Aviation Investigation Final Report

Location:	RED LODGE, Montana	**Accident Number:**	SEA97FA133
Date & Time:	June 9, 1997, 10:30 Local	**Registration:**	N206EC
Aircraft:	Cessna U206E	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The non instrument-rated pilot obtained two separate weather briefings on the late afternoon and following morning prior to departing on his intended flight from Glendive, MT, to McCall, ID. He was advised by the briefer that 'VFR flight was not recommended' due to a low pressure system in Montana along with obscurations. The flight departed Glendive; and approximately 4 hours later, the pilot radioed Great Falls AFSS looking for a VFR airport available for landing. Witnesses observed seeing the aircraft exit clouds (bases approximately 6,000 feet MSL or 800 feet AGL) and break up, with both wings separating. Weather at the site was described as 'low clouds' and 'overcast' with poor visibility. Both wing struts separated at the strut-to-fuselage attach points, and the right wing was found in two separate pieces just short of the intact left wing. Both wings impacted terrain short of the fuselage ground impact site. The wing spar carry-through channel was observed to have separated just inboard of the right wing-root to fuselage attach point. The fracture surfaces were characteristic of instantaneous overload separations. All horizontal and vertical control surfaces remained with the fuselage except the right elevator.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot-in-command's flight into known adverse weather and the subsequent overload and separation of the right wing-strut fuselage-to-strut attach point. Factors contributing were clouds and obscuration.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: CRUISE

Findings
1. (F) WEATHER CONDITION - CLOUDS
2. (C) FLIGHT INTO KNOWN ADVERSE WEATHER - ATTEMPTED - PILOT IN COMMAND
3. (F) WEATHER CONDITION - OBSCURATION

Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: DESCENT - UNCONTROLLED

Findings
4. (C) WING,BRACING STRUT - OVERLOAD
5. WING,SPAR - SEPARATION

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On June 9, 1997, approximately 1030, mountain daylight time, a Cessna U206E, N206EC, registered to Payette River Industries, Inc., and being flown by the owner, a private pilot, was destroyed during an in-flight breakup and subsequent collision with terrain following a loss of control. The pilot, front right-seat passenger (also a private pilot), and rear-seat passenger, all sustained fatal injuries. The aircraft crashed three nautical miles east of Red Lodge, Montana. Instrument meteorological conditions prevailed at the time, and no flight plan had been filed. The flight, which was personal, was to have been operated under 14CFR91, and originated from Glendive, Montana, earlier on the morning of the accident.

A caller for aircraft call sign "206EC" contacted the Great Falls Automated Flight Service Station (AFSS) approximately 1639 on June 8, 1997. The caller reported calling from Glendive, Montana, and requested a weather briefing from Glendive (GDV) to McCall, Idaho, (MYL) with an expected off time of approximately 1710. He requested a VFR flight route direct and the AFSS briefer advised that VFR flight was not recommended. During the briefing the caller was advised that the following day also looked bad. Then the briefer described a low pressure system between Sheridan, Wyoming, and Billings, Montana, with a stationary front running from Billings up to Glendive, and another stationary front running from Billings into Yellowstone Park. The briefing was terminated approximately 1650 (refer to ATTACHMENT WB-I).

A second weather briefing from the Great Falls AFSS was obtained approximately 0601 on June 9, 1997, for the same aircraft call sign. The caller again reported calling from Glendive, Montana, and again requested a weather briefing from Glendive (GDV) "direct" to McCall, Idaho, (MYL) with an expected off time of approximately 0700. He specifically requested that he would "like to go enroute (sic) ah someway or another to get to McCall, Idaho." During the briefing, the caller was advised of "occasional mountain obscuration across the south central part" (Montana), spreading "through southwestern Montana and down over to Billings." The briefer also described a "surface low over eastern Montana with a stationary front on a line northeast and southwest of that point basically going across northwestern Wyoming, southeastern Idaho, (and) northern Nevada" and further remarked that "VFR (was) not recommended in areas of obscuration." The briefer also provided information on a more northerly route via Great Falls where weather conditions were reported as better, and the caller responded stating that "my best chance would be to stay further to the north then" and the briefer responded "lot better than it did yesterday afternoon." The pilot did not file a flight plan and the briefing was terminated approximately 0607 (refer to ATTACHMENT WB-II).

The aircraft was reported to have been topped off with 47.9 gallons of fuel late on the

afternoon of June 8, 1997, and a credit card slip showed the pilot checking out of the Days Inn at Glendive, Montana, at 0609 on June 9, 1997.

At 1019:03, on the morning of the accident, the Great Falls AFSS received a radio transmission from aircraft call sign N206CE as follows: "Great Falls this is two zero six echo charlie."

At 1019:13, the AFSS air traffic control specialist responded: "aircraft calling Great Falls radio on Billings one two two point five, say again."

