



# Aviation Investigation Final Report

<b>Location:</b>	Green River, Wyoming	<b>Accident Number:</b>	WPR12FA164
<b>Date &amp; Time:</b>	April 12, 2012, 17:30 Local	<b>Registration:</b>	N32EG
<b>Aircraft:</b>	Cessna 320D	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>	Aircraft structural failure	<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The non-instrument rated pilot departed in the high-performance multiengine airplane on a cross-country flight over mountainous terrain. Mixed rain and snow showers were reported in the area, and lightning flash data and surface observations indicate vigorous snow shower activity around the time and location of the accident. Recorded radar returns believed to be associated with the accident airplane showed a radar track on a westerly heading at cruise altitudes between 10,000 and 12,000 feet mean sea level. The radar track then depicted a descending 720-degree turn over the course of several miles. Following the turn, the radar track showed multiple heading and altitude changes over the course of about 2 minutes. The last observed radar return was about 0.4 mile from the accident location. The wreckage debris was scattered over an area about 0.4 mile in length. Pieces of the cockpit and a section of the right elevator were located at the southeast perimeter of the debris field; the fuselage and both engines located at the opposite, northwest, end of the debris field. Sections of the wings, flight control surfaces and horizontal stabilizer were also scattered between the beginning of the debris field and the main wreckage.

Examination of the wing and horizontal stabilizer spars fracture surfaces showed features consistent with overstress separation in-flight and no evidence of fatigue was noted.

Given the radar track, the length of the wreckage debris field, and the marginal weather conditions, it is likely that the break-up sequence was inadvertently induced as the pilot attempted to maneuver the airplane out of marginal weather conditions, which ultimately led to an exceedence of the design stress limits of the airplane.

## 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 airplane control while maneuvering in marginal weather conditions, which resulted in an exceedence of the design stress limits of the airplane and a subsequent in-flight structural failure.

## Findings

<b>Aircraft</b>	Dynamic load - Capability exceeded
<b>Personnel issues</b>	Aircraft control - Pilot
<b>Personnel issues</b>	Decision making/judgment - Pilot
<b>Environmental issues</b>	Snow - Contributed to outcome

# Factual Information

## History of Flight

<b>Enroute-cruise</b>	Other weather encounter
<b>Maneuvering</b>	Abrupt maneuver
<b>Maneuvering</b>	Aircraft structural failure (Defining event)
<b>Uncontrolled descent</b>	Collision with terr/obj (non-CFIT)

On April 12, 2012, about 1730 mountain daylight time, a Cessna 320D, N32EG, collided with mountainous terrain following an in-flight break up and uncontrolled descent about 23 miles south of Green River, Wyoming. The private pilot, the sole occupant of the airplane, was fatally injured. The airplane was registered to Flying High Investments, and operated by the pilot as a visual flight rules (VFR) cross-country flight under the provisions of 14 Code of Federal Regulations (CFR) Part 91. Visual meteorological conditions prevailed and no flight plan was filed. The flight originated from Sidney, Nebraska (KSNY), about 1530 and the pilot's planned destination was Winnemucca, Nevada (KWMC).

On April 12, family members alerted the Federal Aviation Administration (FAA) that the pilot was overdue at his planned destination. That evening, at 2307, the FAA issued an alert notice (ALNOT) for the missing airplane. The following morning, search and rescue personnel discovered the wreckage in a remote area south of Green River. The wreckage debris field was approximately 0.4 miles in length.

Recorded radar data covering the area of the accident was supplied by the FAA. The radar data was studied using the airplane's approximate time and anticipated flight track from Sidney. The radar returns believed to be associated with the accident airplane showed a radar track on a mostly westerly heading at cruise altitudes between 10,000 and 12,000 feet mean sea level (msl). The radar track continued westerly until about 1716 hours. The track then depicted a descending 720-degree turn over the course of several miles. Following the turn, the radar track showed multiple heading and altitude changes over the course of about 2 minutes. The last observed radar return was at 17:30:08 at 11,400 feet approximately 0.4 miles from the accident location.

The distance from Sidney, Nebraska, and Winnemucca, Nevada, is about 670 miles on an initial bearing of about 270 degrees.

There are no known witnesses to the accident; however, a sheep herder in the area during the time frame of the accident reported areas of mixed rain showers.

