow the vertical guidance.
- IR.VI.B.S12** Maintain a stabilized final approach from the final approach fix (FAF) to DA/DH allowing no more than  $\frac{3}{4}$ -scale deflection of either the vertical or lateral guidance indications, and maintain the desired airspeed  $\pm 10$  knots. 7
- IR.VI.B.S13** Immediately initiate the missed approach procedure when at the DA/DH, and the required visual references for the runway are not unmistakably visible and identifiable.
- IR.VI.B.S14** Transition to a normal landing approach (missed approach for seaplanes) only when the airplane is in a position from which a descent to a landing on the runway can be made at a normal rate of descent using normal maneuvering.
- IR.VI.B.S15** Maintain a stabilized visual flight path from the DA/DH to the runway aiming point where a normal landing may be accomplished within the touchdown zone. 8
- IR.VI.B.S16** Use a multi-function display (MFD) and other graphical navigation displays, if installed, to monitor position, track wind drift, and to maintain situational awareness. ✖
- IR.VI.B.S17** Use single-pilot resource management (SRM) or crew resource management (CRM), as appropriate. ✖✖

Even though an ILS approach is the only type of common precision approach by definition, an LPV approach satisfies the precision approach requirement for the checkride. There was originally a requirement of a DA is 300 feet or lower, but that no longer appears in the ACS. However, you should consider planning for one with a low DH just in case your examiner demands it. —PilotWorkshops

7 | Factor in a Groundspeed Estimate

Estimate your groundspeed in advance to help you determine the anticipated descent rate. If you plan to fly the approach at 90 knots and there's a 10-knot headwind aloft, use your E6B or descent table in the Terminal Procedures Publication (TPP) to determine vertical speed required to fly the common  $3^\circ$  descent angle. Keep in mind too that the wind speed typically slows as you descend towards the ground, so your descent rate will pick up as you near the DA. —PilotWorkshops

An approach is a funnel. The closer you get, the narrower the funnel gets. This means big corrections close in tend to make things worse, not better. The earlier you fix lateral or vertical deviations, the higher the probability of a successful approach. —David G. (DPE)

8 | Look Up, But Stay on Glidepath

When I tell the applicant on an approach to "look out the window," the vast majority drop below the glidepath.

I want to see every pilot stay on the glidepath all the way to the runway. I'm convinced that many of the fatal accidents that occur when an airplane crashes short of the runway on an instrument approach (especially at night) are because the pilot didn't have the discipline to stay on the glidepath all the way to the runway. —Doug S. (DPE)