At 1019:20, N206EC radioed again: "(unintelligible) Great Falls, this is two oh six echo charlie, we're about forty miles south of Billings, Montana, we'd like to locate an airport (where) we can land VFR." The Salt Lake City Air Route Traffic Control Center (ARTCC) showed a radar target at the same time headed generally south at an altitude of 10,000 feet above mean sea level (MSL). This target was located at 45 degrees 25 minutes 3 seconds north latitude, and 109 degrees 23 minutes 42 seconds west longitude.

At 1019:46, the AFSS air traffic control specialist responded: "november two zero six echo charlie, Great Falls radio, ah Billings currently reporting ceiling four hundred broken, one thousand two hundred overcast, visibility one zero, ah closest VFR airport would probably be ah well even uh behind you Sheridan ah ceiling eight hundred broken, one thousand three hundred broken, one thousand niner hundred overcast, ah you'd have to go east toward ah Miles City to be able to get into VFR conditions."

At 1020:26, N206EC's final radio transmission was received as follows: "Great Falls, thank you, two zero six echo charlie" (refer to ATTACHMENT WB-III). The Salt Lake City ARTCC showed a radar target one second later continuing generally south at an altitude of 10,000 feet MSL. This target was located at 45 degrees 22 minutes 56 seconds north latitude, and 109 degrees 22 minutes 30 seconds west longitude.

The Salt Lake City ARTCC showed the above targets with additional targets from 1024:17 until 1028:46 (refer to TABLE I). These targets were observed tracking generally southbound, then turning generally eastbound over the town of Red Lodge, Montana, and then terminating within one-half mile west of the ground impact site (refer to CHARTS RD-I and II).

A close-up view of the last five radar targets showed the aircraft beginning a left turn to the northwest followed by tight right-hand spiral. The first three targets showed an altitude of 10,100 feet MSL, and the last two targets reported no altitude information. The elevation at the ground impact site was approximately 5,300 feet MSL (refer to CHART RD-III).

Three individuals observed the accident, and a fourth heard it. The lone ear-witness, who was located approximately one nautical mile southwest of the crash site, reported the following:

Witness number one was changing a radiator at Brophy Mine (refer to statement #1 and map). He reported that he heard "what sounded like a small single engine aircraft flying past"

approximately "one-half mile north" of his location. He reported that he "could hear the sound of its engine as a background noise for a couple minutes when all of a sudden the engine started reving (sic) faster & faster for about 4 or 5 seconds." He reported hearing "a big whomp noise" but "couldn't see anything."

The three eye-witnesses, who were all located within several thousand feet of the crash site, reported seeing the following:

Witness number two was situated directly underneath the aircraft as it broke up (refer to statement #2 and map). He reported he heard the "plane for roughly 30-45 seconds before (he) spotted him" and that the aircraft's engine sounded like it was racing, then it began to run rough and sputter, (and) then there was a loud pop" (the popping sound enabled the witness to visually locate the aircraft). He reported further that the aircraft's engine "quit after the pop" and that he saw "small chunks of debris falling from the front part of the plane" and that it "began to make tight circles" and "after he went around 1.5 to 2 times both wings peeled off and the fuselage plummeted to the ground." The witness ended reporting that the aircraft "appeared to stay level until (it) started to circle, and then it pitched slightly downward" and that the aircraft "was heading east, and (the) circles were to (its) left." "The clouds that day were hanging low, about 800 to 900 feet above us, and the plane was right at the bottom of the clouds."

Witness number three was situated slightly southwest of the ground impact site (refer to statement #3 and map). She reported she could hear the aircraft for about 30 seconds coming towards her and that "the weather was very overcast and visibility was very poor." She also reported that when she heard the aircraft she could not initially see it, then she "heard the plane's engine rev up a few times" and "heard a loud pop and saw a big spark" but still could not see the aircraft. She reported that "after a few seconds I could see pieces of the plane falling out of the sky." She clarified her observations reporting the she "saw pieces of small debris floating down" and then saw "the main part of the plane come down" and "then the wings came down later."

Witness number four was situated slightly northeast of the ground impact site (refer to statement #4 and map). He reported that when he first heard the aircraft it was "spitting and sputtering" and that when he first observed the aircraft "it was about .25 mile away from me headed west." He further reported that that the aircraft was flying fairly level and then the engine revved up and made a popping sound and then quit running. He also observed seeing pieces of the aircraft fall off from the front of the plane. He also reported seeing the aircraft turn "left in kind of a tight turn" while "still flying flat." He also reported that the aircraft "made about 1.5 turns (circles)" but "then, the wings fell off" "within about 2 seconds of each other."

