National Transportation Safety Board
Aviation Accident Final Report

Location:	Tooele, Utah	**Accident Number:**	WPR15FA082
Date & Time:	January 9, 2015, 16:15 Local	**Registration:**	N383GM
Aircraft:	CIRRUS DESIGN CORP SR22	**Aircraft Damage:**	Substantial
Defining Event:	Loss of visual reference	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The noninstrument-rated private pilot departed during the late afternoon and flew over the southern portion of the Great Salt Lake. According to data recovered from the airplane's avionics system, which did not capture altitude, the duration of the flight was about 9 minutes. During the final minute of the flight, the airplane conducted a gradual left turn at an engine power setting of about 2,200 rpm. Shortly thereafter, the airplane impacted the lake. Postaccident examination of the airplane revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

Local meteorological observations indicated that restricted visibility and fog were forecast throughout the area about the time of the accident. It is likely that the pilot encountered these conditions inflight and lost visual reference to the ground and/or horizon. Given the pilot's lack of an instrument rating and of recent instrument flight experience, the loss of visual reference likely resulted in spatial disorientation.

Toxicological testing on the pilot revealed the presence of bupropion, an antidepressant; hydrocodone, an opiod analgesic; and diphenhydramine, a sedating antihistamine. The investigation was unable to determine if the use of bupropion or the cognitive effects of any underlying depression contributed to the accident. Because the hydrocodone was found in the urine but not the blood, it no longer caused systemic effects and played no role in the accident. However, it is likely that the effects of diphenhydramine impaired the pilot's cognitive and psychomotor performance at the time of the accident, and contributed to his spatial disorientation.

Probable Cause and Findings

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

The non-instrument rated pilot's decision to depart into low visibility conditions, which resulted in spatial disorientation and a loss of control. Contributing to the accident was the pilot's impaired performance due to his use of the sedating antihistamine, diphenhydramine.

Findings

Environmental issues	Low visibility - Effect on personnel
Personnel issues	Spatial disorientation - Pilot
Personnel issues	OTC medication - Pilot
Personnel issues	Decision making/judgment - Pilot
Personnel issues	Use of equip/system - Pilot

Factual Information

History of Flight

Enroute	Loss of visual reference (Defining event)
Enroute	Altitude deviation
Enroute	Controlled flight into terr/obj (CFIT)

On January 9, 2015, about 1615 mountain standard time, a Cirrus Design Corp. SR22, N383GM, sustained substantial damage when it impacted water about 7 miles north of the Bolinder Field-Tooele Valley Airport (TVY), Tooele, Utah. The airplane was registered to and operated by the pilot under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91. The private pilot, who was the sole person on board, was fatally injured. Visual flight rules (VFR) meteorological conditions prevailed, and no flight plan had been filed. The personal flight departed South Valley Regional Airport (U42), Salt Lake City, Utah about 1605 for an unknown destination.

The Federal Aviation Administration (FAA) issued an Alert Notification (ALNOT) for the missing airplane after a family member was concerned that the pilot had failed to return from the local flight. A search ensued, and the following morning, the county police department reported that the airplane wreckage was located in the Great Salt Lake.

The airplane was equipped with an Avidyne Entegra Multifunctional Display (MFD). Each display included a compact flash (CF) memory card that had a flight data log feature that stores periodic information such as engine parameters and flight track data. Specifically, the MFD records GPS position, engine performance data (such as RPM, engine temperatures, outside air temperature, fuel flow), and some electrical bus conditions. The pilot's display, CF card, was recovered and sent to the National Transportation Safety Board (NTSB) Vehicle Recorder Laboratory for the download of the data. (A published report on the recorded flight data obtained from the accident airplane is available in the public docket).

