

WPR22FA068

OPERATIONAL FACTORS

Attachment 7

Circling Approach Safety Alert

June 15, 2023



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Circling Approaches: Know the Risks!

Before conducting a circling approach, be sure it is the best option and then brief the approach, plan its execution, and acknowledge your own limitations.

The problem

- Circling approaches can be riskier than other types of approaches because they often require maneuvering at low altitude and low airspeed during the final segment of the approach, increasing the opportunity for loss of control or collision with terrain. These risks are heightened when conducting circling approaches in marginal or reduced visibility conditions and increased focus is required.
- While circling approaches might be necessary to accommodate traffic flow at airports, or are advantageous due to wind conditions, pilots sometimes do not evaluate the risks of these approaches fully before accepting them, which can result in unstabilized approaches.
- Often, circling approaches do not allow for stabilized approach criteria to be met. Approaches should be stabilized by 1,000 feet height above touchdown (HAT) in instrument meteorological conditions (IMC), and by 500 feet HAT in visual meteorological conditions (VMC).
- When circling approaches are conducted in IMC, transitioning from instruments to ground references can cause the "illusion of high speed" if the instruments are not properly monitored.

Related accidents

Between 2008 and 2023, there have been 10 accidents involving Part 91 and Part 135 operators that occurred during a circling approach.¹ These accidents involved 17 fatalities. Following are three fatal accidents involving circling approaches:

- During a Part 135 flight, a Learjet 35A departed controlled flight and impacted a commercial building while on a circling approach during day visual conditions. Four minutes before the accident, the visibility was reported as 10 statute miles or more, scattered clouds were reported at 5,500 ft above ground level (agl), and wind was from 330° at 19 kts gusting to 29 kts. The flight crew had been cleared by air traffic control (ATC) for the instrument landing system (ILS) runway 6 approach, circle to runway 1 (see figure 1). They were cleared for the approach more than 50 miles from the airport and had plenty of time to adequately prepare and brief the approach. However, the flight crew never briefed the approach and had difficulty becoming established on the ILS runway 6 approach because of a series of procedural deviations and errors. The airplane crossed the final approach fix (FAF) hundreds of feet above the altitude specified by the approach procedure, despite ATC reminding the flight crew twice about the minimum altitude for the FAF. The flight crew continued toward runway 6 (at an altitude higher than required for the approach) instead of initiating the circling approach at the FAF. Consequently, by the time they initiated the circling approach, the airplane was about 1 mile from the runway 6 threshold and could not be maneuvered to line up with the landing runway. The flight crew continued with the approach, the airspeed decreased during the turn, and the airplane stalled and crashed less than a mile from the runway 1 threshold. The pilot and co-pilot were fatally injured during the accident. **The flight crew had multiple opportunities to recognize and discontinue the unstabilized approach, most notably during the circling segment of the approach. Their lack of situational awareness could have been prevented by briefing the approach and following ATC instructions to become established on the approach and safely maneuvering to land.**

¹ The event code used for these events is “approach – circling (IFR)”. There may be other accidents that occurred during a visual flight rules (VFR) circling approach, such as NTSB case number WPR22FA068 described below, that are not captured in this data.



Figure 1. Overhead image showing a stabilized flightpath to runway 1 (in blue) compared with the accident airplane’s flightpath (in yellow) ([NTSB/AAR-19/02](#)).

- A Bombardier CL-600-2B16 impacted terrain following a loss of control during a circling approach. Weather reported near the accident site included 4 statute miles visibility, a broken cloud layer at 2,300 ft agl, and wind from 280° at 11 knots, gusting to 16 kts. The flight crew initially planned for a straight-in RNAV approach to runway 11 (see figure 2). However, as the airplane neared the airport, ATC advised the flight crew to expect the RNAV runway 20 approach. The flight crew accepted the approach; however, they subsequently requested to circle to runway 11 because runway 20 was too short to meet their landing distance

requirement. After the airplane was established on the RNAV runway 20 approach, ATC offered the flight crew the option of entering the left downwind leg for runway 11 or crossing over the airport and entering a left downwind for runway 29. The flight crew maneuvered the airplane to enter the traffic pattern for runway 11. They continued circling past the runway 11 extended centerline and entered a nose down attitude and steep left turn, as it maneuvered close to the ground. The pilot, co-pilot, and four passengers were fatally injured. **The flight crew had many options available to them that would have increased the likelihood of executing a stabilized approach and successful landing, such as: requesting the approach they originally planned for, briefing the approach they accepted, or performing a missed approach procedure.**



Figure 2. Flightpath of the airplane with curved arrows indicating the initiation of the circling approach to runway 11 ([WPR21FA286](#)).

