



National Transportation Safety Board Aviation Accident Final Report

Location:	Canadian, Texas	Accident Number:	CEN19FA082
Date & Time:	February 15, 2019, 10:00 Local	Registration:	N421NS
Aircraft:	Cessna 421	Aircraft Damage:	Destroyed
Defining Event:	Loss of control in flight	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting a personal cross-country flight with one passenger in his twin-engine airplane. There was no record that the pilot received a weather briefing before the accident flight. While en route to the destination, the pilot was in contact with air traffic control and received visual flight rules flight-following services. About 18 miles from the destination airport, the radar service was terminated, as is typical in this geographic region due to insufficient radio and radar coverage below 7,000 ft. The airplane was heading northeast at 4,900 ft mean sea level (msl) (about 2,200 ft above ground level [agl]). About 4 minutes later, radar coverage resumed, and the airplane was 6 miles west of the airport at 4,100 ft msl (1,400 ft agl) and climbing to the north. The airplane climbed through 6,000 ft msl (3,300 ft agl), then began a shallow left turn and climbed to 6,600 ft msl (3,800 ft agl), then began to descend while continuing the shallow left turn ; the last radar data point showed the airplane was about 20 nm northwest of the airport, 5,100 ft msl (2,350 ft agl) on a southwest heading. The final recorded data was about 13 miles northwest of the accident site.

A witness near the destination airport heard the pilot on the radio. He reported that the pilot asked about the cloud height and the witness responded that the clouds were 800 to 1,000 ft agl. In his final radio call, the pilot told the witness, "Ok, see you in a little bit." The witness did not see the airplane in the air.

The airplane impacted terrain in a slightly nose-low and wings-level attitude with no evidence of forward movement, and a postimpact fire destroyed a majority of the wreckage. The damage to the airplane was consistent with a relatively flat spin to the left at the time of impact. A postaccident examination did not reveal any preimpact mechanical malfunctions or anomalies that would have precluded normal operation. A detailed examination of the cockpit instruments and other portions of the wreckage was not possible due to the fire damage.

A cold front had advanced from the northeast and instrument meteorological conditions prevailed across the region surrounding the accident site and the destination airport; the cloud ceilings were 400 ft to 900 ft above ground level. The airplane likely experienced wind shear below 3,000 ft, and there was likely icing in the clouds. While moderate icing conditions were forecast for the accident site, about the time of

the accident, investigators were unable to determine the amount and severity of icing the flight may have experienced. The weather conditions had deteriorated over the previous 1 to 2 hours. The conditions at the destination airport had been clear about 2 hours before accident, and visual flight rules conditions about 1 hour before accident, when the pilot departed.

Based on the available evidence it is likely that the pilot was unable to maintain control of the airplane, which resulted in an aerodynamic stall and spin into terrain.

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 control of the airplane while in instrument meteorological conditions with icing conditions present, which resulted in an aerodynamic stall and spin into terrain.

Findings

Aircraft	Airspeed - Not attained/maintained
Aircraft	Angle of attack - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Environmental issues	Low ceiling - Contributed to outcome
Environmental issues	Windshear - Effect on operation
Environmental issues	Conducive to structural icing - Effect on equipment

Factual Information

History of Flight

Maneuvering

Loss of control in flight (Defining event)

On February 15, 2019, about 1000 central standard time, a Cessna 421C airplane, N421NS, was destroyed when it was involved in an accident near Canadian, Texas. The pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Recorded flight track data showed that, at 0900, the airplane climbed out from Tradewind Airport (TDW), Amarillo, Texas, and proceeded to the north-northeast toward Hemphill County Airport (HHF). The airplane passed through 5,500 ft mean sea level (msl), then turned northeast and continued to climb to a cruise altitude of about 7,500 ft msl. From 0918 to 0921 the airplane gradually descended until the track data was temporarily lost at 4,900 ft msl and 13 nm southwest of HHF.

The pilot was receiving visual flight rules (VFR) flight following services from Amarillo terminal radar approach control (AMA TRACON), who transferred him to Albuquerque Center (ZAB) Sector 15, which were terminated at 0920 when the airplane was 18.7 miles southwest of HHF. The pilot did not request an instrument approach or solicit any other assistance from air traffic control.

At 0925, about 6 nm west of HHF, the flight track resumed, and the airplane was recorded at 4,100 ft msl and climbing to the north. The airplane continued to the north and climbed through 6,000 ft msl, then began a shallow left turn and continued to climb to 6,600 ft msl. The shallow left turn continued, but the airplane began a descent; the final recorded data ended at 0935; the airplane was about 20 nm northwest of HHF, at an altitude of 5,100 ft msl on a southwest heading. The final recorded data was about 13 nm northwest of the accident site.

