

Crash During Circling Approach to Runway 1 at Teterboro Airport

Teterboro Airport
Teterboro, New Jersey
May 15, 2017

CEN17FA183

This two-dimensional animated reconstruction shows the sequence of events in the accident, which occurred on May 15, 2017, about 1529 eastern daylight time, when a Learjet 35A, N452DA, departed controlled flight while on a circling approach to runway 1 at Teterboro Airport, Teterboro, New Jersey.

The sequence of events was reconstructed based on information from radar data, the airplane's Enhanced Ground Proximity Warning System (EGPWS), the airplane's cockpit voice recorder (CVR) transcript, Air Traffic Control (ATC) radio communications, and aircraft performance data.

Selected comments from the CVR transcript and ATC communications are displayed as text along with the time they occurred. A sequence of still-image map graphics is used to provide an overview of the circumstances of the accident and the plane's position as time advanced. Still images are followed by a continuous animation of the accident airplane, beginning from 15:27 to the time of the accident at 15:29. The animation does not depict the weather or visibility conditions. The animation is then followed by a video clip showing the airplane crashing in a parking lot less than one mile southwest of the Teterboro airport. The animation includes audio replay of ATC communications and audio narration.

The animation begins with a picture of the accident aircraft, a Learjet 35A, N452DA. An overall map of the area shows the origin of the flight at Philadelphia International Airport, Philadelphia, Pennsylvania, to the destination at Teterboro airport, Teterboro, New Jersey, with a straight-line distance of about 80 nautical miles and a flight time of about 25 minutes. The filed flight plan with a requested altitude of twenty-seven thousand feet for a planned distance of about 120 nautical miles is depicted in white, and the Air Traffic Control cleared route to fly at four-thousand feet is shown in blue. Subsequently, the airplane's actual ground track is shown at selected times over the course of the flight by a white arrow indicating the airplane's position and heading, and the magenta line tracing the ground track.

The wide area map view is changed to a more focused map view displaying the four airports in the area: Teterboro Airport, Newark Liberty International Airport, John F. Kennedy International Airport, and LaGuardia Airport. The location of MetLife stadium south of Teterboro Airport and the navigational waypoints VINGS, DANDY and TORBY are also indicated. Ground tracks of previous aircraft flying the same circling approach that was assigned to the accident airplane are presented as white lines to show typical approach paths. Wind direction and speed is indicated. The orientation for the

Instrument Landing System (ILS) localizer for runway 6 is indicated, and the waypoint TORBY is highlighted as the waypoint where airplanes were typically told to begin the circling approach to runway 1.

The map view again changes to an even more focused map view concentrating on the last 2 minutes of the flight as the airplane approached Teterboro Airport. The position of the airplane is depicted in a continuous real time animation. The right side of the screen shows selected statements from the CVR and ATC transcript as text appearing at the time indicated in the transcript. The statements are attributed to the Captain, the SIC (Second-in-Command) and New York approach (APP-NYC) or Teterboro tower (TWR-TEB). The airplane's airspeed and altitude are indicated at the bottom of the frame, along with the local time.

The animation transitions to a video captured by a security camera showing the airplane as it impacted the ground at a right bank angle of about 125 degrees.

Narration

1. On May 15, 2017, about 3:29 pm eastern daylight time, a Learjet 35A departed controlled flight while flying the ILS Runway 6 Circle-to-Land Runway 1 Approach at the Teterboro Airport, in Teterboro, New Jersey. The Captain and the Second-in-Command died; no one on the ground was injured. The airplane was destroyed by impact forces and post-crash fire.
2. The Part 91 positioning flight departed the Philadelphia International Airport, Philadelphia, Pennsylvania, bound for Teterboro about 3:04 pm. The straight-line distance from Philadelphia to Teterboro was about 80 nautical miles and lasted about 25 minutes. The flight to Teterboro was the crew's third, and last, planned trip for the day.
3. The company had designated the Second-in-Command as a Second-in-Command zero, which meant that he could only perform Pilot Monitoring duties.
4. Company policy required the Captain to always be the Pilot Flying when flying with the Second-in-Command. However, the cockpit voice recording indicated that the Second-in-Command was the Pilot Flying for all but the final fifteen seconds of the accident flight. For most of the flight, the Captain instructed the Second-in-Command in flying the airplane, including flight basics such as altitude and airspeed. The cockpit voice recording also indicated that the crew failed to complete any of the required checklists during the flight, contrary to published guidance in company manuals.
5. The Captain filed an instrument flight rules flight plan with a requested altitude of twenty-seven-thousand feet for a planned distance of about 120 nautical miles, with an estimated time en route of 28 minutes.
6. The crew's planned route is depicted in white.
7. Air Traffic Control cleared them to fly at four-thousand feet. They were cleared for a slightly shorter route, shown in blue.