The CF card contained partial data for the accident flight, however no altitude information was recorded. The data revealed that the airplane took off at 1605:30. There was a short interruption of GPS data just after takeoff and the first recorded position placed the airplane about 1.3 miles northwest of the departure end of runway 34, at U42, at 1608:30. The airplane's ground track continued northwest until it crossed the eastern shoreline of the Great Salt Lake at 1612:06. The airplane then turned more in a westerly direction over the southern portion of the lake. At 1613:42, the final minute of the data recording showed the airplane's engine speed and manifold pressure fall from 2400 to 2200 rpm and from 23 inches to 18 inches of mercury, until the data stopped recording at 1614:48.

Radar data revealed that the airplane turned left to a heading of approximately 210º magnetic and flew this heading for approximately 3.0 nautical miles at an average ground speed of 170 knots, during the final minute of flight. No airplane altitude information was available since the airplane's transponder was not turned on. While the destination of the flight was undetermined, the airplane's heading was consistent with a flight towards TVY.

Pilot Information

Certificate:	Private	**Age:**	69,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	May 3, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 29, 2013
Flight Time:	(Estimated) 691.5 hours (Total, all aircraft), 39.5 hours (Total, this make and model), 65 hours (Last 90 days, all aircraft), 0 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

The pilot, age 69, held a private pilot certificate with an airplane single engine land rating. He was issued a third-class airman medical certificate on May 3, 2013, with no limitations stated. The pilot stated during the examination that he had accumulated a total of 650 flight hours. Additionally, according to the pilot's logbooks, he had logged 65.1 hours in the last 90 days.

The pilot did not possess an airplane instrument rating. However, he started to work on obtaining an instrument rating in 2013, accumulating about 12.7 hours in flight training. No further instrument training was identified after June, 2013.

Aircraft and Owner/Operator Information

Aircraft Make:	CIRRUS DESIGN CORP	**Registration:**	N383GM
Model/Series:	SR22 NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:	2003	**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	0555
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	November 21, 2014 Annual	**Certified Max Gross Wt.:**	3400 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1145.1 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed, not activated	**Engine Model/Series:**	IO-550 SERIES
Registered Owner:		**Rated Power:**	0 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The four-seat, low-wing, fixed-gear airplane, serial number (S/N) 0555, was manufactured in 2003. It

was powered by a Continental-IO-550-N engine, serial number (S/N) 687430, rated at 310 horsepower. The airplane was also equipped with a Hartzell propeller. A review of the maintenance logbooks revealed that the annual inspection was completed on November 21, 2014, at an airframe total time of 1,145.1 hours. The airplane's weight and balance during the accident flight, was calculated to be within prescribed weight and center of gravity limitations.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Unknown	**Condition of Light:**	Day
Observation Facility, Elevation:	SLC,4227 ft msl	**Distance from Accident Site:**	21 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Scattered / 11000 ft AGL	**Visibility**	3 miles
Lowest Ceiling:	Broken / 21000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	3°C / 0°C
Precipitation and Obscuration:	N/A - None - Haze		
Departure Point:	SALT LAKE CITY, UT (U42)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	16:05 Local	**Type of Airspace:**	Unknown

Weather conditions recorded at the Salt Lake City International Airport, located about 21 miles east of the accident site, revealed that at 1553, conditions were wind 280 degrees at 6 knots, visibility 3 statute miles, hazy, temperature 37 degrees Celsius, dew point 32 degrees Celsius and an altimeter setting of 30.12 inches of mercury.

For the area of the accident site, there were no forecast Center Warning Advisory (CWAs) or Significant Meteorological Information (SIGMETs). However, several reports advised of reduced visibility by the lake shore. An Airmen's Meteorological Information (AIRMET) issued at 1345, and valid during the accident time, indicated visibility below 3 statute miles (SM) and mist and fog. The local National Weather Service issued a short term forecast at 1050, that indicated dense fog near the accident location. "Dense fog is most pronounced near the shore of the Great Salt Lake from Western Salt Lake County through Grantsville." Further at 1526, a Dense Fog Advisory was issued for the area to include the shores of Great Salt Lake along the Wasatch Front, but not specifically the accident location. However, the report advised about the accident area. "The Salt Lake/Tooele Valleys … fog should remain more patchy...though still could be locally dense near the lake." At 1630, about 15 minutes after the accident time, a hazardous weather outlook was issued, that identified dense fog along the southern shores of Great Salt Lake. Reference the weather factual report in the public docket for additional information.

