



Aviation Investigation Final Report

Location:	Alpine, Wyoming	Accident Number:	WPR16FA046
Date & Time:	January 4, 2016, 16:15 Local	Registration:	N912EB
Aircraft:	AEROSTAR S A YAK 52	Aircraft Damage:	Destroyed
Defining Event:	Controlled flight into terr/obj (CFIT)	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting a local aerobatic flight with a pilot-rated passenger occupying the rear seat (which was equipped with flight controls). The pilot's son was flying another airplane, returning to the home airport after a local sightseeing flight. The airport was at the southeast corner of a reservoir, which surrounded the airport on three sides (all but the east side). The accident site was located on flat, featureless, snow-covered terrain northwest of the airport. The son reported that, as he was flying north away from the airport over the west side of the reservoir, it was frozen over, and covered with snow. He stated that the surface was flat with no cracks, and the lighting was flat as well so that he had difficulty judging his height above the ground. As he continued north, the surface showed some cracks, which helped him with height visualization. About 7 miles north of the airport, he transitioned to the east side of the reservoir, and headed south toward the airport. The son's airplane was about 200 ft above ground level and several miles from the runway on final approach, when an exchange of radio transmissions led the son to believe that his father was going to pass by him. He never saw his father's airplane. An airplane witness had just taken off from the airport in another airplane; he saw the son's airplane on a 2-mile final approach and then saw a debris field forming as the accident airplane impacted the ground behind the son's airplane.

Examination of the accident site and the wreckage indicated that the airplane impacted the ground at high speed in a near level attitude, consistent with controlled flight into terrain. No evidence of any preimpact mechanical malfunctions or anomalies was found. It is likely that, as a result of the flat light conditions described by the pilot's son, the pilot did not realize he was descending over the featureless, snow-covered terrain.

The pilot had undiagnosed heart disease, which placed him at significant risk for sudden severe impairment/incapacitation from an acute cardiovascular event such as a heart attack, arrhythmia, or stroke. However, the operational evidence indicated that this crash was controlled flight into terrain with a pilot rated passenger in the rear seat who could have taken over in the event the pilot became severely impaired or incapacitated. As a result, it is unlikely the pilot's heart disease contributed to the accident.

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 clearance from snow-covered terrain in flat light conditions.

Findings

Personnel issues	Monitoring environment - Pilot
Aircraft	Altitude - Not attained/maintained
Environmental issues	Flat light - Decision related to condition
Environmental issues	Snowy/icy terrain - Awareness of condition

Factual Information

History of Flight

Maneuvering

Controlled flight into terr/obj (CFIT) (Defining event)

On January 4, 2016, about 1615 mountain standard time, an experimental Aerostar SA YAK-52, N912EB, collided with terrain while maneuvering near Alpine Airport, Alpine, Wyoming. The private pilot and the pilot-rated passenger sustained fatal injuries; the airplane was destroyed. The airplane was registered to and operated by Wyoming Wings LLC under the provisions of 14 Code of Federal Regulations Part 91. The local personal flight departed Alpine Airport about 1530. Visual meteorological conditions prevailed, and no flight plan had been filed.

Family members reported that the accident airplane departed, and went to an area northwest of the airport where the pilot planned to perform aerobatic maneuvers. Two other airplanes, one flown by the accident passenger's father, and the other by the accident pilot's son, then departed on local sightseeing flights. The passenger's father returned to the airport, landed on runway 13, and turned the airplane toward the southwest on a taxiway as he prepared to depart on runway 31, which was standard practice at the airport when winds permitted. He saw the YAK performing aerobatics west of the airport and heard the accident pilot's son report on a 3-mile final straight in for runway 13. He departed runway 31, and immediately turned 90° to the west to clear the area for the landing traffic. As he reached pattern altitude, he saw the debris field forming on the snow-covered ground behind the accident pilot's son's airplane, which was on a 2-mile final approach. He flew over the site, and broadcast that the YAK was down. He made a couple of passes over the site before landing. He noted that the sky was slightly cloudy, and low light conditions were present.

The accident pilot's son stated that he departed after his father, and flew along the east side of a reservoir before turning south to overfly the family's home. He returned to the north and maneuvered to the west side of the reservoir. As he proceeded north, he descended over the reservoir, which was frozen over and covered with snow. He stated that the surface had no cracks, and the lighting was flat so that he had difficulty judging his height above the ground. As he continued north, the surface showed some cracks, which helped him with height visualization. About 7 miles north of the airport, he transitioned to the east side of the reservoir, and headed south toward the airport. He was about 5 miles from the airport, and made a radio call that he was going to land on runway 13. He saw the accident passenger's father's airplane take off and turn to the west. He was about 100 to 200 ft above the ground and over the reservoir about 3 miles from the airport when he heard his father in the YAK make a radio call indicating that the YAK was either going to join up or do a flyby. Because of that transmission, he decided to do a go-around and fly over the airport rather than land. He reported that he and his father had done formation flying, join ups, and flybys previously, and typically his father would break the maneuver off after the join up and low approach. He looked over his shoulder for the join up at his 4- and 7-o'clock positions, and listened for a radio call from his father. The call did not come, and he never saw the YAK. He then heard the accident passenger's father radio him, and realized that something was wrong. He proceeded to the area where the other airplane was circling, and saw a disturbance in the snow. He flew above the other airplane until it departed to land.

An airport resident, who had heard the radio transmissions, went to his window, and was looking for the YAK to fly over. After hearing the conversations, he contacted the pilots in the air and notified the local emergency authorities.

