National Transportation Safety Board
Aviation Accident Final Report

Location:	Duette, FL	**Accident Number:**	ERA17FA119
Date & Time:	03/04/2017, 1330 EST	**Registration:**	N39AG
Aircraft:	BEECH B 60	**Aircraft Damage:**	Destroyed
Defining Event:	Aerodynamic stall/spin	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Instructional		

Analysis

The private pilot, who had recently purchased the airplane, and the flight instructor were conducting an instructional flight in the multi-engine airplane to meet insurance requirements. Radar data for the accident flight, which occurred on the second day of 2 days of training, showed the airplane maneuvering between 1,000 ft and 1,200 ft above ground level (agl) just before the accident. The witness descriptions of the accident were consistent with the airplane transitioning from slow flight into a stall that developed into a spin from which the pilots were unable to recover before the airplane impacted terrain. Examination of the wreckage did not reveal evidence of any preexisting mechanical malfunctions or anomalies that would have precluded normal operation of the airplane.

After the first day of training, the pilot told friends and fellow pilots that the instructor provided non-standard training that included stall practice that required emergency recoveries at low airspeed and low altitude. The instructor used techniques that were not in keeping with established flight training standards and were not what would be expected from an individual with his extensive background in general aviation flight instruction. Most critically, the instructor used two techniques that introduced unnecessary risk: increasing power before reducing the angle of attack during a stall recovery and introducing asymmetric power while recovering from a stall in a multi-engine airplane; both techniques are dangerous errors because they can lead to an airplane entering a spin. At one point during the first day of training, the airplane entered a full stall and spun before control was regained at very low altitude. The procedures performed contradicted standard practice and Federal Aviation Administration guidance; yet, despite the pilot's experience in multi-engine airplanes and in the accident airplane make and model, he chose to continue the second day of training with the instructor instead of seeking a replacement to complete the insurance check out.

The spin encountered on the accident flight likely resulted from the stall recovery errors advocated by the instructor and practiced on the prior day's flight. Unlike the previous flight, the accident flight did not have sufficient altitude for recovery because of the low altitude it was

operating at, which was below the safe altitude required for stall training (one which allows recovery no lower than 3,000 ft agl).

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilots' decision to perform flight training maneuvers at low airspeed at an altitude that was insufficient for stall recovery. Contributing to the accident was the flight instructor's inappropriate use of non-standard stall recovery techniques.

Findings

Aircraft	
	Airspeed - Not attained/maintained (Cause)
Personnel issues	Decision making/judgment - Pilot (Cause)
	Decision making/judgment - Instructor/check pilot (Cause)
	Aircraft control - Pilot (Cause)
	Aircraft control - Instructor/check pilot (Cause)
	Use of policy/procedure - Instructor/check pilot (Factor)
	Incorrect action performance - Instructor/check pilot (Factor)

Factual Information

History of Flight

Maneuvering-low-alt flying	Aerodynamic stall/spin (Defining event)

On March 4, 2017, about 1330 eastern standard time, a Beech B-60, N39AG, was destroyed by impact and a postcrash fire following an uncontrolled descent in Duette, Florida. The private pilot and the flight instructor were fatally injured. The airplane was owned by the pilot and operated by him under the provisions of Title 14 *Code of Federal Regulations (CFR)* Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the instructional flight that departed from Sarasota-Bradenton International Airport (SRQ) about 1240.

According to friends and representatives of the pilot's family, the pilot had recently purchased the airplane, and the purpose of the flight was to complete the second of 2 days of ground and flight training in the airplane to meet insurance requirements.

According to air traffic control (ATC) voice and radar data obtained from the Federal Aviation Administration (FAA), about 10 minutes after departure from SRQ, the pilot cancelled flight following services with ATC. For about the next 30 minutes, radar data depicted an overlapping track of left and right 360° and figure-eight turns consistent with airwork performed during a training flight. The track was over a rural area northeast of SRQ and in the immediate vicinity of the accident site. Radar data from the last 30 seconds of the flight depicted the airplane travelling northwest about 1,000 ft above ground level at 104 knots groundspeed.

A family, whose farm was less than 1 mile from the accident site, witnessed the accident from their property. These witnesses were familiar with airplanes and their engine sounds, and airplanes frequently flew and maneuvered over their property. The witnesses said their attention was drawn to the airplane by its sound. The airplane sounded loud as if it was at "low" altitude, but the engine sound was smooth. They went outside and watched the airplane's flight and its subsequent descent.

With a model of an airplane in his hand, one witness demonstrated an airplane in straight and level flight, going "kind of slow," as the nose gradually pitched up. He then demonstrated the airplane suddenly banking to one side and entering a spiraling descent. He said that the engine sound was smooth, continuous, and increased throughout the airplane's descent, until the airplane disappeared from his view and he heard the sounds of impact. The witness added that, as the airplane disappeared behind the trees and out of view, he "heard him give it gas" and described an engine sound increasing to very high rpm.

Two other members of the family provided nearly identical statements. A fourth family member, who was an engine mechanic, said he heard the airplane but did not see it, and the engine sounds were smooth and continuous throughout.

