National Transportation Safety Board
Aviation Accident Final Report

Location:	East Haven, CT	**Accident Number:**	ERA13FA358
Date & Time:	08/09/2013, 1121 EDT	**Registration:**	N13622
Aircraft:	ROCKWELL INTERNATIONAL 690B	**Aircraft Damage:**	Destroyed
Defining Event:	Aerodynamic stall/spin	**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot was attempting a circling approach with a strong gusty tailwind. Radar data and an air traffic controller confirmed that the airplane was circling at or below the minimum descent altitude of 720 feet (708 feet above ground level [agl]) while flying in and out of an overcast ceiling that was varying between 600 feet and 1,100 feet agl. The airplane was flying at 100 knots and was close to the runway threshold on the left downwind leg of the airport traffic pattern, which would have required a 180-degree turn with a 45-degree or greater bank to align with the runway. Assuming a consistent bank of 45 degrees, and a stall speed of 88 to 94 knots, the airplane would have been near stall during that bank. If the bank was increased due to the tailwind, the stall speed would have increased above 100 knots. Additionally, witnesses saw the airplane descend out of the clouds in a nose-down attitude. Thus, it was likely the pilot encountered an aerodynamic stall as he was banking sharply, while flying in and out of clouds, trying to align the airplane with the runway.

Toxicological testing revealed the presence of zolpidem, which is a sleep aid marketed under the brand name Ambien; however, the levels were well below the therapeutic range and consistent with the pilot taking the medication the evening before the accident. Therefore, the pilot was not impaired due to the zolpidem. Examination of the wreckage did not reveal any preimpact mechanical malfunctions.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain airspeed while banking aggressively in and out of clouds for landing in gusty tailwind conditions, which resulted in an aerodynamic stall and uncontrolled descent.

Findings

Aircraft	Airspeed - Not attained/maintained (Cause)
Personnel issues	Aircraft control - Pilot (Cause)
Environmental issues	Tailwind - Effect on operation Gusts - Effect on operation High wind - Effect on operation Residence/building - Contributed to outcome

Factual Information

HISTORY OF FLIGHT

On August 9, 2013, about 1121 eastern daylight time, a Rockwell International 690B, N13622, was destroyed after impacting two homes while maneuvering for landing in East Haven, Connecticut. The airplane was registered to Ellumax, LLC, and was operated by a private individual. The commercial pilot, one passenger, and two people on the ground were fatally injured. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Instrument meteorological conditions prevailed and an instrument flight rules (IFR) flight plan was filed for the flight that departed Teterboro Airport (TEB), Teterboro, New Jersey, about 1049 and was destined for Tweed-New Haven Airport (HVN), New Haven, Connecticut.

Review of data from the Federal Aviation Administration (FAA) revealed that at 1104, the pilot was advised by a New York Approach controller to expect an instrument landing system (ILS) approach to runway 2, with a circle to land runway 20 at HVN, which he acknowledged. At 1115, the flight was cleared for that approach and the pilot was instructed to contact the HVN tower, which he did. At 1116, the pilot reported to the tower controller that the airplane was 7.5 miles from the final approach fix and the controller instructed the pilot to report a left downwind leg of the traffic pattern for runway 20. The pilot then asked if anybody had landed straight in and the controller replied no, the winds were 190 degrees at 17 knots, which the pilot acknowledged. At 1119 the pilot reported that the airplane was on a left downwind and the controller cleared the flight to land.

At 1120:42, the controller stated, "November one two two are you going to be able to maintain visual contact with the airport?" The pilot replied "are you talking to six two two" and the controller replied "six two two affirmative." At 1520:51, the pilot replied, "six two two is in visual contact now." No further communications were received from the accident airplane. The last recorded radar target was at 1120:53, about .7 miles north of the runway 20 threshold indicating an altitude of 800 feet mean seal level.

After the accident, the HVN tower controller stated that he observed the airplane on a midfield left downwind leg of the airport traffic pattern for runway 20 and it was "skimming" the cloud bases. He asked the pilot if he could maintain visual contact with the runway and the pilot replied yes. The controller then lost visual contact with the airplane and about 2 to 3 seconds later, it re-appeared nose-down, rotating counter-clockwise and descending from the clouds to the ground. Several other witnesses near the accident site reported seeing the airplane descend in an unusual attitude and/or the sound of loud engine noise just before impact.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate, with ratings for airplane single-engine land, airplane multiengine land, and instrument airplane. His most recent FAA third-class medical certificate was issued on September 13, 2011. At that time, he reported a total flight experience of 1,952 hours.