8. The white arrow indicates the airplane's position and heading, and the magenta line shows the airplane's actual ground track.
9. During the climb and level off at 4,000 feet, the Captain instructed the Second-in-Command to keep the airspeed below the FAA rest restriction of 250 kts for flight below 10,000 feet.
10. Radar data indicated that the crew exceeded the airspeed restriction multiple times during the 25-minute flight.
11. About eight minutes into the flight, when the airplane was only about 54 miles from the Teterboro airport, the Captain requested a higher altitude, not realizing how close they were to the airport. The controller denied the request, saying it would require the airplane to be turned away from Teterboro to be re-sequenced.
12. About 2 minutes later, when the airplane was about 48 nautical miles from the Teterboro Airport, Air Traffic Control began vectoring the airplane for the ILS Runway 6 circle to Runway 1 approach to the Teterboro airport.
13. The cockpit voice recording indicated that the Captain questioned the reason for the vectors and assigned approach, because he told the Second-in-Command that they were still "hundreds of miles away".
14. About 26-seconds later, Air Traffic Control gave a descent clearance.
15. After acknowledging the clearance, the Captain realized that they were close to Teterboro and stated that they would be at Teterboro in 10 minutes.
16. Air Traffic Control began providing radar vectors to intercept the localizer inbound course.
17. While attempting to join the localizer, the Second-in-Command mistook the Newark International Airport for Teterboro, and he told the Captain that he had the runway in sight. The airplane flew through the localizer course of 060°, and shortly after, Air Traffic Control stated the following:
18. The airplane turned left and intercepted the localizer inbound. Air Traffic Control then directed the flight to the waypoint VINGS.
19. While the airplane was inbound to VINGS, the Second-in-Command attempted to transfer the controls to the Captain, but the Captain did not respond, and the Second-in-Command continued to fly the approach
20. Air Traffic Control cleared the airplane for the approach.
21. The pilots did not conduct an approach briefing before beginning the approach, contrary to published guidance in company manuals.
22. The Captain stated to the Second-in-Command that they would be circling to runway 1 and would be descending to the circling minimums of 760 feet.
23. The Teterboro airport is located near the Newark, John F. Kennedy, and LaGuardia airports. To avoid conflicts with those airports, aircraft landing at Teterboro when the wind is from the North are often vectored to approach from the West, then circle to land to the North on runway 1.
24. The white lines show the ground tracks of previous aircraft flying the same circling approach that was assigned to the accident airplane.

25. On the day of accident, the wind was from the northwest at 16 - 20 knots, gusting to 32 knots. The initial approach clearance issued to the airplane was to fly the ILS Runway 6 circle to Runway 1. Airplanes flying this approach were typically told to circle at TORBY, which was 3.8 nautical miles from the approach end of runway 6. After Torby they would turn right and visually fly toward MetLife Stadium, and then turn left to line up with runway 1.
26. About 3 minutes after receiving the approach clearance, Air Traffic Control instructed the flight to do 3 things: 1) Contact Teterboro Tower. 2) Cross DANDY at fifteen hundred feet. 3) Circle at TORBY.
27. The flight crew acknowledged these instructions but failed to do all three: First, they did not contact the tower. Second, the airplane crossed DANDY at 2,000 feet instead of fifteen hundred feet. Third, they did not turn at TORBY.
28. From this point on, the movement of the white airplane symbol and radio communications occur in real time.
29. As the airplane crossed TORBY, the Captain continued to instruct the Second-in-Command, improperly directing him to descend to the minimum descent altitude of 760 feet while the airplane continued straight toward Runway 6, instead of turning right at TORBY and proceeding visually to the runway.
30. 1 1/2 minutes later, the flight crew still had not switched to the tower radio frequency, until told a second time by Air Traffic Control.
31. The Captain continued to instruct the Second-in-Command to descend to 760 feet instead of contacting the tower.
32. The airplane continued toward the airport as the Captain instructed the Second-in-Command to stop the descent.
33. When the airplane was about 1 nautical mile from the end of runway 6, the tower questioned the crew about the turn.
34. While starting the turn to the right, the Second-in-Command told the Captain "Your flight controls." But the captain did not respond.
35. The airplane lost 300 feet in the turn and the Enhanced Ground Proximity Warning System sounded, "500 feet" and "Sink rate, pull up."
36. The Second-in-Command asked the Captain to take the flight controls again, and finally, the Captain took the controls, directed the Second-in-Command to watch the airspeed, and began a high-bank left turn to runway 1.
37. During the turn, the Second-in-Command called 'airspeed' 4 times.
38. The Captain called out "Stall" as the Second-in-Command agreed and repeated 'Airspeed' twice.
39. The Enhanced Ground Proximity Warning System sounded, 'Sink rate, pull up.'
40. A security camera captured the airplane as it impacted the ground at a right bank angle of about 125 degrees.
41. The airplane crashed in a parking lot less than one mile southeast of the Teterboro airport about fifteen seconds after the Captain took the controls.