Airport:		**Runway Surface Type:**	Water
Airport Elevation:		**Runway Surface Condition:**	Water-calm
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	40.77639,-112.4925(est)

Examination of the accident site by the NTSB, investigator-in- charge, revealed the airplane impacted the water about 7 miles west of the Great Lake State Parks Marina. Most major components of the airplane were contained within 15 feet of the main wreckage site. The main wreckage consisted of the wings, fuselage, and tail section floating in the water. The wreckage was anchored in place by control cables and airplane wiring attached to instrument panel and firewall, which were resting at the bottom of the lake. Miscellaneous wreckage debris was located on the lake surface, within about 1 mile of the main wreckage. The airplane was observed partially submerged in the water at a heading of about 055 degrees magnetic and situated in water about 8 feet deep. The airplane's fuselage was rolled on its right side.

The engine had separated from the main fuselage and was not located. All flight control surfaces were located, with the exception of the left aileron. The Cirrus Airframe Parachute System (CAPS) safety pin was observed in the activation handle holder and the CAPS was observed not activated.

The examination of the airplane at the accident site revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

Communications

The pilot did not communicate with any FAA facility, therefore no Air Traffic Control communications recordings were available.

Medical and Pathological Information

The State of Utah Department of Health, Office of the Medical Examiner, conducted an autopsy on the pilot on January 11, 2015. The medical examiner determined that the cause of death was "drowning."

The FAA's Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma, performed toxicology tests on the pilot. According to CAMI's report, cyanide, volatiles, and drugs were tested, and had positive findings for Bupropion, Dihydrocodeine, Hydromorphone, and Losartan.

Bupropion is a prescription antidepressant medication also used as an adjunct for smoking cessation. It is commonly marketed with the names Wellbutrin and Zyban. Hydrocodone, metabolites are Dihydrocodeine and Hydromorphone. Diphenhydramine is a sedating antihistamine used to treat allergy symptoms and as a sleep aid. It is available over the counter under the trade names Benadryl and Unisom. Diphenhydramine carries the following FDA warning: may impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g., driving, operating heavy machinery). Hydrocodone is a prescription opioid analgesic and a Schedule II controlled substance. It is most commonly marketed in combination with acetaminophen with the names Lortab and Vicodin. Losartan is a prescription medication for hypertension, commonly marketed with the name Cozaar.

The positive findings were reviewed by the NTSB's Chief Medical Officer. Reference the Medical Factual Report in the public docket for additional information.

Tests and Research

Further examination of the airframe revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. See the examination report in the public docket for additional information.

The airplane's Pilot's Operating Handbook states, to remove the CAPS safety pin during the pre-flight of the airplane.

According to the FAA Instrument Flying Handbook, page vii, "many accidents are the result of pilots who lack the necessary skills or equipment to fly in marginal visual meteorological conditions (VMC) or IMC and attempt flight with outside references." Further, on page 3-9 of the handbook, warns that "flying into fog can create an illusion of pitching up." The FAA Pilot's Flying Handbook, page 3-8, states that "if the natural horizon were to suddenly disappear, the untrained instrument pilot would be subject to vertigo, spatial disorientation, and inevitable control loss. Finally, the handbook on page 17-15, states "accident statistics show that the pilot who has not been trained in attitude instrument flying …lose control of the airplane in about 10 minutes once forced to rely solely on instrument reference."

Administrative Information

Investigator In Charge (IIC):	Nixon, Albert	**Report Date:**	
Additional Participating Persons:	Matthew Green; FAA; Salk Lake City, UT Brad Miller; Cirrus Aircraft; Duluth, MN Kurt Gibson; Continental Motors Inc.; Mobile, AL		
Publish Date:			
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=90588		