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	65
<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>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	January 20, 2011
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	1600 hours (Total, all aircraft), 150 hours (Total, this make and model)		

The pilot, age 65, held a private pilot certificate for airplane single-engine and multi-engine land and a third-class airman medical certificate issued January 10, 2011, with the limitation that he wears corrective lenses. The pilot did not hold an instrument rating. The pilot's flight time logbook was not recovered for examination. On the pilot's January, 2011 application for his medical certificate he reported 1,600 total flight hours, with 20 hours in the 6 months preceding the application.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Cessna	<b>Registration:</b>	N32EG
<b>Model/Series:</b>	320D	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	320D0009
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	6
<b>Date/Type of Last Inspection:</b>	November 1, 2011 Annual	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	4627 Hrs as of last inspection	<b>Engine Manufacturer:</b>	CONT MOTOR
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	TSIO-520-B
<b>Registered Owner:</b>	FLYING HIGH INVESTMENTS	<b>Rated Power:</b>	260 Horsepower
<b>Operator:</b>	Cranfill High	<b>Operating Certificate(s) Held:</b>	None

The 6-place, multi-engine airplane, serial number 320D0009, was manufactured in 1965. It was powered by two Continental TSIO 520-B engines and equipped with variable pitch propellers. Review of copies of maintenance logbook records showed that the most recent annual

inspection of the airframe and both engines was completed November 1, 2011 at an airframe total time of about 4,627 hours.

### Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KRKS, 6765 ft msl	<b>Distance from Accident Site:</b>	37 Nautical Miles
<b>Observation Time:</b>	17:07 Local	<b>Direction from Accident Site:</b>	60°
<b>Lowest Cloud Condition:</b>	Few / 200 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	Broken / 5500 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	8 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	280°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.79 inches Hg	<b>Temperature/Dew Point:</b>	1°C / 0°C
<b>Precipitation and Obscuration:</b>	In the vicinity - Showers - Snow		
<b>Departure Point:</b>	Sidney, NE (KSNY)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Winnemucca, NV (KWMC)	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	15:30 Local	<b>Type of Airspace:</b>	

The closest weather facility was near Rock Springs, Wyoming (KRKS), about 37 miles northeast of the accident site. KRKS is at an elevation of 6,765 feet. The following observations were taken and disseminated during the times surrounding the accident:

At 1656 MDT, wind from 300 degrees at 10 knots, 4 miles visibility, light snow and mist, few clouds at 200 feet above ground level (agl), a broken ceiling at 1,100 feet agl, overcast skies at 2,600 feet agl, temperature 1 degree C, dew point 0 degree C, and an altimeter setting of 29.80 inches of mercury.

At 1707 MDT, wind from 280 degrees at 8 knots, 10 miles visibility, few clouds at 200 feet agl, a broken ceiling at 5,500 feet agl, overcast skies at 9,000 feet agl, temperature 1 degree C, dew point 0 degree C, and an altimeter setting of 29.80 inches of mercury.

At 1754 MDT, wind from 230 degrees at 9 knots, 10 miles visibility, few clouds at 4,000 feet agl, scattered clouds at 4,600 feet agl, an overcast ceiling at 6,000 feet agl, temperature 4 degrees C, dew point 2 degrees C, and an altimeter setting of 29.80 inches of mercury.

Additional weather information can be found in the Meteorology Weather Study located in the public docket for this accident.

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	On-ground
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	On-ground
<b>Total Injuries:</b>	1 Fatal	<b>Latitude, Longitude:</b>	41.336112,-109.821388(est)

The accident site was about 23 miles south of Green River, Wyoming. The terrain is mountainous, but relatively flat in the general vicinity of the accident site. The measured elevation at the main wreckage was about 6,345 feet.

The wreckage debris was scattered over an area estimated to be about 0.42 miles in length, on a bearing of about 300-degrees (southeast to northwest). Pieces of Plexiglass window, the emergency egress window, and a section of the right elevator were located at the far southeast perimeter of the debris field. The fuselage and both engines were located at the opposite, northwest, end of the debris field. The fuselage sustained extensive thermal damage indicative of a postimpact fire. Sections of the wings, flight control surfaces, and the horizontal stabilizer were scattered between the southeast corner of the debris field and the main wreckage.

Additional information can be located in the wreckage examination report and diagrams located in the public docket for this case file.

## Medical and Pathological Information

On April 17, 2012, an autopsy was performed on the pilot at Memorial Hospital in Rock Springs, Wyoming.

The FAA's Civil Aerospace Medical Institute performed forensic toxicology tests on specimens from the pilot with negative results.

## Tests and Research

An investigative team that consisted of investigators from NTSB, FAA and Cessna Aircraft Company convened to examine the wreckage at a private storage facility in Riverton, Wyoming. All of the separated aerodynamic surfaces exhibited fracture features consistent with overstress separation and no evidence of fatigue was noted. The examination revealed no evidence of a preaccident mechanical malfunction with the airframe that would have precluded normal operations.

