Aviation Investigation Final Report

Location:	Winter Haven, Florida	**Accident Number:**	ERA19FA106
Date & Time:	February 23, 2019, 12:43 Local	**Registration:**	N65NE
Aircraft:	STOL Aircraft Corp UC-1	**Aircraft Damage:**	Substantial
Defining Event:	Powerplant sys/comp malf/fail	**Injuries:**	1 Fatal, 1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The pilot and flight instructor were conducting an instructional flight in the amphibious multi-engine airplane. The instructor briefed the pilot before the flight that he would simulate an engine failure at some point after takeoff. The pilot stated that, after takeoff, about 200 to 300 ft above ground level, the instructor reduced power on the left engine, and the engine subsequently lost all power.

The flight instructor took control of the airplane and unsuccessfully attempted to restart the engine as the airplane continued to descend. The pilot stated that he was in the process of retracting the landing gear and did not have enough time to retract the flaps. The instructor was unable to establish a climb and upon realizing that the airplane would not reach the selected forced landing site, the instructor selected a closer landing site; however, as he turned the airplane left toward the site, the airplane likely slowed below its single-engine minimum control airspeed, the left wing dropped, and the airplane impacted a house. Examination of the wreckage revealed that the left propeller was in the feather position. There was no evidence of any preexisting mechanical malfunctions or anomalies that would have precluded normal operation of the airplane, and the left engine performed with no anomalies during a test run; therefore, the reason for the total loss of left engine power could not be determined.

The instructor's decision to simulate a failure of the airplane's critical engine at low altitude allowed little margin for securing the failed engine and configuring the airplane for optimum single-engine performance following the actual loss of engine power. His subsequent failure to maintain airspeed while maneuvering for a forced landing resulted in a loss of control.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A total loss of left engine power for reasons that could not be determined, and the instructor's failure to maintain airspeed while maneuvering for a forced landing, which resulted in a loss of

control. Contributing to the accident was the instructor's decision to conduct a simulated engine failure at low altitude.

Findings

Aircraft	(general) - Simulated malf/failure
Not determined	(general) - Unknown/Not determined
Aircraft	Airspeed - Not attained/maintained
Personnel issues	Aircraft control - Instructor/check pilot
Personnel issues	Decision making/judgment - Instructor/check pilot
Aircraft	Altitude - Incorrect use/operation

Factual Information

History of Flight

Initial climb	Simulated/training event
Initial climb	Powerplant sys/comp malf/fail (Defining event)
Initial climb	Loss of control in flight
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On February 23, 2019, about 1243 eastern standard time, a STOL Aircraft Corp UC-1 amphibious airplane, N65NE, was substantially damaged when it was involved in an accident in Winter Haven, Florida. The flight instructor was fatally injured, the commercial pilot sustained minor injuries, and one person on the ground was seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The pilot receiving instruction, was receiving initial multiengine-sea training from the flight instructor in the accident airplane. The pilot stated that the instructor advised him before takeoff that he would introduce a simulated engine failure at some point during the takeoff or climb. Shortly after takeoff, about 200 to 300 ft above ground level (agl), the instructor reduced the throttle on the left engine, and the left engine subsequently lost all power. The pilot stated that he and the instructor identified the failed engine and the instructor took control of the airplane and selected a forced landing site. The pilot stated they were unable to get "any single engine climb performance," he was in the process of retracting the landing gear and did not have time to retract the flaps.

During the descent, the instructor unsuccessfully attempted to restart the engine before determining that the airplane would not reach the selected forced landing site. The instructor then chose a lake to the airplane's left as an alternate site. The pilot stated that during the left descending turn, the airplane slowed to Vmc (minimum control speed with one engine inoperative), the left wing dropped, and the airplane impacted a house, seriously injuring one of its occupants.

A witness in a fuel truck at the departure airport stated that she watched the airplane fly overhead. She saw both propellers rotating and watched as the left propeller stopped rotating. The witness said she then watched as the airplane "sank" in a descending left turn until it disappeared from view.

