



National Transportation Safety Board Aviation Accident Final Report

Location:	Laddonia, MO	Accident Number:	CEN17FA288
Date & Time:	07/27/2017, 0452 CDT	Registration:	N701XL
Aircraft:	ZENITH CH701SP	Aircraft Damage:	Destroyed
Defining Event:	VFR encounter with IMC	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

Although he had no night or instrument flight experience, the sport pilot departed in a non-instrument-certificated light sport airplane at night with an overcast ceiling and thunderstorms in the area. Radar data showed that the airplane proceeded on course for about 9 minutes and then entered a right descending turn that continued to ground impact, which was consistent with the pilot attempting to return to the departure airport and not paying attention to his altitude. Examination of the accident site revealed that the airplane struck open level farm land in a right wing-low, nose-low attitude. Examination of the engine and airframe did not reveal any evidence of preimpact anomalies that would have precluded normal operation. It is likely that the pilot continued visual flight into an area of instrument meteorological conditions, which resulted in the pilot experiencing a loss of visual reference and subsequent spatial disorientation.

The pilot had a history of chronic insomnia treated with temazepam, a sedating benzodiazepine, and was regularly prescribed hydrocodone, an opioid analgesic. Toxicology testing detected these drugs and their metabolites in the pilot's system. The pilot was likely impaired by effects from his use of temazepam, and the impairing effects of temazepam were likely enhanced by the pilot's use of hydrocodone. It is likely that the pilot's decision-making was degraded due to his combined use of temazepam and hydrocodone.

Probable Cause and Findings

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

The pilot's decision to take off at night and continue visual flight into instrument meteorological conditions, which resulted in the pilot becoming spatially disoriented and losing control of the airplane. Contributing to the accident were the pilot's degraded decision-

making due to his use of a combination of impairing prescription drugs, and the pilot's lack of instrument and night flight experience.

Findings

Aircraft	Performance/control parameters - Not attained/maintained (Cause)
Personnel issues	Decision making/judgment - Pilot (Cause) Spatial disorientation - Pilot (Cause) Aircraft control - Pilot (Cause) Prescription medication - Pilot (Factor) Decision making/judgment - Pilot (Factor) Qualification/certification - Pilot (Factor) Total instrument experience - Pilot (Factor)
Environmental issues	Below VFR minima - Contributed to outcome (Cause) Personal pressure - Contributed to outcome

Factual Information

History of Flight

Enroute	VFR encounter with IMC (Defining event)
Maneuvering-low-alt flying	Collision with terr/obj (non-CFIT)

On July 27, 2017, at 0452 central daylight time, a Zenith CH 701SP, N701XP, was destroyed when it impacted a bean field about 6.5 miles north of Laddonia, Missouri. The sport pilot and passenger were fatally injured. The airplane was registered to and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations (CFR) Part 91*. Instrument meteorological conditions prevailed at the time of the accident, and no flight plan had been filed for the personal cross-country flight. The flight originated from Mexico Municipal Airport (MYJ), Mexico, Missouri, about 0440, and was en route to Whittman Regional Airport (OSH), Oshkosh, Wisconsin.

According to the airport manager at MYJ, the airplane with the pilot and his passenger on board arrived late in the day on July 26, 2017. The pilot said he wanted to get an early morning start because he wanted to arrive at OSH when the control tower opened at 0700. A self-service fuel receipt charged to the pilot's credit card indicated that he purchased 17.8 gallons of fuel at 2038 on July 26. The manager said he believed the pilot and his passenger camped that evening next to the airplane. When the manager arrived at the airport the next morning, the airplane was gone.

According to radar data provided by the U.S. Air Force/Civil Air Patrol, the airplane first appeared on radar at 0443:46 when it was about 5 miles east of MYJ. According to the data, the airplane's altitude varied between 2,000 and 2,800 feet above ground level (agl) as it maintained a northeast heading. The airplane then entered a right descending turn and had completed about 180° when radar contact was lost. The last radar return was at 0452:46, when the airplane was about 6.5 miles northeast of Laddonia, Missouri.

A family member later reported that the airplane was missing and an Alert Notice (ALNOT) was issued on the evening of July 27. Search teams located the wreckage early on the morning of July 28.

Pilot Information

Certificate:	Sport Pilot	Age:	41, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Powered-Lift	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Sport Pilot None	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	08/03/2016
Flight Time:	272 hours (Total, all aircraft), 98 hours (Total, this make and model), 31 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft)		

According to Federal Aviation Administration (FAA) records, the pilot held a sport pilot certificate with a single-engine land rating. He was not instrument rated. A copy of the pilot's logbook contained entries from December 28, 2014, to July 19, 2017. The pilot's logbook entries were inconsistent: some of the entries were entered in tenths of an hour, and other entries were in minutes. The logbook revealed that the pilot had accrued the following flight experience:

Pegasus powered parachute, 162.9 hours
Cessna 150, 5.1 hours
Piper PA-28, 5.0 hours
Aeroprakt A22LS, 0.8 hours
Zenith CH 701SP, 98.3 hours

No night or instrument flight time had been logged. According to 14 *CFR* 61.315(c)(5), sport pilots are prohibited from flying at night.

Aircraft and Owner/Operator Information

Aircraft Make:	ZENITH	Registration:	N701XL
Model/Series:	CH701SP	Aircraft Category:	Airplane
Year of Manufacture:	2003	Amateur Built:	Yes
Airworthiness Certificate:	Experimental Light Sport	Serial Number:	7-4618
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	05/01/2017, Condition	Certified Max Gross Wt.:	1100 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	1142 Hours as of last inspection	Engine Manufacturer:	Rotax
ELT:	C91A installed, not activated	Engine Model/Series:	912ULS
Registered Owner:	On file	Rated Power:	100 hp
Operator:	On file	Operating Certificate(s) Held:	None

The experimental light sport airplane was constructed by a private individual in 2003, and later purchased by the pilot. It was powered by a 100-horsepower Rotax 912ULS engine, driving a 3-bladed Warp-Drive 70-inch fixed pitch composite propeller.