PERSONNEL INFORMATION

The pilot-in-command's second logbook was reviewed. The log opened June 13, 1993, and the last entry logged was on May 17, 1997. All 154 flight log entries were logged in the accident

aircraft, and no simulated or actual instrument time was recorded in this log. A total of 3.1 hours of simulated time and 0.0 hours of actual instrument time was brought forward into the second log when it was opened. A page from a yellow notepad dated June 25, 1997, and containing a signoff for a bi-annual flight review (BFR), was observed stapled to the last page of the second logbook. No flight time was shown entered into his logbook for this date. A telephonic interview with the BFR instructor revealed that the flight was 1.3 hours in duration and included 0.3 hours en route "hood" time. The flight instructor also stated that she felt that the pilot-in-command "needed to fly more often." The pilot-in-command did not have an instrument rating. His most recent medical (third class) was issued November 29, 1995, and his weight at that time was reported as 260 pounds.

The pilot qualified right-seat passenger possessed a private pilot airplane single-engine land rating issued November 5, 1981. His most recent medical (third class) was issued May 14, 1993, and his weight at that time was reported as 253 pounds. His total flight experience, according to FAA records as of this medical date was 140 hours.

AIRCRAFT INFORMATION

Airframe and engine logs, along with associated aircraft paperwork, showed the aircraft (N9403G) as being transferred from Cessna Aircraft Company to its first owner in early 1971. According to NTSB records, the aircraft incurred substantial damage (including left wing and nose gear damage) in an accident on July 22, 1983, during an off airport emergency landing.

The aircraft's second airframe logbook showed major repairs in accordance with an FAA Form 337 completed on March 10, 1984, at a total airframe time of 2969 hours, and the aircraft was returned to service. This log also showed an entry stating "install IO-550F engine in this airframe per STC SA2830," "deassembled (sic) aircraft after transporting on trailer to hangar," and "right wing repaired by Aircraft Northwest - see Form 337 dated 10-15-94." It is not known what precipitated the "right wing repair" which was dated December 14, 1994, at a total airframe time of 6,982 hours.

On January 9, 1997, the FAA issued a change of registration from N9403G to N206EC. The last airframe log entry was dated February 1, 1997, at a total airframe time of 7,096 hours, and was logged as an annual inspection. On the same date, the aircraft's engine log reflected a 100 hour inspection completed at a total engine time of 115 hours since its installation on December 14, 1994. The flight time from this date (02/01/97) to the accident could not be precisely determined, however, the pilot's personal flight log showed 5 flights logged in N206EC by the owner, totaling 4.6 hours of flight time.

METEOROLOGICAL INFORMATION

Aviation surface weather observations were taken at the following locations and noted times (refer to CHART I).

GDV: Glendive, MT (2,456 MSL) at 0835 MDT MLS: Miles City, MT (2,628 MSL) at 0854 MDT BIL: Billings, MT (3,649 MSL) at 0956 and 1056 MDT LVM: Livingston, MT (4,656 MSL) at 1051 MDT COD: Cody, WY (5,098 MSL) at 1055 MDT

The reports noted in part:

GDV @ 0835: Visibility 10 miles, skies clear, temp 20C, dew point 14C.

MLS @ 0854: Visibility 20 miles, sky condition 10,000 scattered, 20,000 overcast, temp 22C, dew point 17C.

BIL @ 0956: Visibility 10 miles, sky condition 400 broken, 1,200 overcast, temp 14C, dew point 14C.

BIL @ 1056: Visibility 10 miles, sky condition 600 overcast, temp 15C, dew point 14C.

LVM @ 1051: Visibility 20 miles light rain, sky condition 5,000 broken, 7,000 overcast, temp 14C, dew point 11C.

COD @ 1055: Visibility 10 miles, sky condition 1,500 overcast, temp 16C, dew point 12C.

Refer to witness descriptions of on site weather in History of Flight section.

WRECKAGE AND IMPACT INFORMATION

The aircraft crashed in an area of moderately rolling terrain at a location three nautical miles east of Red Lodge, Montana (refer to CHART RD-II/III and attached witness topographic charts). The distribution of wreckage was spread over close to 1,000 feet horizontally along a south to north bearing line, with the fuselage (engine, cabin, and empennage) including the vertical/horizontal stabilizers, rudder and left elevator, coming to rest at the most northerly ground site (refer to DIAGRAM I and photographs 1 through 4).

Small, lightweight fragments of wreckage consisting of pieces of interior fiberglass insulation, a major section of Plexiglas windscreen (refer to photograph 5), a plastic wingtip fragment, and small fragments of aluminum aircraft skin, were located throughout the southernmost half of the wreckage distribution (refer to DIAGRAM I).