Flight instructor Information

Certificate:	Airline transport; Flight instructor	**Age:**	64,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land; Multi-engine sea	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	January 25, 2019
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 15000 hours (Total, all aircraft)		

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	33,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	October 24, 2017
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 820 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	STOL Aircraft Corp	**Registration:**	N65NE
Model/Series:	UC-1	**Aircraft Category:**	Airplane
Year of Manufacture:	1986	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	023
Landing Gear Type:	Retractable - Tailwheel	**Seats:**	5
Date/Type of Last Inspection:	February 23, 2019 100 hour	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-360
Registered Owner:		**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

On January 23, 2019, 1 month before the accident, the engine total time since major overhaul was 2,113.9 hours. A Lycoming Service Instruction stated that the time between overhaul for the engine model was 2,000 hours.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KGIF,146 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	11:53 Local	**Direction from Accident Site:**	354°
Lowest Cloud Condition:	Few / 3400 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / 17 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.14 inches Hg	**Temperature/Dew Point:**	29°C / 20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Winter Haven, FL (GIF)	**Type of Flight Plan Filed:**	None
Destination:	Winter Haven, FL (GIF)	**Type of Clearance:**	None
Departure Time:	12:39 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Winter Haven'S Gilbert GIF	**Runway Surface Type:**	Asphalt
Airport Elevation:	145 ft msl	**Runway Surface Condition:**	
Runway Used:	23	**IFR Approach:**	None
Runway Length/Width:	5006 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal, 1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	1 Serious	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious, 1 Minor	**Latitude, Longitude:**	28.05611,-81.753334

The airplane came to rest inside a house in a near-vertical, nose-down attitude. All major components were accounted for at the scene. The cockpit area was destroyed and crushed inward. The top of the fuselage between the engines was crushed inward. The fuselage beyond the fifth seat was intact and undamaged. The throttle quadrant, which ran along the top of the cockpit, was separated during the impact sequence. The wings remained attached and were removed for recovery. The flaps were found in the takeoff position. After recovery of the airplane, control continuity was traced from the cockpit through several cable breaks to all flight control surfaces.

The right wing leading edge inboard of the engine was crushed inward. The front and inboard side of the cowling was crushed. The right engine propeller blades displayed chordwise scratching and tip curling. The right wing outboard of the engine was undamaged. The left wing leading edge inboard of the engine was crushed. The left propeller blades were feathered and undamaged. The outboard portion of the left wing displayed wrinkled skin and upward folding of the wing and skin. The wingtip was crushed inward.

Both engines were rotated by hand at their propeller hub, and continuity was confirmed through the powertrain to the valve train and accessory section. Compression was confirmed on all cylinders of both engines. All of the ignition harness leads were intact and undamaged. The right engine's magnetos were manually rotated and produced spark at all terminal leads.

A test run of the left engine was attempted. An external battery and engine controls were connected, and an external fuel tank was plumbed directly to the fuel pump inlet. The engine started immediately, accelerated smoothly, and ran continuously at all selected power settings without interruption.

No evidence of preimpact mechanical malfunction was noted during the examination of the recovered airframe and engines.

Additional Information

FAA pamphlet FAA-P-8740-66, Flying Light Twins Safely, defines the critical engine as the engine whose failure would most adversely affect the airplane's performance or handling qualities. On twin-engine airplanes with both engines turning in a conventional, clockwise rotation (viewed from the cockpit), the left engine is critical.

Vmc is defined as the minimum flight speed at which the aircraft is directionally controllable with a bank of no more than 5° when the critical engine is inoperative (windmilling) and the remaining engine is operating at takeoff power.

Regarding one engine inoperative (OEI) climb performance and simulated engine failures, the pamphlet states:

…the light twin with OEI will perform marginally at best and may not be capable of climbing at all under existing conditions. There is no requirement that a light twin in the takeoff or landing configuration must be able to maintain altitude, even at sea level, with OEI.

Low altitude engine failure is never worth the risks involved. Multiengine instructors should approach simulated engine failures below 400 feet agl with extreme caution, and failures below 200 ft agl should be reserved for simulators and training devices.

Medical and Pathological Information

The autopsy of the flight instructor was performed by the Polk County Medical Examiner, Winter Haven, Florida. The cause of death was blunt impact injuries.

Toxicology testing performed at the FAA Forensic Sciences Laboratory was negative for carbon monoxide and ethanol. Amlodipine, a prescription blood pressure medication that is not considered impairing, was identified.

Administrative Information

Investigator In Charge (IIC):	Hill, Millicent
Additional Participating Persons:	Joe Gramzinski; FAA/FSDO; Orlando, FL Mike Childers; Lycoming Engines; Williamsport, PA
Original Publish Date:	December 3, 2020 **Investigation Class:** 2
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99011