Pilot Information

Certificate:	Private	Age:	61,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	Glider	Restraint Used:	5-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	May 27, 2014
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	2250 hours (Total, all aircraft)		

Pilot-rated passenger Information

Certificate:	Private	Age:	17,Female
Airplane Rating(s):	Single-engine land	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	5-point
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Without waivers/limitations	Last FAA Medical Exam:	May 21, 2014
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	250 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AEROSTAR S A	Registration:	N912EB
Model/Series:	YAK 52 NO SERIES	Aircraft Category:	Airplane
Year of Manufacture:	1983	Amateur Built:	
Airworthiness Certificate:	Experimental (Special)	Serial Number:	832912
Landing Gear Type:	Tailwheel	Seats:	2
Date/Type of Last Inspection:	February 17, 2015 Condition	Certified Max Gross Wt.:	2899 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	VENDENYEV
ELT:	C91A installed, not activated	Engine Model/Series:	M14P
Registered Owner:	On file	Rated Power:	0 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:	K46U	Distance from Accident Site:	2 Nautical Miles
Observation Time:	16:00 Local	Direction from Accident Site:	110°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.94 inches Hg	Temperature/Dew Point:	-3°C / -8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Alpine, WY (K46U)	Type of Flight Plan Filed:	None
Destination:	Alpine, WY (K46U)	Type of Clearance:	None
Departure Time:	15:30 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	43.160884,-111.04104

The airport was at the southeast corner of the reservoir, which surrounded the airport on three sides (all but the east side). The accident site was located on flat, featureless, snow-covered terrain about 2 miles northwest of the airport, and near the extended centerline for the final approach to runway 13. The debris field was 578 ft long on a magnetic heading of 122°. The first identified point of contact was a crater, which measured about 15 ft long, 6 ft wide, and 2 ft deep. On the left side of the beginning of the crater was a piece of the left wing-tip and the pitot tube with about 1 ft buried in the soft dirt; a few feet farther into the crater was a piece of the left aileron. At the end of the crater was a separated propeller blade. The left wing fragmented into several pieces, and most of them were in the first half of the debris field. The inverted right wing was about 400 ft into the debris field along the debris path centerline. The main wreckage consisting of the fuselage and empennage was 500 ft into the debris field. The last major component was the separated engine, which was at the end of the debris field.

The airplane was highly fragmented. All control surfaces and major components of the airplane were identified in the debris field. The airplane had flight controls for both the front and rear seat pilots. All identified disconnects in flight control push-pull tubes were angular and jagged; all identified disconnects in flight control cables were splayed.

The propeller was separated from the engine crankshaft along with the crankshaft propeller flange. The spinner was crushed and exhibited thermal damage. Two of the three blades were separated from the propeller hub. The remaining propeller blade was melted outboard of the mid span point. The remaining portion of crankshaft exposed from the front of the engine case exhibited extensive spiral cracking throughout half of its respective circumference.

Medical and Pathological Information

The Booneville County Coroner's Office, Idaho Falls, Idaho, completed an autopsy of the pilot, and the cause of death was reported as the effect of blunt force injuries. Examination of the body for natural disease during the autopsy was limited by the severity of the pilot's injuries but identified evidence of severe coronary artery disease with areas of up to 80% stenosis and microscopic evidence of damage to the heart muscle from previous ischemia.

The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing of specimens from the pilot, which were negative for performance enhancing drugs or alcohol. The laboratory did not perform tests for carbon monoxide or cyanide.

The drug valsartan was detected in liver and kidney.

A review of medical records indicated that the 61-year-old male pilot, who was seated in the front seat, had reported to the FAA that he had high blood pressure, high cholesterol, and a recent diagnosis of diabetes. At time of his last medical exam, on May 24, 2014, he reported using valsartan for blood pressure, ezetimibe and simvastatin in combination as well as fenofibrate for high cholesterol, and metformin for diabetes. None of these medications carry warnings about performance impairment. His treating physician reported excellent control of his diabetes on his treatment regimen with a hemoglobin A1C of 6.6%.

The 17-year-old female passenger, who was seated in the rear seat, had reported no medical conditions and no medications to the FAA during her only medical exam, dated May 21, 2014. No autopsy was performed and no specimens for toxicology analysis were obtained.

Additional Information

The FAA pamphlet "Flying in Flat Light and White Out Conditions" states in part:

Flat light is an optical illusion, also known as "sector or partial white out." It is not as severe as "white out" but the condition causes pilots to lose their depth-of-field and contrast in vision. Flat light conditions are usually accompanied by overcast skies inhibiting any good visual clues. Such conditions can occur anywhere in the world, primarily in snow covered areas but can occur in dust, sand, mud flats, or on glassy water. Flat light can completely obscure features of the terrain, creating an inability to distinguish distances and closure rates. As a result of this reflected light, it can give pilots the illusion of ascending or descending when actually flying level.

Chapter 17 page 10 of the FAA's Pilot's Handbook of Aeronautical Knowledge discusses featureless terrain illusions. It states that an absence of surrounding ground features, as in an overwater approach, over darkened areas, or terrain made featureless by snow, can create an illusion that an aircraft is at a higher altitude than it actually is during a landing approach. This illusion, sometimes referred to as the "black hole approach," causes pilots to fly a lower approach than is desired.

Administrative Information

Investigator In Charge (IIC):	Plagens, Howard
Additional Participating Persons:	Matt Green; FAA FSDO; Salt Lake City, UT
Original Publish Date:	September 18, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=92522

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).