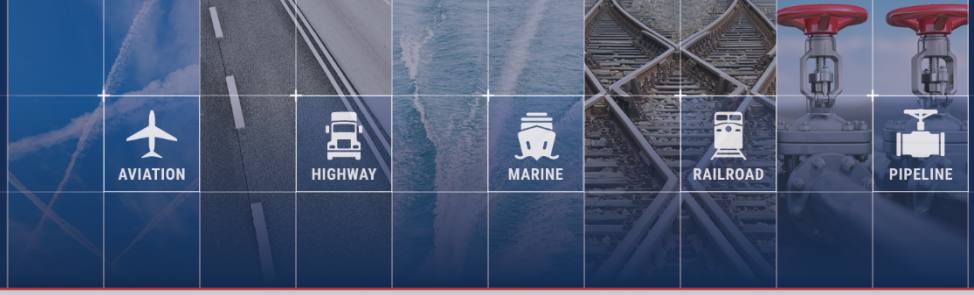

Aviation Investigation Final Report

Location:	Alcova, Wyoming	**Accident Number:**	WPR23FA137
Date & Time:	March 21, 2023, 16:01 Local	**Registration:**	N314FR
Aircraft:	Cessna 182S	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Aerial observation		

Analysis

The pilot was conducting a low-altitude pipeline patrol flight in day visual meteorological conditions when the airplane descended and impacted terrain. According to the flight track data, the airplane overflew Casper, Wyoming, and then turned to a southwest heading for about 30 miles until radar contact was lost; the airplane's altitude was about 600 ft above ground level (agl) and about 950 ft northwest of the accident site.

Postaccident examination of the airplane revealed no evidence of any preaccident mechanical malfunctions or failures that would have precluded normal operation.

A search of archived weather information from Leidos Flight Service and ForeFlight indicated that there were no flight plans or weather briefings requested by the pilot on the day of the accident. It is unknown what weather information, if any, the accident pilot checked or received before departure and through the time of the accident.

The weather forecast information applicable for the accident time indicated an AIRMET TANGO advisory was valid for the accident location and time. Supplemental turbulence information in the form of Graphical Turbulence Guidance (GTG) also indicated light to moderate turbulence for aircraft the size of the accident airplane within 500 to 1,000 ft agl at the time of the accident.

A cold front was identified near the accident site, and mountainous terrain environment, with recorded wind of 20 to 30 knots between the surface and 10,000 ft agl, which made for the potential of low-level wind shear (LLWS) and low-level turbulence. At Casper/Natrona County International Airport (CPR), Casper, Wyoming, recorded wind gusts were as high as 31 knots.

These conditions were likely also present above the terrain at the accident site, and it is likely the accident flight encountered light to moderate turbulence and LLWS.

Probable Cause and Findings

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

The airplane's encounter with low level wind shear associated with moderate turbulence, which resulted in a loss of airplane control.

Findings

Environmental issues	Terrain induced turbulence - Effect on equipment
Aircraft	Altitude - Attain/maintain not possible
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Enroute	Turbulence encounter
Enroute	Loss of control in flight (Defining event)

On March 21, 2023, about 1601 mountain daylight time (MDT), a Cessna 182S, N314FR, was substantially damaged when it was involved in an accident near Alcova, Wyoming. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 aerial observation flight.

The operator reported that the pilot departed Evanston-Uinta County Airport - Burns Field (EVW) Evanston, Wyoming, for an aerial pipeline patrol flight. The operator's flight tracking data showed the airplane's flight track about 30 miles south of Casper, Wyoming, near the accident location in mountainous terrain. The flight track showed no further movement from the accident area and the operator notified Flight Service of a possible mishap. The Federal Aviation Administration (FAA) subsequently issued an Alert Notice (ALNOT).

A company pilot reported that he received an “SOS alert” message about the possible downed airplane and proceeded to the area. He and another company pilot arrived at the coordinates provided and conducted a search for the plane. He flew over the area for about an hour before having to land for fuel. After he departed the area, the other pilot located the airplane. During his flight he had been flying at approximately 1,000 ft agl and noted that it was “fairly windy” and gusty that day. He also experienced some areas of moderate and mountain wave turbulence. It had been bumpy most of the day, but north of Laramie, Wyoming, it seemed to worsen. He did not encounter any significant up or down drafts, but he stated that he would not have been surprised if other pilots had.

