



# Aviation Investigation Final Report

<b>Location:</b>	Grasmere, Idaho	<b>Accident Number:</b>	WPR22FA173
<b>Date &amp; Time:</b>	May 8, 2022, 14:19 Local	<b>Registration:</b>	N801DT
<b>Aircraft:</b>	BLUE SIDE UP INC COMP AIR 8 SS52	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot and passenger departed on a cross-country flight. Automatic dependent surveillance – broadcast (ADS-B) data indicated that the airplane flew at a cruise altitude between 11,000 ft and 13,000 ft mean sea level (msl) on a north to northeast heading consistent with its planned destination for most of the flight.

About 30 minutes before the end of the flight, the airplane began a descent and then turned east. Shortly thereafter, the pilot of the airplane declared minimum fuel with air traffic control (ATC). A few minutes later the pilot declared critical fuel due to a fuel leak. The pilot stated in his last communication that he would attempt to make a nearby airport. Subsequently, the airplane impacted hilly, desert terrain at an elevation of about 5,780 ft and on a heading of about 034°.

An acquaintance of the pilot who was a flight instructor stated that, on the two previous flights he had flown with the pilot, the left wing of the airplane felt heavy. The accident pilot thought it was because of a fuel imbalance. The postaccident examination revealed that the left tank fuel valve was positioned ON and the right tank valve was positioned OFF, consistent with the pilot balancing the fuel by feeding from the left-wing fuel tank. It is possible that when the pilot noticed the minimum fuel status, he failed to recall that he had previously selected the right-side fuel tank OFF, and thus did not have this fuel available.

Given that the cruise altitudes on the accident flight were similar to what the previous owner used to make his fuel range and duration estimates, even with about a 20% reduction in fuel due to the pilot allowing 2 inches from the top of the fuel tanks during refueling, the airplane should have had adequate fuel to make its destination. A strong smell of fuel and fuel staining were also observed at the accident site.

A review of radar imagery from Boise, Idaho, revealed that the airplane flew through several areas of light to moderate intensity echoes as it proceeded northward, and then after turning eastward, the airplane's flight track was through an area of moderate to heavy intensity echoes. The accident site was located on the southeast edge of the echo. Light-to-moderate icing conditions in the clouds with clear to mixed type icing below 12,000 ft msl were expected. Thus, it is likely that the airplane, which was not certified for flight in icing, encountered icing in the final portion of the flight.

The pilot was flying with insulin-dependent diabetes, having type 1 diabetes mellitus. Given the urine glucose level of 29mg/dL, no detectable glucose in vitreous fluid, and ongoing verbal communication, it is unlikely that the pilot was experiencing significant metabolic disturbance from high blood glucose. Whether he was experiencing less severe effects of high blood sugar could not be determined. Whether he had symptoms of low blood glucose, such as diminished concentration or increased nervousness, is unknown.

The pilot's use of diphenhydramine (Benadryl), which can cause sleepiness, was likely not a factor due to fact that it was detected only in the urine and not in the blood. Thus, it is unlikely that effects of the pilot's diphenhydramine use contributed to the accident.

Accident site signatures and a review of the weather were consistent with a loss of control of the airplane. In addition, an examination of the airframe and engine revealed no evidence of any preimpact mechanical failures or malfunctions that would have precluded normal operation. It is likely that, while maneuvering to an alternate airport due to a critical fuel situation, in icing conditions, the pilot failed to maintain the proper airspeed, which resulted in the exceedance of the airplane's critical angle of attack and the airplane experiencing 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 proper airspeed and his exceedance of the airplane's critical angle of attack, which resulted in an aerodynamic stall.

## Findings

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<b>Aircraft</b>	Airspeed - Not attained/maintained
<b>Aircraft</b>	Angle of attack - Not attained/maintained
<b>Personnel issues</b>	Aircraft control - Pilot
<b>Personnel issues</b>	Use of equip/system - Pilot
<b>Aircraft</b>	Fuel - Fluid management
<b>Environmental issues</b>	Conducive to structural icing - Effect on equipment

## Factual Information

### History of Flight

<b>Maneuvering</b>	Fuel related
<b>Maneuvering</b>	Structural icing
<b>Maneuvering</b>	Unknown or undetermined
<b>Maneuvering</b>	Loss of control in flight (Defining event)

On May 8, 2022, about 1419 mountain daylight time, an experimental amateur-built Comp Air 8 SS52 airplane, N801DT, was substantially damaged when it was involved in an accident near Grasmere, Idaho. The pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The Federal Aviation Administration (FAA) issued an Alert Notification for the missing airplane after the pilot made a distress call and reported critical fuel. A search ensued and the airplane wreckage was located by a search and rescue helicopter shortly afterwards about 7 miles southwest of Grasmere Airport (U91), Grasmere, Idaho.