The cockpit and fuselage were mostly destroyed by impact forces and a postimpact fire. The forward fuselage was crushed aft and thermal discoloration and deformation was noted. The forward cabin bulkhead sustained extensive thermal damage. The nose landing gear and oleo strut were present, however, fractured into several sections. The cockpit controls and instrumentation were extensively damaged by postimpact fire and impact forces.

## Right Wing

The right wing was found in two sections; the inboard section separated at the wing root, and the outboard section separated just outboard of the engine compartment.

The inboard section of the wing was separated at the wing root; the forward spar was fractured at right wing station 27, and the aft spar was fractured at right wing station 38. All fracture surfaces on both the forward and aft wing spars had 45 degree shear lips and exhibited fracture features consistent with overstress separation.

The outboard section of the right wing was about 8 feet in length, from about right wing station 100 to 199. The aileron remained secure to its attachment points. Evidence consistent with over travel, was noted at the aileron hinge attachment point. The aileron control cables also showed evidence consistent with overload separation. The forward spar, upper spar cap, was fractured at right wing station 90, and the lower spar cap was fractured at right wing station 100. At the separation point, the forward upper spar cap was bent down, and the lower spar cap was bent forward. The spar webbing was wrinkled at 45-degree angles. All fracture surfaces on the forward and aft wing spars showed 45-degree shear lips and exhibited fracture features consistent with overstress separation.

## Left Wing

The left wing was found in two sections; the inboard section separated near the wing root, and the outboard section separated just outboard of the engine compartment.

The left inboard section of the wing was fractured near the fuselage. The upper and lower spar caps on the forward wing spar were fractured at left wing station 20; the lower spar cap was positioned forward of the upper spar cap. All fracture surfaces on the forward and aft wing spars showed 45-degree shear lips and exhibited fracture features consistent with overstress separation.

The left outboard section of wing was about 8 feet in length, from about left wing station 90 to 199. In reference to the forward wing spar, the aft portion of the wing was bent upward just aft of the forward wing spar. The aileron separated from the wing at its attachment points. The aileron control rod was bent at a 45-degree angle about one foot from the separation point. Deformation was also noted around the aileron control rod attachment point. The aileron control cables were separated and showed evidence consistent with overload separation. The forward spar, upper spar cap, was fractured at left wing station 100, and the lower spar cap was fractured at left wing station 99. The upper spar cap was oriented aft of the lower spar cap. The spar webbing showed evidence of lateral deformation and tearing like damage. All fracture surfaces on the forward and aft wing spars showed 45-degree shear lips and exhibited fracture features consistent with overstress separation.

## Empennage

The empennage was fragmented into multiple pieces. The vertical stabilizer and rudder were attached to the tail cone bulkhead assembly; the vertical stabilizer forward spar were crushed aft towards the rear spar. Aft crushing deformation was noted to the rudder; the rudder trim was still attached. The horizontal stabilizer was separated from the aft horizontal stabilizer spar. Both the right and left elevators were separated from their attachment points and were found in multiple pieces.

The left side horizontal stabilizer was whole and bent upward with twisting throughout, most dramatic on the inboard section and least dramatic on the outboard section. The aft horizontal stabilizer spar was torn from the horizontal stabilizer and elevator at horizontal stabilizer station 48.5. Tearing was noted along the horizontal stabilizer rear spar rivet holes. The elevator was separated at the aft horizontal spar and elevator horn attachment points. The elevator was fractured into 3 sections at horizontal stabilizer stations 0, 49, and 81. Wrinkling was noted throughout the three elevator pieces. The balance weight was secured to the outboard most elevator section.

The right side horizontal stabilizer was intact; an approximate 40-degree downward bend at horizontal stabilizer station 49 was noted. The rear horizontal stabilizer spar was torn from the right horizontal stabilizer and elevator at the right horizontal stabilizer station 48.5. Tearing was noted along the aft horizontal stabilizer spar rivet holes, on the inboard portion of the right horizontal stabilizer. Wrinkling was noted throughout the horizontal stabilizer. The right elevator was separated from its attachment points and found in two pieces.

The rear horizontal stabilizer spar was separated from the tailcone and horizontal stabilizer. The upper spar cap of the left side spar was separated from the remainder of the spar; the upper spar cap was bowed downwards on both ends.

All fracture surfaces on the empennage spar caps showed 45-degree shear lips and exhibited fracture features consistent with overstress separation.

Additional information is located in the wreckage examination report and diagrams located in the public docket for this case file.



## Administrative Information

**Investigator In Charge (IIC):** Hogenson, Dennis

**Additional Participating Persons:** Bruce J Hanson; Federal Aviation Administration; Casper, WY  
Andrew Swick; Continental Motors, Inc; Mobile, AL  
Jan Smith; Cessna Aircraft; Wichita, KS

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**Investigation Class:** [Class](#)

**Note:**

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=83381>

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