A copy of the maintenance records contained entries from December 11, 2013, to May 1, 2017. A condition inspection was performed on the airframe and engine on May 1, 2017, with 1,142 flight hours recorded in the logbook.

The airplane was not equipped nor certified for instrument flight rules (IFR) flight.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Night
Observation Facility, Elevation:	KMYJ	Distance from Accident Site:	17 Nautical Miles
Observation Time:	0415 CDT	Direction from Accident Site:	200°
Lowest Cloud Condition:		Visibility	1.5 Miles
Lowest Ceiling:	Broken / 1100 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	230°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.94 inches Hg	Temperature/Dew Point:	22° C / 22° C
Precipitation and Obscuration:			
Departure Point:	Mexico, MO (KMYJ)	Type of Flight Plan Filed:	None
Destination:	Oshkosh, WI (KOSH)	Type of Clearance:	None
Departure Time:	0400 CDT	Type of Airspace:	Class G

There was no record that the pilot had obtained a preflight weather briefing.

At 0414, MYJ reported a visibility of 1-1/2 miles in heavy rain, broken clouds at 1,100 feet, and overcast at 1,900 feet.

At 0435, MYJ reported winds from 240° at 7 knots, visibility 7 miles in light rain, broken clouds at 600 feet and 1,200 feet, and overcast at 1,900 feet. The temperature-dew point spread was 1° (23/22). There was distant lightning in the north through east quadrants, and in the west quadrant.

At 0455, MYJ reported winds from 230° at 7 knots, visibility 7 miles, with a thunderstorm and rain in the vicinity. There were scattered clouds at 600 feet, broken clouds at 3,300 feet, and overcast skies at 4,800 feet. The temperature-dew point spread was 1°, and there was distant lightning in the north through east quadrants and in the west quadrant.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	39.334444, -91.685833

The accident site was located 6.5 miles northeast of MYJ in open level farm land. Green position light lens fragments were found at the beginning of a ground scar that was 36 feet long and aligned on a magnetic course of 121°. At the end of the ground scar was a water-filled impact crater, followed by a debris path that extended 252 feet on a magnetic course of 130°, which was about the direction to MYJ. The crushed right wing and lesser damaged left wing were located farther down the debris path, preceded by a flap and aileron. The fuselage, cockpit, and empennage were located 84 feet from the impact crater and to the left of the debris path. The engine was located 210 feet from the impact crater.

Medical And Pathological Information

The Boone/Callaway County Medical Examiner's Office, Columbus, Missouri, performed an autopsy on the pilot. According to the autopsy report, death was attributed to "blunt force injuries." The toxicology screen on the pilot performed by St. Louis University's Toxicology Laboratory Berkeley, Missouri, revealed the presence of 0.040 gm% (40 mg/dl) ethanol, 0.11 micrograms/ml temazepam, 33 micrograms/ml acetaminophen, and 0.91 micrograms/ml sertraline.

FAA's Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma, performed toxicology screening that revealed the presence of 10 (mg/dL, mg/hg) ethanol in urine, and 36 (mg/dL, mg/hg) ethanol in blood. Propanol, a metabolite of ethanol, was detected in blood and urine. The presence of propanol is consistent with postmortem alcohol production. The report noted that putrefaction had occurred, and the blood was unsuitable for carbon monoxide analysis. Also detected were 114.72 (ug/ml, ug/g) acetaminophen in urine; 0.007 (ug/mL, ug/g) dihydrocodeine in blood and 0.067 (ug/mL, ug/g) in urine; 0.144 (ug/ml, ug/g) hydrocodone in urine but not in blood; 0.054 (ug/mL, ug/g) hydromorphone in urine; 0.36 (ug/ml, ug/g) oxazepam in urine but not in blood; an unknown quantity of sertraline in urine and 1.23 (ug/mL, ug/g) in blood, and an unknown quantity of salicylate in urine.

According to the pilot's medical records, the pilot had a history of chronic insomnia that was being treated with temazepam. (Oxazepam is a psychoactive metabolite of temazepam. Temazepam (Restoril) is "a sedating benzodiazepine available by prescription and intended for short-term treatment of insomnia." The drug carries several warnings, including "concomitant

use of benzodiazepines, including temazepam and opioids, may result in profound sedation, respiratory depression, coma, and death." There is also a warning that the drug can cause "behavior changes, such as increased aggressivity, and patients using it may engage in complex behaviors while under its influence, such as 'sleep driving'" that they may later not recall.

The pilot was also being treated for anxiety with sertraline, and had been regularly prescribed hydrocodone. Sertraline (Zoloft) is a prescription antidepressant that is not considered impairing.

Hydrocodone, an opioid analgesic, is considered impairing and carries warnings about risks of central nervous system and respiratory depression, particularly when combined with benzodiazepines. In addition, the drug information warns that it "may impair the mental or physical abilities needed to perform potentially hazardous activities such as driving a car or operating machinery."

Administrative Information

Investigator In Charge (IIC):	Arnold W Scott	Report Date:	10/10/2018
Additional Participating Persons:	George Holtman; FAA Flight Standards District Office; St. Louis, MO Robert Spahr; FAA Flight Standards District Office; St. Louis, MO		
Publish Date:	10/10/2018		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=95688		

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