- A Learjet 35A struck power lines while performing a circling approach to the runway at night in deteriorating weather conditions. The flight crew initiated the GPS runway 17 approach and were cleared to land by ATC. About 4 minutes later, the pilot requested to land on runway 27. The controller instructed the pilot to overfly the airport and enter left traffic for runway 27R and subsequently cleared him to land. Shortly after, the pilot requested that the runway lights be increased; the controller responded they were already at 100 percent. Preliminary automatic dependent surveillance-broadcast data indicated the airplane overflow the airport at an altitude of 407 ft above ground level and then began a climbing turn to align with runway 27R. The airplane struck power lines and impacted the ground about a mile from the approach end of runway 27R, resulting in fatal injuries to the two pilots and two flight nurses. Recorded weather data indicated the visibility was 3 statute miles at the time of the accident and there was a broken cloud layer at 2,000 ft agl. **Instead of attempting a landing from an unstabilized approach in poor visibility, the flight crew could have initiated a missed approach procedure and attempted a landing to a different runway or diverted to another airport due to the weather.**



Figure 3. Overhead image of the airplane's flightpath toward runway 27R ([WPR22FA068](#)).

What can you do?

- **Fully understand the risks involved with performing a circling approach and use sound judgment if deciding to perform this approach.**
- **Consider your personal experience and limitations and the performance capabilities of your aircraft when planning the execution of the circling approach. Weather, runway configuration, and your aircraft's current position, altitude, and airspeed should also be considered.**
- **Understand that if ATC issues you a clearance for a circling approach, you can request a different approach or divert to an airport with more capable approach facilities. It is always better to make ATC aware of your concerns rather than to attempt an approach you might not be comfortable performing.**
- **Acquire recurring, scenario-based training in realistic environments that includes circling approaches. Practicing these approaches routinely will increase your proficiency and make you more comfortable performing them when needed.**

- **If you decide to perform a circling approach, conduct a comprehensive briefing that specifies when the circling approach will begin, descent altitudes and locations, airspeeds, aircraft configuration, and go-around (or missed approach) criteria and procedures.**
- **When conducting a circling approach, remain at or above the circling altitude until the aircraft is continuously in a position from which a descent to a landing on the intended runway can be made at a normal rate using normal maneuvers.**
- **To ensure the stabilized approach criteria are met while conducting a circling approach, it is imperative that pilots continuously monitor the airplane's altitude even when flying in VMC.**

Interested in more information?

- The Federal Aviation Administration's (FAA's) *Instrument Procedures Handbook*, FAA-H-8083-16B, Chapter 4, "Approaches," discusses the risks involved with circling approaches and the circumstances when they might be performed.



- The FAA's *Aeronautical Information Manual*, Section 4, "Arrival Procedures," reminds pilots of the rules and procedures pertaining to circling approaches and the risks and factors they should consider before accepting these approaches.



- NTSB Safety Alert SA-077, "*Stabilized Approaches Lead to Safe Landings*," presents guidelines for maintaining stabilized approaches and reminds pilots not to attempt to "save" an unstabilized approach.



- NTSB Safety Alert SA-023, "*Pilots Manage Risks to Ensure Safety*," outlines the importance of conducting risk management and recognizing your own skill level and proficiency.



The NTSB's Aviation Information Resources web page, <https://www.nts.gov/air>, provides convenient access to NTSB aviation safety products. The reports for the accidents referenced in this safety alert are accessible by NTSB accident number from the [Aviation Accident Database](#) link, and each accident's public docket is accessible from the [Accident Dockets](#) link for the Docket Management System. This Safety Alert can be accessed from the [Aviation Safety Alerts](#) link at www.nts.gov.

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