A witness located about 5 miles northeast of HHF was monitoring the common traffic advisory frequency at HHF about 0915 to 0930. He reported that he heard the pilot over the radio and responded since he recognized his voice. The witness reported that the pilot asked about the cloud height; the witness responded that the clouds were 800 to 1,000 ft above ground level (agl). The witness reported that he had checked all of the local automated weather reports about 0900, which indicated the cloud were 700 to 1,000 ft agl and visibility 6 to 10 miles. In his final radio call, the pilot responded to the witness, "Ok, see you in a little bit." The witness did not see the airplane in the air. The witness reported that at 1006 he was notified of a fire west of Canadian, so he flew his helicopter to the fire and discovered that the airplane had crashed.

Pilot Information

Certificate:	Private	Age:	75, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Lap only
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	July 26, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	January 18, 2018
Flight Time:	(Estimated) 5000 hours (Total, all aircraft)		

Passenger Information

Certificate:		Age:	49, Female
Airplane Rating(s):		Seat Occupied:	Right
Other Aircraft Rating(s):		Restraint Used:	Lap only
Instrument Rating(s):		Second Pilot Present:	No
Instructor Rating(s):		Toxicology Performed:	No
Medical Certification:		Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

A review of the pilot's available logbook entries from 2014 to 2016 revealed that the pilot had completed several GPS instrument approaches and accumulated 23.8 hours of simulated instrument flight time and 18 hours of actual instrument flight time during that period. A logbook entry indicated that the pilot completed a flight review in the accident airplane in January 2018. The only logbook entries after 2016, was the 2018 flight review.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N421NS
Model/Series:	421 C	Aircraft Category:	Airplane
Year of Manufacture:	1980	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	421C-0874
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	June 14, 2018 Annual	Certified Max Gross Wt.:	7500 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:	6227.4 Hrs as of last inspection	Engine Manufacturer:	Continental
ELT:	C91 installed, not activated	Engine Model/Series:	GTSIO-520-L
Registered Owner:		Rated Power:	375 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

The airplane was not equipped with anti-icing or de-icing equipment.

An acquaintance who spoke with the pilot and was familiar with the airplane reported that the airplane's horizontal situation indicator and pressurization system were not working, and he did not know if the pilot had them repaired. He did not give an exact timeframe for the non-working components.

A review of the maintenance logbooks revealed that on January 21, 2019, an overhauled horizontal situation indicator was installed in the airplane, which replaced an old unit that had malfunctioned. There was no record of any unresolved maintenance issues for the accident airplane.

Archived FAA documentation for the airplane revealed that a Garmin GNS-530W GPS system and related components were installed in the airplane in June 2008.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	Condition of Light:	Day
Observation Facility, Elevation:	KHHF, 2396 ft msl	Distance from Accident Site:	8 Nautical Miles
Observation Time:	09:55 Local	Direction from Accident Site:	92°
Lowest Cloud Condition:		Visibility	7 miles
Lowest Ceiling:	Overcast / 800 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	11 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	40°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.85 inches Hg	Temperature/Dew Point:	-1° C / -2° C
Precipitation and Obscuration:	In the vicinity - None - Unknown precipitation		
Departure Point:	Amarillo, TX (TDW)	Type of Flight Plan Filed:	VFR
Destination:	Canadian, TX (HHF)	Type of Clearance:	VFR; VFR flight following
Departure Time:	09:00 Local	Type of Airspace:	Class E; Class G

Instrument meteorological conditions prevailed across the region surrounding the accident site. Cloud bases were solid overcast; at HHHF the ceiling was 800 ft agl, about 30 miles west of HHHF at Mesa Vista Ranch Airport (TX13), Pampa, Texas, the ceiling was about 900 ft agl, and about 33 miles southwest of HHHF at Perry Lefors Field Airport (PPA), Pampa, Texas, the ceiling was at 400 ft agl. At each of these stations the ceiling rapidly deteriorated over the previous 1 to 2 hours. The conditions at HHHF had been clear about 2 hours before accident, and visual flight rules conditions about 1 hour before accident.