A group of motorcyclists were travelling on the state highway adjacent to the crash site when their attention was drawn to the airplane. They could not hear it over the sound of their motorcycles but watched as the airplane departed straight and level flight in a near vertical, spiraling descent.

Pilot Information

Certificate:	Private	**Age:**	58, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With Waivers/Limitations	**Last FAA Medical Exam:**	04/04/2016
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1120 hours (Total, all aircraft), 200 hours (Total, this make and model)		

Flight Instructor Information

Certificate:	Flight Instructor; Commercial	**Age:**	90, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Glider	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With Waivers/Limitations	**Last FAA Medical Exam:**	10/06/2014
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	20900 hours (Total, all aircraft), 165 hours (Total, this make and model)		

According to FAA records, the pilot held a private pilot certificate with ratings for airplane single- and multi-engine land. He did not possess an instrument rating. The pilot's most recent FAA second-class medical certificate was issued on April 4, 2016.

On an insurance application form dated January 30, 2017, the pilot declared 1,120 total hours of flight experience. He reported 800 total hours of multi-engine flight experience of which 200 hours were in the accident airplane make and model.

The flight instructor held a commercial pilot certificate with ratings for airplane single- and multi-engine land and instrument airplane. He held a flight instructor certificate with ratings

for single-engine, multi-engine, and instrument airplane. His most recent FAA second-class medical certificate was issued October 6, 2014.

According to the flight instructor's company profile, he had accrued 20,900 total hours of flight experience of which 165 hours were in the accident airplane make and model.

The flight instructor had been the owner of a flight school, a chief pilot and an 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 a contract instructor for at least two training companies. He had been contract-instructing for the company he was with at the time of the accident since 2011. The information sheet provided by the company indicated that he was a gold-seal flight instructor and had instructing experience in a wide variety of high-performance single- and multi-engine airplanes.

Aircraft and Owner/Operator Information

Aircraft Make:	BEECH	**Registration:**	N39AG
Model/Series:	B 60 NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:	1977	**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	P-425
Landing Gear Type:	Tricycle	**Seats:**	
Date/Type of Last Inspection:	03/02/2017, Annual	**Certified Max Gross Wt.:**	6781 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	3271.6 Hours as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	TIO-541-E1C4
Registered Owner:	On file	**Rated Power:**	380 hp
Operator:	On file	**Operating Certificate(s) Held:**	None

The six-seat, twin-engine, low-wing, retractable-gear airplane was manufactured in 1977 and was equipped with two Lycoming 380-horsepower reciprocating engines. According to the airplane's maintenance records, the most recent annual inspection was completed on March 2, 2017, at 3,271.6 total aircraft hours.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	LAL, 142 ft msl	**Distance from Accident Site:**	23 Nautical Miles
Observation Time:	1350 EST	**Direction from Accident Site:**	5°
Lowest Cloud Condition:	Clear	**Visibility**	10 Miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots / 20 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	60°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.39 inches Hg	**Temperature/Dew Point:**	24°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	SARASOTA/BRADENTON, FL (SRQ)	**Type of Flight Plan Filed:**	None
Destination:	SARASOTA/BRADENTON, FL (SRQ)	**Type of Clearance:**	None
Departure Time:	1240 EST	**Type of Airspace:**	

The 1350 automated weather observation at Lakeland Regional Airport (LAL), located 23 nautical miles north of the accident site, included clear skies, 10 statute miles visibility, and wind from 005° at 10 knots gusting to 20 knots. The temperature was 24°C, the dew point was 8°C, and the altimeter setting was 30.39 inches of mercury.

Airport Information

Airport:	SARASOTA/BRADENTON INTL (SRQ)	**Runway Surface Type:**	N/A
Airport Elevation:	29 ft	**Runway Surface Condition:**	Dry; Vegetation
Runway Used:	N/A	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	27.613889, -82.084444 (est)

The wreckage was examined at the accident site, and all major components were accounted for at the scene. Angularly-cut tree branches were observed in the trees above the wreckage and scattered on the ground. The airplane came to rest immediately adjacent to three craters that were each about 3 ft deep. The craters were spaced at a distance consistent with the nose and both engines of the airplane. The postimpact fire consumed a majority of the airplane, including the cockpit instruments and switches. Flight control cable continuity was confirmed from the flight controls to the cockpit area. The flaps and landing gear were retracted. The trim actuators were within normal operating range.

The fuel selector handle panel in the cockpit was separated from its mounting structure. The left fuel selector handle was near the "ON" position. The left fuel selector valve cable was pulled out of the valve, and the valve was in a non-operating position. The right fuel selector was in the "ON" position.

Both engines were partially separated from the airframe. The three propeller blades from each engine were found separated from their respective hubs in the impact craters. One of the left propeller blades exhibited a large impact to its leading edge, and all blades exhibited similar bending and cambered side polishing.

Engine Examinations

The engines were examined at a recovery facility in Jacksonville, Florida. Both engines displayed significant impact and fire damage, and neither could be rotated by hand. The engine accessories were destroyed by impact and fire damage and could not be tested. The fuel servo of each engine contained a small amount of fuel. Both engine oil sumps were consumed by fire.