The left elevator counterweight, which had separated from its respective outboard elevator edge, was found approximately midway between these initial fragments and the fuselage ground impact site (refer DIAGRAM I and photograph 6). The aircraft's right elevator (not including the counterweight) was found approximately 250 feet west (refer to DIAGRAM I and photograph 7). A closer examination of the right elevator torque tube end revealed shearing of the rivets which attach the torque tube arm to the tube (refer to photograph 8).

The aircraft's right wing, composed of two major sections, was found a short distance north of the left elevator counterweight. The southernmost section consisted of the outboard portion of the right wing including a portion of the flap and the aileron. The tip was absent and the wing had been torn and twisted extensively (refer to photographs 9 and 10). The inboard section of the right wing was found less than 100 feet to the northeast. Its fuselage-to-wing attach strut was observed lying on the ground a few feet from the wing attach point (refer to photographs 11 and 12). A piece of nose cowl from around the engine air intake area was found less than 100 feet northeast of the strut.

The entire left wing, including its fuselage-to-wing attach strut, was observed lying on the ground further north, and approximately 250 feet southwest of the fuselage ground impact site. The strut was observed to have remained attached at the wing mid-point and an approximate three foot section of wing-spar carry-through structure remained attached at the wing root area (refer to DIAGRAM I and photographs 13 and 14).

A closer inspection of the spar carry-through unit which attaches both the left and right wings through the upper cabin area, was made on site. The carry-through remained attached to the left wing (refer to photograph 15). The outboard right end of the carry-through was observed to have separated at a point just inboard of the end of the spar block and through all three sides of the spar carry-through channel. The separation surface, which was characterized by grainy, 45 degree fracture surfaces, passed through two holes on either side of the carry-through channel. These two holes were designed to accommodate the passage of bolts through the spar carry-through channel and spar block (outboard) end. Neither bolt was located (refer to photographs 16 and 17).

The left wing strut had separated from the fuselage at its fuselage attach fitting. The separation passed through the bolt hole and the fracture surfaces were observed to be clean and grainy (refer to photographs 18 and 19). The right wing strut, which was (as described earlier) located near the inboard section of right wing, had also separated from the fuselage at its fuselage attach fitting. The separation passed through the bolt hole, and the fracture surfaces (strut end) were observed to be impacted with soil and grainy (refer to photograph 20). Both left and right struts retained their associated fuselage attach bolts.

The aircraft's Continental IO-550-F engine was examined at the site. Continuity of both the crankshaft and camshaft was verified, as was concurrent movement of the accessory pad gears (refer to photograph 21). One magneto was checked successfully and the other was damaged and could not be tested. All three propeller blades remained attached to the engine/propeller hub assembly and the blades displayed minimal bending deformation (refer to photograph 22). The vacuum pump drive coupling was found intact and the internal spool was fractured (refer to photograph 23). There was no evidence of any pre-impact control malfunction and the flap actuator was consistent with a "retracted" setting.

MEDICAL AND PATHOLOGICAL INFORMATION

Post mortem examination of the pilot-in-command was conducted by Kenneth H. Mueller, M.D., at the facilities of Pathology Associates, 1233 North 30th street, Billings, Montana, 59103, on June 10, 1997. Toxicological evaluation of samples from the pilot-in-command detected no ethanol or drugs (refer to attached Toxicology report).

ADDITIONAL INFORMATION

On-site examination of the wreckage was conducted on June 10, 1997, after which, the wreckage was verbally released to Mr. Mike Cornia. Written wreckage release, documented on NTSB Form 6120.15 (attached), was accomplished on June 17, 1997.

Pilot Information

Certificate:	Private	**Age:**	55,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	November 29, 1995
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	624 hours (Total, all aircraft), 234 hours (Total, this make and model), 571 hours (Pilot In Command, all aircraft), 3 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N206EC
Model/Series:	U206E U206E	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	U20601603
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	February 1, 1997 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	5 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	7101 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-550-F2B
Registered Owner:	PAYETTE RIVER INDUSTRIES, INC.	**Rated Power:**	300 Horsepower
Operator:	CHENEY, ERNEST, J.	**Operating Certificate(s) Held:**	None
Operator Does Business As:	PAYETTE RIVER INDUSTRIES, INC.	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BIL ,3649 ft msl	**Distance from Accident Site:**	
Observation Time:	10:56 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Unknown	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 600 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	15°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	GLENDIVE , MT (GDV)	**Type of Flight Plan Filed:**	None
Destination:	MCCALL , ID (MYL)	**Type of Clearance:**	None
Departure Time:	08:40 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Fatal	**Latitude, Longitude:**	45.189807,-109.24002(est)

Administrative Information

Investigator In Charge (IIC):	Mccreary, Steven
Additional Participating Persons:	MAXINE DYER; HELENA , MT JOHN HUY; WICHITA , KS JOHN T KENT; SEAGOVILLE , TX
Original Publish Date:	February 28, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=42505