Review of the pilot's logbook revealed that he had accumulated a total flight experience of approximately 2,067 hours; of which, about 1,407 hours were in multiengine airplanes and 574 hours of that were in turbine aircraft. The pilot had flown about 394 hours in actual instrument meteorological conditions. Additionally, the pilot completed a flight review and instrument

proficiency check on March 2 and March 18, 2013, respectively. The last entry in the pilot's logbook was dated March 19, 2013. There was no record of flight time between that date and the accident. A determination could not be made of how many circling approaches the pilot had performed in actual conditions.

AIRCRAFT INFORMATION

The 11-seat, high wing, retractable gear airplane, serial number 11469, was manufactured in 1978. It was powered by two Honeywell TPE331 engines, serial numbers P79297C, and P79001C respectively. According to FAA records, the airplane was issued a standard airworthiness certificate on March 8, 1982. Review of copies of maintenance logbook records revealed an annual inspection was completed February 13, 2013 at a recorded tachometer reading of 1250.1 hours, airframe total time of 8827.1 hours, and engine time since major overhaul of 1249.5 hours. The tachometer and the Hobbs hour-meter were not located at the accident site.

METEOROLOGICAL INFORMATION

The recorded weather at HVN, at 1126, was: wind from 170 degrees at 12 knots, gusting to 19 knots; visibility 9 miles in light rain, overcast ceiling at 900 feet; temperature 24 degrees C; dew point 23 degrees C; altimeter 29.88 inches Hg. Remarks: Rain began at 18 minutes after the hour, and the ceiling height was variable between 600 feet and 1,100 feet.

Prior to the accident flight, the pilot contacted flight service and received an abbreviated weather briefing for the accident flight. For more information, see Meteorology Factual Report in the public docket.

WRECKAGE AND IMPACT INFORMATION

The airplane was located inverted, with about one-half of the cockpit and fuselage inside a house and basement. The wreckage came to rest on a magnetic heading about 185 degrees. The total circumference of the wreckage debris field was approximately 90 feet. The distance and direction from the wreckage to the approach end of runway 20 at HVN was 180 degrees magnetic and about .6 mile.

The cockpit section rearward to the crew entrance door was separated from the fuselage, crushed, thermally damaged, and located inside the basement of the house. The instrument panel exhibited crushing and thermal damage. The cockpit windscreens were fragmented. The nose landing gear remained attached and in the down and locked position and corresponded with the landing gear selection handle on the instrument panel.

The right wing impacted an adjacent house and separated from the fuselage. The wing was destroyed by thermal damage, and came to rest against the adjacent house. The right main landing gear separated from the attachment point to the wing. The left wing impacted the ground and was separated from the fuselage. There was thermal damage the entire length of the wing. The wing was lying inverted in the back of the main wreckage. The left aileron was present and attached to two connecting rods. The flap had separated and the preimpact flap setting could not be determined. The left main landing gear remained attached to the wing, was thermal damaged, and in the extended position.

The left engine was detached from the wing and lying in the basement of the primary house. The engine exhibited crushing and thermal damage. The right engine was detached from the wing and lying in a 12-inch crater between both houses. The engine exhibited crushing and

thermal damage. A teardown examination of both engines was performed at the manufacturer facility under the supervision of an NTSB investigator. The examination did not reveal any preimpact mechanical malfunctions or anomalies that would have precluded normal operations.

The left propeller remained connected to the gearbox and exhibited thermal damage and chordwise scratching of all three propeller blades. The right propeller remained also connected to its gearbox. All three propeller blades exhibited s-bending and chordwise scratching. A detailed examination of both propellers did not reveal any preimpact mechanical malfunctions or anomalies that would have precluded normal operations.

About 12 feet of fuselage was resting on the ground in between both houses, connected to the empennage section, and exhibited thermal damage. The vertical and horizontal surfaces remained connected to their respective connecting rods, and also exhibited thermal damage. Control cable continuity was confirmed from the elevator and rudder to the cockpit area. Due to impact and thermal damage, aileron control cable continuity could not be confirmed.