ADS-B data indicated that the airplane departed Boulder City Municipal Airport, (BLU), Boulder City, Nevada, on a cross-country flight. The airplane was at a cruise altitude between 11,000 ft and 13,000 ft msl on a north to northeast heading consistent with its planned destination for most of the flight.

About 1339 the airplane began a descent, and then about 1357 turned towards the east. Shortly thereafter, the pilot declared minimum fuel with ATC. About 1401, the pilot declared critical fuel due to a fuel leak. About 1406, ATC attempted to contact the flight by relaying through another pilot. The relaying pilot made contact with the accident flight and the accident pilot stated that they would not be able to make Owyhee Airport (10U), Owyhee, Nevada, but would attempt to make U91. About 1410, the last data return indicated that the airplane's altitude was about 6,200 ft msl, heading was 110°, and the ground speed was 121 knots. Subsequently, the airplane impacted terrain.

## Pilot Information

<b>Certificate:</b>	Commercial; Flight instructor	<b>Age:</b>	48, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane single-engine	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	August 14, 2020
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	(Estimated) 1350 hours (Total, all aircraft)		

## Passenger Information

<b>Certificate:</b>		<b>Age:</b>	40, Female
<b>Airplane Rating(s):</b>		<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>		<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>		<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>		<b>Last FAA Medical Exam:</b>	
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>			

The commercial pilot held ratings for airplane single-engine land, multi-engine land, instrument airplane, and flight instructor.

The pilot was issued a FAA third-class airman medical certificate on August 14, 2020, with the following limitations: must wear corrective lenses. He had reported Type I diabetes mellitus. He also reported using insulin lispro, often marketed as Humalog, and insulin largine, often marketed as Lantus. Both types of insulin are used to treat diabetes. The first authorization for Special Issuance for type I diabetes was June 6, 1998, with multiple subsequent renewals. The most recent authorization was dated July 12, 2021.

The pilot reported on his most recent application that he had accumulated 1,350 total hours of flight experience with 50 hours in the 6 months before the examination.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	BLUE SIDE UP INC	<b>Registration:</b>	N801DT
<b>Model/Series:</b>	COMP AIR 8 SS52	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2007	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	027078SS52T03
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	8
<b>Date/Type of Last Inspection:</b>	November 28, 2021 Condition	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Turbo prop
<b>Airframe Total Time:</b>	685.6 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Walter
<b>ELT:</b>	C91A installed	<b>Engine Model/Series:</b>	M601D
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

According to the previous owner, the airplane's fuel system consisted of wet wings that held 230 gallons. In addition, there was a fuel header tank located by the pilot's feet. There was a fuel lever for each side that was selected ON or OFF. For normal operation, he would turn on both side fuel levers. He would check for fuel imbalances and then turn on the fuel lever for the high side and turn off the fuel lever for the low side, if required. He had no major fuel imbalances in his 14 years of flying the airplane. During refueling he would leave about 1 inch from the top. The highest altitude he flew the airplane was about 11,500 ft –12,500 ft msl. At that altitude, the airplane's flight duration was about 4.0 to 4.5 hours and a range of about 800 miles. The accident flight's duration was less than 3 hours.

A previous acquaintance of the pilot, who was a flight instructor, flew in the airplane with the accident pilot on the two flights before the accident. He stated that they both believed that the left wing felt heavy and thought it was because of a fuel imbalance. The flight instructor further stated at times he used two hands to keep the wings level and the airplane felt heavy, especially when in bank. During the postaccident examination, the left tank fuel valve was positioned ON and the right tank valve was positioned OFF, consistent with the pilot balancing the fuel by feeding from the left-wing fuel tank.

During the last airplane refueling, the refueler stated that the pilot requested that the main tanks be filled to about 2 inches from the top. The tanks were observed to be about 10 inches in height during the examination, which could make for about a 20% reduction in the amount of fuel that could be serviced into the tanks. The previous owner stated that he would leave about 1 inch from the top when refueling, to allow for expansion of the fuel.

Furthermore, the previous owner stated that the airplane was instrument certified but had no anti-ice equipment other than the pitot heat.

### Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Unknown	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KTWF, 4166 ft msl	<b>Distance from Accident Site:</b>	52 Nautical Miles
<b>Observation Time:</b>	13:53 Local	<b>Direction from Accident Site:</b>	70°
<b>Lowest Cloud Condition:</b>	Scattered / 2000 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	Broken / 11000 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	4 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	210°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.65 inches Hg	<b>Temperature/Dew Point:</b>	4°C / 2°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Boulder City, NV (BVU)	<b>Type of Flight Plan Filed:</b>	
<b>Destination:</b>	Ontario, OR (ONO)	<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>	11:22 Local	<b>Type of Airspace:</b>	Class G

The Surface Analysis Chart depicted a low-pressure system over central Idaho, north of the accident site, with a trough of low pressure extending east and west from the low. A cold front extended across central Nevada. The accident site was located on the cold air side, or north of the cold front and south of the low-pressure system in central Idaho.