The compressor housings of both turbochargers displayed radial scuff marks adjacent to their respective impellers. The nose of each engine starter displayed rotational scoring adjacent to the engine crankshaft starter gear.

Visual inspection of the engine drive trains, valve trains, and individual cylinders revealed signatures consistent with normal wear and lubrication.

Medical And Pathological Information

The District Twelve Medical Examiner, Sarasota, Florida, performed autopsies on the pilot and the flight instructor. The cause of death determined for both was blunt impact injuries.

The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing on the pilot and the flight instructor. The pilot's results were negative for all tested-for substances. The flight instructor's results were positive for alcohol that was consistent with postmortem production and not from consumption.

Additional Information

Operational Factors

The pilot's insurance company required the pilot to perform biennial ground and flight training, and, because the airplane was a recent purchase, he contracted training through Access Flight Training Services, LLC, Willoughby, Ohio.

According to the president of Access Flight Training Services, the company maintained a directory of flight instructors and the airplanes in which they specialized. The instructor on the accident flight was an "independent contractor" for the company. The instructors maintained their currency and qualifications "independently" and were not trained or evaluated by Access Flight Training. Access Flight Training did not provide flight training manuals. The standards used and taught by their instructors were from the FAA Practical Test Standards or the specific aircraft flight manual, "whichever is more restrictive."

After receiving flight training from the flight instructor on the day before the accident, the pilot called a friend who was not a pilot but had 100 to 200 hours of flight experience as a passenger in the right seat of a light, twin-engine airplane. The friend had also flown on many occasions with the accident pilot and considered him an excellent pilot. After their conversation, the friend felt that the pilot had been through a stressful day. The friend stated that the pilot mentioned two specific items that he felt were unsafe.

One item was that the instructor had the pilot land on runways that were not the best choice based on wind direction and that the instructor purposely selected crosswind runways, which amplified the difficulty of landing. The second item was an action the instructor took during recovery from a practice 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 airplane had entered "a spin." After losing 1,000 ft, full control of the airplane was achieved at an altitude of 2,000 ft. Both the pilot and the instructor were surprised and frightened by this event, and they landed soon afterward.

Another friend, who was an airline transport pilot and a multi-engine flight instructor, also had a conversation with the accident pilot on the evening before the accident. The pilot expressed concern about the instructor's non-standard practice of not advancing the propeller controller or fuel mixture control before landing. The pilot also told his friend that the instructor was advocating a non-standard stall recovery method. The instructor told the pilot to first add power, then lower the nose and level the wings. This was contrary to what the pilot had been

taught, 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. The airplane completed one and a half turns before they recovered. When the pilot expressed concern to the instructor 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 before 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 that 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 ft and did not recover until reaching 1,800 ft. The instructor stated that he did not expect the airplane to do that.

Standard Procedures for Flight Training

Regarding stall and stall recovery practice in multi-engine airplanes, the FAA's Airplane Flying Handbook, Chapter 12, Transition to Multiengine Airplanes, stated, in part, the following: "...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 [airframe flight manual/pilot operating handbook] 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 Vmc demonstrations, stall practice, slow flight, or any condition of high asymmetrical thrust, particularly at low speed/high AOA. Single-engine stalls are not part of any multiengine training curriculum."

Regarding stalls in multi-engine airplanes, the FAA's Flight Instructor Airplane Practical Test Standards, FAA-S-8081-6D, which establishes the standards for the flight instructor

certification practical test, stated, in part, that "stalls must not be performed with one engine at reduced power or inoperative and the other engine developing effective power."

The FAA's Private Pilot-Airplane Airmen Certification Standards, FAA-S-ACS-6A, lists the skills required for demonstrating slow flight and stalls in multi-engine airplanes, including, "select an entry altitude that will allow the task to be completed no lower than 3,000 feet AGL."

Preventing Similar Accidents

Pilots: Manage Risks to Ensure Safety

Although few pilots knowingly accept severe risks, accidents can also result when several risks of marginal severity are not identified or are ineffectively managed by the pilot and compound into a dangerous situation. Accidents also result when the pilot does not accurately perceive situations that involve high levels of risk. Ineffective risk management or poor aeronautical decision-making can be associated with almost any type of fatal general aviation accident.

By identifying personal attitudes that are hazardous to safe flying, applying behavior modification techniques, recognizing and coping with stress, and effectively using all resources, pilots can substantially improve the safety of each flight. Remember that effective risk management takes practice. It is a decision-making process by which pilots can systematically identify hazards, assess the degree of risk, and determine the best course of action. Pilots should plan ahead with flight diversion or cancellation alternatives, and they not be afraid to change their plans; it can sometimes be the difference between arriving safely late or not arriving at all.

See http://www.ntsb.gov/safety/safety-alerts/documents/SA_023.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Brian C Rayner	**Adopted Date:**	05/09/2018
Additional Participating Persons:	Timothy Annis; FAA/FSDO; Tampa, FL James M Childers; Lycoming; Williamsport, PA Henry Soderlund; Textron; Wichita, KS		
Publish Date:	05/09/2018		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=94809		

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report.