An enhanced ground proximity warning system and cockpit display were recovered from the wreckage and forwarded to the NTSB Vehicle Recorder Laboratory, Washington, D.C.; however, due to thermal and impact damage, data could not be recovered from either unit.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on August 10, 2013, by the State of Connecticut Office of the Chief Medical Examiner, Farmington, Connecticut. Review of the autopsy report revealed that the cause of death was "blunt impact injuries of head, trunk, and extremities."

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma.

Review of the toxicology report revealed:

"0.029 (ug/ml, ug/g) Zolpidem detected in Liver

0.008 (ug/ml, ug/g) Zolpidem detected in Blood"

TESTS AND RESEARCH

Review of an approach chart for the instrument landing system approach to runway 2, circle to land runway 20, revealed that the minimum descent altitude was 720 feet.

Further review of radar data by an NTSB performance engineer revealed that during the circling approach, the airplane flew as close as 1,800 feet east of the approach end of runway 20 (abeam the numbers) on the downwind leg of the airport traffic pattern, which would require an approximate 180-degree turn within a radius of 900 feet to align with the runway. At the last airspeed approximation from the radar trajectory of 100 knots, the airplane would have had to bank about 45 degrees to complete the turn (assuming a consistent bank throughout the turn and not accounting for the tailwind); however, the airplane's stall speed at that bank would increase to 88 knots in the landing configuration or 94 knots with flaps retracted. The stall speed would increase beyond 100 knots as the bank increased beyond 45 degrees.

Additionally, at that time, the airplane was at 600 feet and the controller queried the pilot if he could maintain visual contact with the runway. The airplane then climbed to 800 feet into the

clouds, before reappearing in a nose-down descent.

For more information, see Aircraft Performance Study in the public docket.

History of Flight

Approach-circling (IFR)	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Commercial	**Age:**	54
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With Waivers/Limitations	**Last FAA Medical Exam:**	09/13/2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	03/18/2013
Flight Time:	2067 hours (Total, all aircraft), 999999 hours (Total, this make and model), 1958 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	ROCKWELL INTERNATIONAL	**Registration:**	N13622
Model/Series:	690B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	11469
Landing Gear Type:	Retractable - Tricycle	**Seats:**	8
Date/Type of Last Inspection:	02/11/2013, Annual	**Certified Max Gross Wt.:**	10325 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo Prop
Airframe Total Time:	8827 Hours as of last inspection	**Engine Manufacturer:**	Honeywell
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	TPE331-5-251K
Registered Owner:	ELLUMAX LEASING LLC	**Rated Power:**	575 hp
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	HVN, 12 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	1126 EDT	**Direction from Accident Site:**	200°
Lowest Cloud Condition:		**Visibility**	9 Miles
Lowest Ceiling:	Overcast / 900 ft agl	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / 19 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.88 inches Hg	**Temperature/Dew Point:**	24°C / 23°C
Precipitation and Obscuration:	Light - Rain; No Obscuration		
Departure Point:	Teterboro, NJ (TEB)	**Type of Flight Plan Filed:**	IFR
Destination:	East Haven, CT (HVN)	**Type of Clearance:**	IFR
Departure Time:	1049 EDT	**Type of Airspace:**	

Airport Information

Airport:	Tweed-New Haven Airport (HVN)	**Runway Surface Type:**	Asphalt
Airport Elevation:	12 ft	**Runway Surface Condition:**	Wet
Runway Used:	20	**IFR Approach:**	Circling; ILS
Runway Length/Width:	5600 ft / 150 ft	**VFR Approach/Landing:**	Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-Ground
Ground Injuries:	2 Fatal	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	41.274444, -72.884722

Administrative Information

Investigator In Charge (IIC):	Patrick M Murray	**Report Date:**	10/27/2014
Additional Participating Persons:	Robert Hendrickson; FAA/AVP-100; Washington, DC Daniel Boggs; Hartzell; Piqua, OH David Studtmann; Honeywell; Phoenix, AZ		
Publish Date:	12/17/2014		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=87718		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

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. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available here.