The station models near the accident site depicted a counterclockwise circulation related to the low-pressure system, with northwesterly to southwesterly winds of 4 to 10 knots, light snow showers, overcast cloud cover, temperatures from 35° to 36° F, and the dew point temperatures from 33° to 35° F.

The NWS Storm Prediction Center’s Convective Outlook Chart that was valid for the period and included the accident site revealed a general risk of thunderstorm activity over Idaho during the period.

The NWS 12-hour Low-Level Significant Weather Prognostic Chart depicted general marginal visual flight rules (MVFR) conditions expected to prevail over northern Nevada, Idaho, and Oregon during the period, with the freezing level between 4,000 and 8,000 ft. No significant turbulence below 24,000 ft was expected over Idaho for the period.

NOAA numerical model sounding indicated the density altitude of about 5,452 ft msl and indicated winds were west to northwest about 3 knots. The freezing level was depicted at 711

ft above ground level or about 6,000 ft msl. The atmosphere was characterized as conditionally unstable and supported broken to overcast cumulus clouds capable of producing light rain from about 3,000 ft msl to 20,000 ft msl. The analysis program expected light-to-moderate icing conditions in the clouds, with clear to mixed type icing below 12,000 ft msl. A review of radar imagery from Boise, Idaho, revealed that the airplane flew through several areas of light-to-moderate intensity echoes as it proceeded northward and then turned eastward. At 1417, the airplane's flight track was through an area of moderate-to-heavy intensity echoes, with the accident site on the southeast edge of the echo.

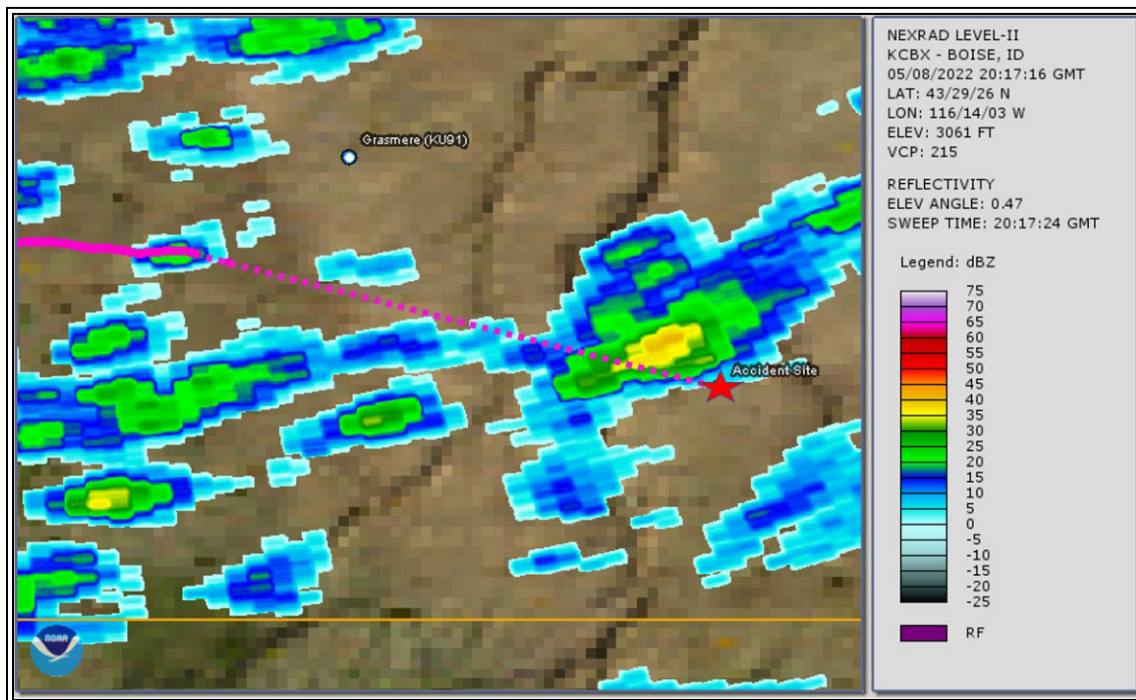


Figure 1: Base reflectivity image for 1417 MDT with flight track.

The wind profile indicated little support for any turbulence below 16,000 ft over the area outside of cumulus clouds.

The 3-hour Graphic Forecast for Aviation, valid from 1200 to 1500 mountain daylight time (MDT), depicted a small area of instrument flight rules and MVFR conditions over the accident site, with surface precipitation in the form of rain, with rain/snow east and west of the accident site. Broken to overcast clouds were expected with bases from 5,000 to 7,000 ft msl and tops to 22,000 ft.

