Aviation Investigation Final Report

Location:	Waxhaw, North Carolina	**Accident Number:**	MIA08FA081
Date & Time:	March 20, 2008, 16:00 Local	**Registration:**	N615WM
Aircraft:	Cirrus SR22	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot announced over the common traffic advisory frequency his intention to land. The airplane approached the airport from the south at an altitude of approximately 800 feet, crossed the airport near mid-field, entered the traffic pattern for a left downwind to runway 6, and then crashed during the turn from left base to final. Winds were 310 degrees at 11 knots, gusting to 20 knots. This combination of wind direction and speed created a situation where grounds speed was higher than airspeed for the turn from base leg to final. The higher ground speed would have required a larger turning radius than normal, or an increased angle of bank than if the winds were calm. (Higher bank angles increase the probability of an airplane entering an aerodynamic stall.) Examination of the wreckage did not reveal any evidence of preimpact mechanical anomalies. Data extracted from the onboard global positioning system revealed that the airplane's last altitude was 838 feet; vertical speed was down -444 feet per minute, indicated airspeed was 60.3 knots, with a pitch attitude of up 4.98 degrees and a left roll of -31.73 degrees. These parameters indicate the airplane had or was about to enter the early phase of an aerodynamic stall.

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 adequate airspeed while maneuvering to land, resulting in an aerodynamic stall. Contributing to the accident was the tailwind.

Findings

Aircraft	Airspeed - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Environmental issues	Tailwind - Not specified

Factual Information

History of Flight

Approach-VFR pattern final	Aerodynamic stall/spin (Defining event)

HISTORY OF FLIGHT

On March 20, 2008, about 1600 eastern daylight time, a Cirrus Design SR22, N615WM, registered to Manning Companies LLC, crashed into trees while turning base to final approach to runway 6 at the Aero Plantation Airport (NC21), near Waxhaw, North Carolina. The certificated private pilot was killed, and the airplane sustained substantial damage. The flight was operated as a personal flight under the provisions of 14 Code of Federal Regulations (CFR) Part 91, and no flight plan was filed. Visual meteorological conditions (VMC) prevailed at the time of the accident. The flight departed from Pilot's Ridge Airport (03NC), Carolina Beach, North Carolina, on March 20, 2008, about 1515.

According to one witness, the pilot announced his intentions to land over the common traffic advisory frequency. The airplane approached from the south at an altitude of approximately 800 feet, crossed the airport near mid-field, and then entered the traffic pattern for a left downwind to runway 6. When the witness contacted, the pilot by a handheld radio the pilot responded "I'm turning base." Within a few moments, the witness heard the airplane impact the ground.

According to one area resident, who is based at NC21, "it's a tricky airport." Runway 24 slopes up and runway 6 slopes down. The area resident stated that runway 6/24 is 2,400 feet long and 40 feet wide with a "big hump" in the middle. He also said its "recommended left traffic," because the surrounding terrain favors landing on runway 24, and takeoffs on runway 6.

PERSONNEL INFORMATION

The pilot, age 51, held a private pilot certificate with ratings for airplane single-engine land, updated on March 23, 2000. He also held a third-class medical certificate, issued on November 16, 2007, with the restriction that he must possess lenses that correct for near vision.

A review of the pilot's logbook, which included dated entries from March 6, 1997, through March 11, 2008, the pilot had logged a total flight time of approximately 604.3 hours, of which; 604.3 hours was logged as airplane single-engine land flight; 313.8 hours as dual flight, (although all logged "dual flight" entries did not include a flight instructor's signature); 2.3 hours as night flight; 22.4 hours as actual instrument flight; and 5.7 hours as simulated instrument flight. The pilot had logged approximately 25.8 hours of flight time in the past 90-days, 11.6 hours in the past 30-days, and 0.0 hours in the past 24 hours. On July 1, 2006, the

pilot completed a Certified Flight Training Course after logging 10.6 hours of flight time in a Cirrus SR22. The pilot logged approximately 142.8 hours in a Cirrus SR20, and approximately 248.4 hours in a Cirrus SR22.

AIRCRAFT INFORMATION

The four-seat, low-wing, fixed-gear airplane was manufactured in 2006. It was powered by a Teledyne Continental Motors IO-550-N, 310-horsepower engine, and equipped with a Hartzell model PHC-J3YF-IR, constant-speed propeller.

