



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

March 9, 2018

Specialist's Report

OPERATIONAL FACTORS

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A. ACCIDENT

Location: Duette, Florida
Date: March 4, 2017
Time: 1330 eastern standard time¹
Airplane: Beech BE-60, N39AG

B. OPERATIONAL FACTORS SPECIALIST

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C. SUMMARY

On March 4, 2017, at about 1330 eastern standard time, a Beech BE-60, registration N39AG, was destroyed by impact and a postcrash fire following an uncontrolled descent in Duette, Florida. The private pilot/owner and the flight instructor were fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the instructional flight, which was conducted under the provisions of 14 *Code of Federal Regulations* Part 91.

D. DETAILS OF THE INVESTIGATION

The investigator-in-charge (IIC) had contact with friends of the accident pilot, and they had expressed concerns about communications they had with the pilot the day before the accident. These communications were regarding the pilot's flight with the instructor the day prior to the accident. Based on these concerns, three pilots who had previously flown with the instructor were contacted and the conversations recorded in writing. The records of these conversations are contained in Attachment 1.

E. FACTUAL INFORMATION

1.0 Eyewitness Accounts

According to one set of eyewitness accounts from members of the same family, documented by the IIC, the airplane sounded like it was at a low altitude. The aircraft was flying slow as the aircraft's nose gradually pitched up. The plane suddenly banked to one side and entered a spiraling descent. The engine sound was smooth and continuous throughout. The engine sound increased during the descent, until the airplane disappeared from view, and sound of impact was heard.

¹ All times are central daylight time (CDT) based on a 24-hour clock, unless otherwise noted.

The witnesses were described by the IIC as familiar with airplanes and their engine sounds, and airplanes frequently flew and maneuvered over their property. They witnessed the descent from their property, at a point less than 1 mile from the accident site.

A group of motorcyclists also viewed the airplane's descent from a state highway adjacent to the accident site. They described to the IIC watching the airplane as it departed straight and level flight and entered a near-vertical spiraling descent. The group could not hear any sounds from the airplane's engines because of the noise of their motorcycles.

2.0 Information from Pilot's Friends Received Prior to the Accident

The accident occurred on the second day of flight training that the pilot was receiving from the instructor. (The pilot had a multiengine rating, and was receiving the flight training in his newly acquired airplane in order to meet insurance requirements.)

In the evening of the first day (the night before the accident), the pilot had communicated with three friends regarding his first day of flight with the instructor. See Attachment 2 for details of these communications.

One friend was not a pilot, but had 100-200 hours of flight experience as a passenger in the right seat of a light, twin-engine airplane. He had also flown on many occasions with the accident pilot, and had considered him an excellent pilot. The friend had received a call from the accident pilot on the evening prior to the accident. The accident pilot had completed a flight that day with the same instructor he would be with during the accident flight. After the conversation, the friend felt that the pilot had been through a stressful day. The friend stated that the pilot mentioned two specific items which he felt were unsafe.

He stated that the instructor had him land on runways that were not the best choice based on wind direction, and that he sought to amplify the difficulty of landing due to the crosswinds that existed during the flight.

The second item was during practice recovery from a power-off stall with a turn. As the pilot was using the standard technique of lowering the nose to recover from the stall, the instructor had advanced the power levers, and the plane had entered "a spin". After losing 1,000 feet, full control of the airplane was achieved at an altitude of 2,000 feet. Both the pilot and the instructor were surprised and frightened by this event, and they landed soon afterwards.

Another friend, who was an ATP-rated pilot and a multi-engine rated flight instructor, reported a similar conversation with the accident pilot the evening before the accident. The first item the pilot mentioned was the instructor's non-standard practice of not advancing the propeller controller or fuel mixture control prior to landing. The pilot had stated that this was the standard practice, but the instructor had said that these actions were not necessary.

The pilot also told his friend about how the instructor was advocating a non-standard stall recovery method. The instructor told him to first add power, then lower the nose and level the wings. This was contrary to what the pilot had been taught and to what is standard airmanship practice, which

was to lower the nose first, then level the wings and add power. The pilot stated that when he used the instructor's technique to recover from a power-off stall with a turn, the airplane entered a spin. It completed one and a half turns before they recovered. The pilot stated he had started at 3,000 feet altitude, but did not say at what altitude they recovered. When the pilot expressed concern about this technique, and the resulting spin, the instructor had stated that it was not a spin because the airplane had not completed three turns.

A third friend relayed another conversation with the accident pilot that occurred the evening prior to the accident. This friend was also a pilot who had owned several different Beechcraft BE-60 airplanes. The pilot had told him of an event that day which had deeply scared him. He said they were practicing slow-flight with a transition to a power-on stall. When the airplane started to stall, the instructor reduced the power on the right engine to idle, causing the airplane to go inverted. They had started at 3,000 feet, and did not recover until reaching 1,800 feet. The instructor stated he didn't expect the airplane to do that.

3.0 Standard Procedures for Flight Training

For stall and stall recovery practice in multiengine airplanes, the FAA publication Airplane Flying Handbook, Chapter 12, Transition to Multiengine Airplanes stated the following in part:

...the most important stall recovery step in a multiengine airplane is the same as it is in all airplanes: reduce the angle of attack (AOA).