A search of PIREPs revealed that there were no reports in the immediate vicinity of the accident site. One PIREP near Twin Falls, Idaho, reported patchy clouds. Several PIREPs were reported near Boise, Idaho. 2 PIREPs reported moderate turbulence, one at 6,000 ft and one at 10,000 ft. Additionally, one PIREP reported light clear icing at 10,000 ft. Finally, a PIREP from a pilot out of Fresno, California, and about 85 miles southwest of the accident site reported moderate to severe turbulence at 8,000 ft.



There were no active SIGMETs, Convective SIGMETs, or CWA over the accident site at the time of the accident. There was a current AIRMET for mountain obscuration conditions over Idaho, which warned of mountains obscured in clouds, precipitation, and mist.

A search of the FAA contract Automated Flight Service Station provider Leidos indicated that they and no 3rd party vendors using the Lockheed Flight Service (LFS) system had any contact with the pilot of N801DT on May 8, 2022. A separate search of ForeFlight indicated that the accident pilot had an account that included N801DT; however, no flight plans were filed for the accident flight and no weather imagery, or charts were viewed using the ForeFlight app. The pilot of N801DT created a route string from BVU to ONO with a cruising altitude of 7,500 ft, and he did review airport pages for BVI at 1154 MDT, which includes METAR, TAFs, and NOTAMs. There were no indications the pilot reviewed the GFA enroute forecast or in-flight weather advisories before or inflight.

### Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Fatal	<b>Latitude, Longitude:</b>	42.188,-115.58407(est)

Examination of the accident site revealed that the airplane impacted hilly terrain in a remote area with desert terrain on a heading of about 034° and at an elevation of about 5,780 ft. The airplane impacted in manner consistent with a left bank attitude. All major components of the airplane were located at the accident site. There was no post-impact fire.

The first identified point of impact was a ground disturbance where the left position light was found buried. Subsequently, about 20 ft further, the ground markings lead to a large area of disturbed dirt. The ground scar continued from this area to the main wreckage. The airplane came to rest near the top of a hill. Both wings and horizontal stabilizers separated during the accident sequence. The front portion of the fuselage, including the instrument panel, sustained substantial impact damage. The only portion of the airplane that was relatively intact was the vertical stabilizer and rudder. The engine was bent to the right about 90°. The debris trail was about 150 ft long.

There was a strong smell of fuel at the site and fuel staining was observed in the soil of the ground markings. The left main fuel tank was compromised during the impact sequence.

Examination of the left wing's remnants revealed no perforations consistent with a fuel leak. Examination of the right main fuel tank, including an internal examination using a borescope, and the header tank revealed no anomalies. Both fuel caps were examined, and no anomalies were noted. The locking tabs worked appropriately, and the seals were in good condition. The fuel cap vents had no obstruction to flow, as determined by blowing compressed air through them. All fuel lines were attached and examined; no leaks were observed in the lines. The left fuel selector was positioned on, and the right fuel selector was positioned off. There was impact damage near the right fuel selector. The fuel screens in each wing were examined. The left wing's screen was partially deteriorated. The right wing's screen was intact, and some debris was observed. Fuel continuity was established by blowing compressed air through the lines to the engine. The fuel line to the engine had no observable fuel present.

Flight control continuity to the cockpit controls was confirmed and the flaps were determined to be retracted. Postaccident examination of the airframe and engine revealed no evidence of preimpact mechanical failures or malfunctions that would have prevented normal operation.

## **Medical and Pathological Information**

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The Owyhee County Coroner Office, Marsing, Idaho, conducted an autopsy on the pilot; the cause of death was "severe blunt force trauma."

Toxicology testing performed by the FAA's Forensic Sciences Laboratory on the pilot's specimens, detected atorvastatin, salicylic acid, and diphenhydramine. Glucose was measured in the urine at 29 mg/dL.

Atorvastatin (Lipitor) is used to treat high cholesterol and is acceptable for FAA medical certification.

Salicylic acid is a metabolite of aspirin and is also used in several preparations to treat conditions. Aspirin is used to treat minor pain and as an antiplatelet medication to prevent blood clots. Use of aspirin is acceptable for flying if the underlying condition being treated is also acceptable.

Diphenhydramine (Benadryl) is a non-prescription antihistamine for treating seasonal allergies and can cause sedation. It is acceptable for pilots but should not be used within 60 hours of flying and regular use is unacceptable. Diphenhydramine (Benadryl) can cause sleepiness, and depending on when the drug was administered, could have posed a hazard to flight safety.

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Nixon, Albert
<b>Additional Participating Persons:</b>	Daniel Warnick; FAA; Boise, ID
<b>Original Publish Date:</b>	June 20, 2024
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>

**Note:**

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=105052>

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](#).