A review of the airplane's logbooks found that the airplane's last annual inspection was performed on June 11, 2007. According to the inspection write-up, the Hobbs meter time for both the engine and airframe was 300.2 hours. The Hobbs meter time observed at the accident site was 501.0 hours.

METEOROLOGICAL INFORMATION

The nearest weather reporting station was located at Monroe Regional Airport (EQY), Monroe, North Carolina, located approximately 6.5 nautical miles at 076 degrees, was: wind, 310 degrees at 11 knots, gusting to 20 knots; visibility, 10 statute miles; sky, clear; temperature, 16 degrees Celsius, dew point -3 degrees Celsius; altimeter setting 30.07 inches of mercury. Remarks: Peak wind at 1516 was 330 degrees at 27 knots.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located approximately 2,000 feet short of the approach end of Aero Plantation Airport's runway 6, in a wooded area behind a residence. Broken tree branches were noted at the top of a 70-foot tall tree in the back yard of the residence. Additional broken tree branches were noted along the debris path leading to the main wreckage. The debris path was orientated on a heading of approximately 035 degrees.

The main wreckage was located at the base of a 15-inch diameter oak tree, about 120 feet from the initial tree strike, at 34 degrees, 59.18 minutes North Latitude, 080 degrees, 45.46 minutes West Longitude. No ground scars were noted prior to the main impact point. All flight control surfaces, engine, propeller, and the Cirrus Airplane Parachute System (CAPS) components were located at the site.

Wreckage debris was noted along the debris path between the initial tree strike and the main wreckage. The debris along the energy path included the left and right wing tip fairings, portions of the left and right wing skins, the pitot tube and the right aileron. Propeller cuts were noted in several severed tree branches.

The wreckage debris field extended an additional 50 feet beyond the main wreckage. The wreckage in the extended debris field included the upper engine cowling, pieces of the

windshield, a portion of the right cabin door and several small pieces of broken fiberglass.

The CAPS was found deployed and the CAPS rocket motor propellant was expended. The CAPS rocket motor, rocket lanyards, incremental bridal, deployment bag (D-Bag), suspension lines and riser, had been extracted from the CAPS enclosure compartment. The packed Parachute Assembly remained in the D-Bag. All but two loops of the packed suspension lines were extracted from the D-Bag. The riser was extracted from the D-Bag. The CAPS rocket motor was found entangled in tree branches, approximately 25 feet above the ground, at a point approximately 35 feet behind the main wreckage. The CAPS enclosure cover was located about 104 feet, on a heading of 120 degrees, from the main wreckage.

The wing exhibited impact damage. The wing spar was fractured in multiple places and was buckled around the base of the tree about 45 to 50 degrees. The left and right fuel tanks were compromised. The left and right flaps remained attached to the wing. The left and right ailerons were separated from the wing. The roll trim motor was located in full left trim position. The flap actuator shaft was extended approximately 4 inches, consistent with a "Flaps-Up" position. Left aileron control cable continuity was confirmed from the crossover cable turnbuckle to the left hand aileron actuator pulley to the left kick out pulley, to the forward pulley gang. The right aileron control cable continuity was confirmed from the forward pulley gang to the right kick out pulley, to the right hand aileron actuator pulley to a fracture noted in the cable just inboard of the wing root. The fracture in the cable exhibited a "broom straw" signature.

The rudder remained attached to the vertical stabilizer. The rudder attachment hardware and safeties were present at all three attachment points. Rudder control cable continuity was confirmed from the "yellow" rudder cable turnbuckle, to the rudder bellcrank at the fuselage station 306 bulkhead, to the "blue" rudder cable turnbuckle. The elevator remained attached to the horizontal stabilizer. The elevator attachment hardware and safeties were present. Elevator control cable continuity was confirmed from the "red" elevator cable turnbuckle, to the elevator bellcrank at the fuselage station 306 bulkhead, to the "black" elevator cable turnbuckle. The pitch trim motor was in an approximate neutral position.

The nose landing gear assembly, which was buckled aft under the engine, remained attached to the engine mount. Both the left and right main landing gear assemblies remained attached to the wing. No airframe anomalies were noted during the on-site examination.

Examination of the engine found that it had remained partially attached to the airframe via the engine mount and various cables and lines. The engine exhibited damage and was partially buried in the ground.

The top spark plugs were removed and exhibited dark grey combustion deposits and normal wear signatures when compared to the Champion Check A Plug chart.

The cylinder combustion chambers were visually inspected using a lighted borescope. Light

colored combustion deposits were present in the combustion chambers and no anomalies were noted to the cylinder walls, pistons, and valves.