Following a reduction in the AOA and the stall warning being eliminated, the wings should be rolled level and power added as needed. Immediate full application of power in a stalled condition has an associated risk due to the possibility of asymmetric thrust. In addition, single-engine stalls or stalls with significantly more power on one engine than the other should not be attempted due to the likelihood of a departure from controlled flight and possible spin entry. Similarly, simulated engine failures should not be performed during stall entry and recovery.

It is recommended that stalls be practiced at an altitude that allows recovery no lower than 3,000 feet AGL (above ground level) for multiengine airplanes, or higher if recommended by the AFM/POH. Losing altitude during recovery from a stall is to be expected.

No multiengine airplane is approved for spins, and their spin recovery characteristics are generally very poor. It is therefore necessary to practice spin avoidance and maintain a high awareness of situations that can result in an inadvertent spin.

In order to spin any airplane, it must first be stalled. At the stall, a yawing moment must be introduced. In a multiengine airplane, the yawing moment may be generated by rudder input or asymmetrical thrust. It follows then that spin awareness be at its greatest during V_{mc}^2 demonstrations, stall practice, slow flight, or any condition of high asymmetrical

² V_{mc} is defined as the minimum airspeed at which directional control can be maintained in a multiengine airplane while flying with the critical engine inoperative.

thrust, particularly at low speed/high AOA. Single-engine stalls are not part of any multiengine training curriculum.

The FAA publication Flight Instructor Airplane Practical Test Standards, which provides the standards for flight instructor evaluation, stated the following in part:

Stalls must not be performed with one engine at reduced power or inoperative and the other engine developing effective power.

The FAA publication Private Pilot-Airplane Airmen Certification Standards, when listing skills required for demonstrating slow flight and stalls in multiengine airplanes, stated the following in part:

Select an entry altitude that will allow the task to be completed no lower than 3,000 feet AGL.

4.0 The Flight Instructor

According to a 2014 information sheet provided by the flight training company that the flight instructor had contracted with at the time of the accident, the instructor had the following flight times:

- Total time- 20,900 hours
- Multiengine time- 9,355 hours
- Flight Instruction given- 18,900 hours
- Time in type (BE-60)- 165 hours

The information sheet showed a history of flight instruction experience spanning the last 40 years. The instructor had owned a flight school, had been a chief pilot and FAA-designated examiner at a 14 CFR Part 141 pilot school that was part of a university aviation program, a flight instructor for an aircraft manufacturer, and had been a contract instructor for at least two training companies. He had been contract-instructing with the company he was with at the time of the accident since 2011. The information sheet indicated he was a gold-seal flight instructor,³ and had instructing experience in a wide variety of high performance single and multiengine airplanes.

5.0 The Pilot

According to the IIC, the accident pilot receiving flight instruction had the following flight times:

- Total time- 1,120 hours
- Multiengine time- 800 hours
- Time in type (BE-60)- 200 hours

³ According to the FAA, Flight instructor certificates with distinctive gold seals are issued to instructors who currently meet certain qualifications. These certificates are intended to identify those instructors who have high personal qualifications and good records as active flight instructors.

F. CONCLUSION

The accident instructor had a long history of flight instruction. Conversations with pilots he had flown with in the past, including two who had flown with him in October of 2016, did not reveal any concerns over his instructional abilities or piloting skills.

Despite this, according to accounts of the first day's flight the accident pilot provided to his friends, the instructor used techniques not in keeping with established flight training standards, nor with what would be expected from an individual with his extensive background in general aviation flight instruction. More critically, two of these techniques introduced unnecessary risk: Increasing power before reducing the AOA and rolling the wings level during a stall recovery, and, introducing asymmetric power while recovering from a stall in a multiengine airplane are both mistakes which can lead to an airplane entering a spin. As noted above, the FAA's Airplane Flying Handbook states, "No multiengine airplane is approved for spins, and their spin recovery characteristics are generally very poor." Additionally, the FAA Flight Instructor's Handbook (FAA-H-8083), states in part "NTSB statistics reveal that most stall/spin accidents occurred when the pilot's attention was diverted from the primary task of flying the aircraft. The purpose of stall training is to help the student learn how to recognize, prevent, and if necessary, recover before the stall develops into a spin." During stall recognition and recovery training, using techniques that fail to reduce the AOA first or that introduce asymmetric thrust, or a combination of both, could lead to a loss of airplane control. Both techniques, as well as a loss of aircraft control, were reported to have occurred the day before the accident.

Similar unnecessarily risky practices may have occurred on the accident flight. The witness descriptions of the accident were consistent with a slow flying airplane entering a stall followed by a spin. As on the previous flight, a spin could result from either of the stall recovery errors described above. Unlike the previous flight, the accident flight did not have sufficient altitude for recovery. Radar data for the accident flight showed it was operating between 1,000 and 1,200 feet AGL just prior to the accident. This was below the safe altitude required for stall training (one which allows recovery no lower than 3,000 feet AGL), and another example of a non-standard practice by the instructor.

G. LIST OF ATTACHMENTS

Attachment 1: Records of Conversations

Attachment 2: Information from Pilot's Friends

Submitted by

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