A cold front had advanced from the northeast, and produced some wind shear in the lowest 3,000 ft agl. The wind between the surface and about 3,800 ft msl was from the northeast at 6 to 8 knots. However, at 4,300 ft msl, the wind was from west-southwest at 8 knots, and increased in magnitude above this level to a west wind of about 40 knots at 5,700 ft msl. There was potential for severe or greater turbulence between about 3,700 ft and 5,700 ft msl. Clouds were estimated between about 3,100 ft and about 4,500 ft msl. There was likely some icing in the clouds between the bases and tops, and there was also potential for light icing below 4,300 ft msl. The atmosphere was below freezing below about 4,350 ft msl and a steep temperature inversion was noted between about 3,750 ft and about 5,700 ft msl.

AIRMET advisories for instrument flight rules conditions, for moderate turbulence below flight level (FL) 180, and for moderate icing between the freezing level and FL230 were active for the accident site at the accident time.

The investigation did not find any record that pilot received a weather briefing on the day of the accident. The pilot was receiving VFR flight following services from air traffic control during a time when instrument meteorological conditions were known and reported.

The witness who responded in his helicopter reported that when he arrived at the accident site the clouds were overcast at 500 ft agl, 10 miles visibility, temperature 27°F, and light wind from the north.

Airport Information

Airport:	Hemphill County HHF	Runway Surface Type:	Asphalt
Airport Elevation:	2396 ft msl	Runway Surface Condition:	Unknown
Runway Used:	04	IFR Approach:	Unknown
Runway Length/Width:	5004 ft / 75 ft	VFR Approach/Landing:	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	On-ground
Ground Injuries:	N/A	Aircraft Explosion:	On-ground
Total Injuries:	2 Fatal	Latitude, Longitude:	35.906112,-100.5736(est)

The airplane impacted remote terrain and a post impact fire consumed a majority of the wreckage (see figure 1).



Figure 1 – Aerial image of the accident site. A majority of the airplane was consumed by fire.

A postaccident examination indicated the airplane impacted the ground in a slight nose-low and wings-level attitude and there was no evidence of forward momentum. All major airplane components were observed at the accident site. The empennage was displaced to the right. The flap setting was 15° extended. The cockpit and instrumentation were destroyed by fire and none of the components could be examined. The engines were found embedded in the mud and all propeller blades were accounted for. The engines and propellers exhibited signatures consistent with rotation at the time of impact. The examination did not reveal any preimpact mechanical malfunctions or anomalies that would have precluded normal operation.

Medical and Pathological Information

South Plains Forensic Pathology, Lubbock, Texas, performed an autopsy on the pilot. The cause of death was blunt force injuries.

Toxicology testing performed at the FAA Forensic Sciences Laboratory identified tadalafil, which is a prescription medication used to treat erectile dysfunction and the symptoms of benign prostatic hyperplasia. The FAA recommends not flying for 36 hours after use of this medication. FAA toxicology also identified a small amount of ethanol in muscle but not in brain. After absorption, ethanol is uniformly distributed throughout all tissues and body fluids; therefore, the finding in one tissue but not another is consistent with post-mortem production in these samples. Another alcohol, n-propanol, was also identified in the testing and it is also produced postmortem. The tested samples sustained putrefaction.

Preventing Similar Accidents

Reduced Visual References Require Vigilance

About two-thirds of general aviation accidents that occur in reduced visibility weather conditions are fatal. The accidents can involve pilot spatial disorientation or controlled flight into terrain. Even in visual weather conditions, flights at night over areas with limited ground lighting (which provides few visual ground references) can be challenging.

Preflight weather briefings are critical to safe flight. In-flight, weather information can also help pilots make decisions, as can in-cockpit weather equipment that can supplement official information. In-cockpit equipment requires an understanding of the features and limitations.

We often see pilots who decide to turn back after they have already encountered weather; that is too late. Pilot's shouldn't allow a situation to become dangerous before deciding to act. Additionally, air traffic controllers are there to help; be honest with them about your situation and ask for help.

Even when flying at night, visual weather conditions can also be challenging. Remote areas with limited ground lighting provide limited visual reference cues for pilots, which can be disorienting or render rising terrain visually imperceptible. Topographic references can help pilots become more familiar with the terrain. The use of instruments, if pilots are proficient, can also help pilots navigate these challenging areas.

See http://www.nts.gov/safety/safety-alerts/documents/SA_020.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):	Lindberg, Joshua		
Additional Participating Persons:	William Fitzgerald; Federal Aviation Administration; Lubbock, TX Andrew Hall; Textron Aviation; Wichita, KS Kurt Gibson; Continental Motors; Mobile, AL		
Original Publish Date:	December 3, 2020	Investigation Class:	2
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=98986		

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