Recorded automatic dependent surveillance-broadcast (ADS-B) data showed that the accident airplane overflew Casper at 15:40:48 and turned to a southwest heading for about 30 miles until data was lost at 16:00:44, about 950 ft northwest of the accident site, as seen in Figure 1.

The airplane wreckage was located by a search and rescue air unit later that evening.

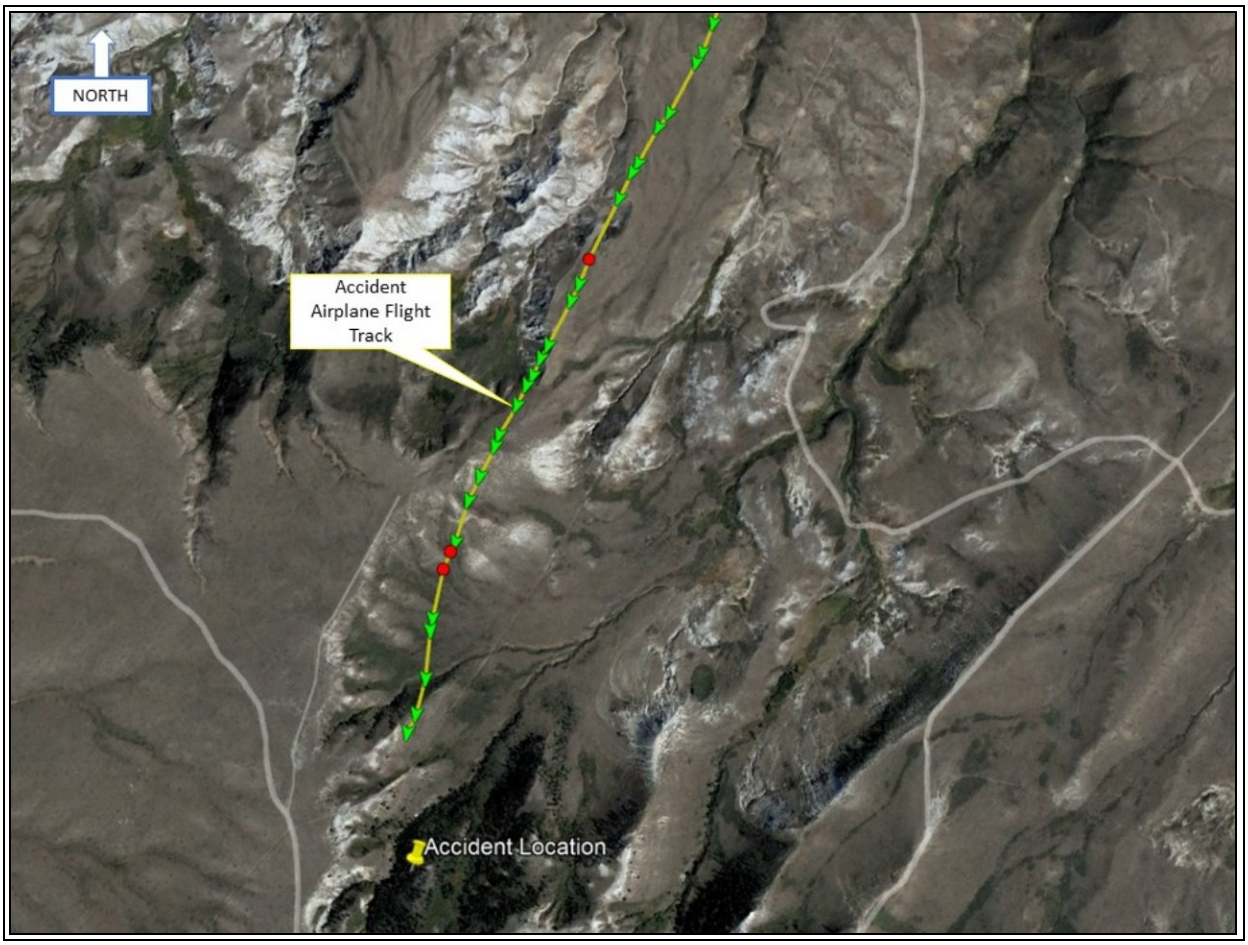

Figure 1. View of accident airplane ADS-B flight track data

Pilot Information

Certificate:	Commercial	**Age:**	49,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	August 22, 2022
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 1630 hours (Total, all aircraft), 1040 hours (Pilot In Command, all aircraft)		