The fuel injectors and fuel injector lines were removed and found to be unobstructed. The fuel manifold valve was removed from the engine and the lead seal and safety wire were present. The fuel manifold valve was disassembled and the screen was free of debris. The fuel manifold valve retaining nut was tight and secure. Fuel was found in the fuel manifold valve body.

The magnetos were found undamaged and remained attached to the engine. The magnetos were removed and the drive shaft rotated by hand with impulse coupling engagement observed. A blue spark was observed on all magneto leads when the magneto drive shafts were rotated by hand.

The engine was raised from the ground to facilitate further inspection. The exhaust system was damaged and crushed aft and under the engine and fuselage. The oil sump was visually inspected and a gouge and small puncture were observed near the front of the oil sump. Continuity to the accessory gears was observed and thumb compression was obtained on all six cylinders when the engine was rotated by hand. No preimpact damage to or failures of the engine were identified.

The propeller remained attached to the engine. The propeller spinner remained attached and was crushed aft against the hub. All three propeller blades were broken in the hub. The propeller blades were numbered for reference. Blade number one exhibited aft bending from the root to the tip and had multiple directional scratches throughout. Blade numbers two and three were bent aft, midway from the hub. The propeller blades chambered faces exhibited chordwise and multi-directional scratches and leading edge damage was observed on the outboard halves of the blades.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on March 21, 2008, by the North Carolina Department of Health and Human Services Office of the Chief Medical Examiner, Chapel Hill, North Carolina. The autopsy finding reported the cause of death as blunt force trauma.

Forensic toxicology was performed on specimens from the pilot by the Federal Aviation Administration (FAA) Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The toxicology report stated that there was no Carbon Monoxide, Cyanide or Ethanol detected in blood or urine. However, .019 (ug/ml, ug/g) Diphenhydramine was detected in blood, urine, Pseudoephedrine was detected in urine, and .015 (ug/ml, ug/g) Zolpidem was detected in blood and urine. Diphenhydramine and Pseudoephedrine are over-the-counter medications commonly used for the treatment of allergy symptoms. Zolpidem is a prescription sedative medication known by the trade name Ambien.

TEST AND RESEARCH

The Avidyne System installed on the airplane was sent to the National Transportation Safety Board's Vehicle Recorders Division, Washington, D.C. The Multi-Function Display with a global positioning system was downloaded. A chart was created using the data depicting the flight path of the airplane just prior to the accident. The last hit indicated that the airplane altitude was at 838 feet, vertical speed was down -444 feet per minute, indicated airspeed was 60.3 knots with a pitch attitude of up 4.98 degrees and a left roll of -31.73 degrees.

ADDITIONAL INFORMATION

A review of the Cirrus Design Pilot Operating Handbook, Section 5, Performance Data, found that the stall speed for the airplane with flaps full up and a 30 degree bank angle was 75 knots indicated air speed (KIAS), and 70 KIAS in level flight.

Pilot Information

Certificate:	Private	**Age:**	51,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	November 16, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 1, 2007
Flight Time:	604 hours (Total, all aircraft), 248 hours (Total, this make and model), 460 hours (Pilot In Command, all aircraft), 26 hours (Last 90 days, all aircraft), 12 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cirrus	**Registration:**	N615WM
Model/Series:	SR22	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	SR22-2027
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 11, 2007 Annual	**Certified Max Gross Wt.:**	3400 lbs
Time Since Last Inspection:	200.8 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	501 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-550-N
Registered Owner:	On file	**Rated Power:**	310 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	EQY,32 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots / 20 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.06 inches Hg	**Temperature/Dew Point:**	16°C / -6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Carolina Beach, NC (03NC)	**Type of Flight Plan Filed:**	None
Destination:	Weddington, NC (NC21)	**Type of Clearance:**	None
Departure Time:	15:15 Local	**Type of Airspace:**	

Airport Information

Airport:	Aero Plantation NC21	**Runway Surface Type:**	Asphalt
Airport Elevation:	634 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	06	**IFR Approach:**	None
Runway Length/Width:	2400 ft / 60 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	34.986389,-80.757774

Administrative Information

Investigator In Charge (IIC):	Wilson, Ralph
Additional Participating Persons:	John L Crouse; FAA/FSDO; Charlotte, NC Chris Lang; Teledyne Continental Motors Inc.; Mobile, AL Brannon D Mayer; Cirrus Design Corporation; Duluth, MN
Original Publish Date:	March 5, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=67699