



Circling Minima and Straight-in Landings

By Steven E. Bergner

Q If an IFR approach procedure has only circle-to-land minima that are limited to Category A, B and C aircraft (Figure 1), is it legal for a Category D airplane to fly the procedure, provided the approach is made straight-in? — Gulfstream II pilot

A No.

There are several aspects to this question. First, a brief review of some pertinent regulations and AIM advice:

FAR Part 97.3 (b) states, "Aircraft approach category' means a grouping of aircraft based on a speed of 1.3 V_{SO} (at maximum certificated landing weight). V_{SO} and the maximum certificated landing weight are those values as established for the aircraft by the certifying authority of the country of registry. The categories are as follows:

- (1) Category A: Speed less than 91 knots.
- (2) Category B: Speed 91 knots or more but less than 121 knots.
- (3) Category C: Speed 121 knots or more but less than 141 knots.
- (4) Category D: Speed 141 knots or more but less than 166 knots.
- (5) Category E: Speed 166 knots or more."

Note that an aircraft's approach category is determined solely by its 1.3 V_{SO} at the maximum certificated landing weight. While airspeeds at actual operating weights may be less, they have no bearing on an aircraft's approach category.

Next, the AIM 5-4-7 (a) says that higher circling minima may be appropriate according to the actual speed being flown: ". . . If it is necessary, while circling-to-land, to maneuver at speeds in excess of the upper limit of the speed range for each

category, due to the possibility of extending the circling maneuver beyond the area for which obstruction clearance is provided, the circling minimum for the next higher approach category should be used. For example, an aircraft which falls in Category C, but is circling to land at a speed of 141 knots or higher should use the approach category 'D' minimum when circling to land."

This is especially critical advice — as TERPS provides no buffers for circling approaches. Pilots should consider the containment areas as having *vertical sides made of concrete* extending high above the wingtips — there is absolutely zero protection outside the circling area. It is entirely appropriate to use higher minima when flap configuration, company SOP, turbulence, etc., requires increased maneuvering speed (Figure 2).

So, it's not only illegal to fly an approach limited to Cat A-C aircraft in a Cat D airplane, it's also very unwise to circle-to-land at speeds in excess of the 140-knot Cat C limitation in any aircraft. Failure to heed this advice can have catastrophic consequences. Further, one should note that U.S. TERPS criteria use much smaller circle-to-land maneuvering areas than those specified by ICAO PANS-OPS. Pilots based outside of the United States may be surprised at the magnitude of differences — especially in the Cat C and D areas used by most jet aircraft. Charted airspeed limitations merit special attention when planning any circle-to-land operation.

The second part of the reader's question, ". . . but what if I'm planning to land straight in? Can I fly the approach [which is limited to Cat A-C

aircraft] in my Cat D airplane under those circumstances?" warrants an emphatic answer: Absolutely not!

Obstacle assessment for a circling-only approach isn't limited to the designated circling area. The procedure designer also must ensure that the initial, intermediate, final and missed approach segments are flyable by all aircraft that will use the procedure. This means that turn radii considerations will be applied throughout.

Once those designing an approach determine that a procedure must be limited to certain approach categories, the smaller containment areas are used to obtain the lowest possible operating minima. This concept has significant implications to airspeed control and turn radius.

For example, obstacles just beyond the airport may require that a missed approach point be established prior to the airport, a turning missed approach, or both. Just like circling areas, TERPS criteria for turning missed approach procedures use a different turn radius for each approach category. Obviously, excessive speed can increase an airplane's turn radius beyond safe limits.

Ultimately, obstacles are oblivious to approach category legalities; they simply wait — often shrouded in darkness, clouds and precipitation — ready to snare any aircraft straying from protected airspace. **B/CA**