The operator reported that the accident pilot was hired in May of 2021 and had flown the pipeline route multiple times over the previous 11 months. The pilot had accrued about 2 years of low-level pipeline patrol in similar mountainous terrain.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N314FR
Model/Series:	182S	**Aircraft Category:**	Airplane
Year of Manufacture:	1998	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	18280260
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	March 14, 2023 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	30 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	7620.8 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	C91A installed, activated, aided in locating accident	**Engine Model/Series:**	IO-540-AB1A5
Registered Owner:	HAWKEYE HELICOPTER LLC	**Rated Power:**	230 Horsepower
Operator:	HAWKEYE HELICOPTER LLC	**Operating Certificate(s) Held:**	Rotorcraft external load (133)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KCPR,5290 ft msl	**Distance from Accident Site:**	27 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	16°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	17 knots / 25 knots	**Turbulence Type Forecast/Actual:**	Unknown / Unknown
Wind Direction:	300°	**Turbulence Severity Forecast/Actual:**	Unknown / Unknown
Altimeter Setting:	29.71 inches Hg	**Temperature/Dew Point:**	6°C / -9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Evanston, WY (EVW)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	19:25 UTC	**Type of Airspace:**	Class G

The accident site was located north of a cold front, on the cool side of the front. Fronts can act as lifting mechanisms to help produce clouds and precipitation if sufficient moisture is present. No cloud cover was indicated over the accident site, with a west-east oriented cumulus cloud band in between the accident site and KCPR.

The observations from the KCPR Automated Surface Observing Systems (ASOS) around the accident time identified VFR conditions with winds gusting as high as 31 kts.

A High-Resolution Rapid Refresh (HRRR) sounding for the accident site indicated the possibility of LLWS and light clear air turbulence (CAT) between the surface and 500 ft agl.

Weather forecast information for the accident time indicated that AIRMET Tango was valid for the accident site area at the accident time. AIRMET Tango forecast moderate turbulence below 16,000 ft mean sea level (msl). In addition, archived GTG information indicated light to moderate turbulence conditions between 500 and 1,000 ft agl.

The Graphical Forecasts for Aviation (GFA) products issued by the Aviation Weather Center (AWC) before the accident flight indicated visual flight rules (VFR) conditions with a westerly wind of 10 to 15 kts gusting to 25 kts.

A search of archived information indicated that the accident pilot did not request weather information from Leidos Flight Service. A search of the ForeFlight database did not indicate any flights plans or weather briefings requested by the pilot on the day of the accident. It is

unknown what weather information, if any, the accident pilot checked or received before departure and through the time of the accident.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	42.457831,-106.64491(est)

Examination of the accident site revealed that the airplane impacted mountainous terrain about 30 miles southwest of CPR at an elevation of about 6,990 ft msl. The wreckage came to rest upright and was oriented along a northeast heading on the ridgeline/eastern slope, near the top of the mountain.

Postaccident examination of the airplane revealed no evidence of any preaccident mechanical malfunctions or failures that would have precluded normal operation.

Medical and Pathological Information

An autopsy of the pilot was performed by the Natrona County Coroner's Office, Evansville, Wyoming, which listed the cause of death as "massive blunt force injuries."

Toxicology testing performed at the FAA Forensic Sciences Laboratory was negative for all drugs tested.

Additional Information

The FAA's *Airplane Flying Handbook* (FAA-H-8083-3C) describes some environmental factors associated with mountain flying. The handbook states, in part, the following:

> *Turbulence, or a large variation in wind velocity over a short distance, can cause upset and* Loss of control in-flight (*LOC-I.) Maintain awareness of conditions that can lead to various types of turbulence, such as clear air turbulence, mountain waves, wind shear, and thunderstorms or microbursts. In addition to environmentally-induced turbulence, wake turbulence from other aircraft can lead to upset and LOC-I*.

The *Airplane Flying Handbook* defines wind shear as a sudden, drastic shift in wind speed, direction, or both that may occur in the horizontal or vertical plane.

Administrative Information

Investigator In Charge (IIC):	Gutierrez, Eric
Additional Participating Persons:	Bruce Hanson; Federal Aviation Administration; Casper, WY Troy R. Helgeson; Lycoming Engines Inc.; Williamsport, PA Casey Love; Textron Aviation Air Safety Investigation; Wichita,, KS Ernest C. Hall; Textron Aviation Air Safety Investigation; Wichita,, KS
Original Publish Date:	October 23, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=106928