Aviation Investigation Final Report

Location:	TENNANT, California	**Accident Number:**	LAX96FA275
Date & Time:	July 17, 1996, 14:15 Local	**Registration:**	N9324P
Aircraft:	Piper PA-24-260	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot departed San Jose, California, on a cross-country flight to Sisters, Oregon. He obtained a standard preflight weather briefing. Visual flight was not recommended. Cumulus buildups were reported to the pilot. The pilot indicated that he may be overflying the cloud tops. He did not file a flight plan. The pilot's wife was driving to the same location and they talked by cell phone while en route. When the pilot failed to arrive at the destination a search was started. According to radar data, the aircraft was at 15,400 feet when it started a rapid descent. Radar was lost at 11,800 feet. Witnesses reported seeing the aircraft descending near vertically out of broken clouds with the engine at full power. When the aircraft was found, the right outboard wing panel from about station 110 outboard was missing. About a month later the outer wing panel was found. Analysis of the failed structure indicated a positive overload of the wing and the horizontal stabilators.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's continued flight into known adverse weather conditions.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: CRUISE

Findings

1. (F) WEATHER CONDITION - TURBULENCE
2. (F) WEATHER CONDITION - CLOUDS
3. (C) FLIGHT INTO KNOWN ADVERSE WEATHER - CONTINUED - PILOT IN COMMAND

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

Findings
4. WING - OVERLOAD

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

Factual Information

HISTORY OF FLIGHT

On July 17, 1996, about 1415 hours Pacific daylight time, a Piper PA-24-260, N9324P, was destroyed after an uncontrolled descent into terrain near Tennant, California. The pilot and passenger were fatally injured. Marginal visual meteorological conditions had been forecast along the pilot's route of flight and no flight plan was filed. The flight originated at San Jose, California, about 1230 on the day of the accident and was destined for Sisters, Oregon.

The pilot's wife was driving to the same location. They talked by cell phone while en route. When the pilot failed to arrive at the destination a search was started.

According to recorded radar data, the aircraft was observed at 15,400 feet msl, at which time it started a descent. About 1 minute later it was lost from radar at 11,800 feet msl. There were three witnesses that observed the aircraft descending into the general area of the accident site. Two witnesses stated that it was descending vertically out of the clouds, and one said it was descending at a 45-degree angle with a loud engine sound. The witnesses reported that there were breaks in the overcast with bases about 3,000 feet above ground level.

PERSONNEL INFORMATION

The pilot's flight logbook was not recovered. According to the pilot's last third-class flight physical which was conducted on July 29, 1994, he had accumulated 2,800 total flight hours with 86 hours in the last 6 months.

AIRCRAFT INFORMATION

At the time of the accident the aircraft had accumulated about 4,229 total flight hours according to an examination of the airframe logbook. The last documented annual inspection was performed on March 8, 1996. At that time, the aircraft had a total flight time of 4,192 hours with 1,007 hours since an engine major overhaul. During the wreckage examination the recording tachometer indicated 3,509.27 hours. The aircraft had flown about 37 hours since the last annual inspection.

METEOROLOGICAL INFORMATION

The pilot called for and received a preflight weather briefing from OAK AFSS from San Jose, California, to Bend, Oregon. The pilot received a standard briefing and was advised that VFR was not recommended.

The pilot contacted the Oakland En Route Flight Advisory Service (EFAS) while he was over Red Bluff, California. He requested the weather to Klamath Falls, Oregon, and was advised that there were no flight advisories. He was informed that the clouds over the Siskiyou mountains were 7,000 feet broken with some cumulus buildups. The Klamath Falls weather was given as a few clouds at 4,000 feet and scattered clouds at 8,000 and 18,000 feet.

Satellite data indicated cumulus buildups in the area of Klamath Falls, with precipitation north. There were no pilot reports available. The pilot was advised of the cumulus buildups. The pilot stated to the briefer that he may be going over them. The briefer said that their may be higher en route buildups. The Redmond, Oregon, weather was given as 8,000 and 9,000 foot broken clouds. The terminal forecast for Redmond for 1800 local time was: 6,000 feet broken clouds; 10,000 feet overcast clouds; with occasional rain and possible thunderstorms.

The pilot was provided with a pilot report over The Dalles, Oregon. A Cessna 172 reported moderate turbulence at 5,000 and 8,000 feet.

The winds aloft data indicated that winds at 14,000 to 15,000 feet in the Tennant area were likely about 220 degrees at 50 knots around the accident time. Mt. Shasta (14,162 feet msl) is located about 13 to 15 nautical miles downwind of the accident area.

The National Weather Service (NWS) Surface Analysis chart for 1400 hours indicated a moderate cold front extending southward from eastern Washington through eastern Oregon, and then curving southwestward through northern California. The map showed generally visual meteorological conditions (VMC) south and east of the front. The chart showed most stations north and west of the front reporting marginal VMC and light rain.

WRECKAGE AND IMPACT INFORMATION

Examination of site photographs, wreckage distribution diagrams, and interviews of FAA personnel present were used to describe the accident site. The accident site is on a forested level plain about 4,800 feet msl, and is populated by 30-foot pine trees and scrub brush. An initial ground disturbance was noted just south of a 30-foot-tall pine tree consisting of two crater-like depressions on a magnetic bearing of 171 degrees and separated by a 4-foot distance. The first crater was small and shallow, while the second was about 2 feet by 3 feet deep in diameter.

The propeller assembly was found just south of the second crater and was separated from the engine crankshaft flange. One blade remained attached to the hub. The second blade was fractured and separated at the shank just outboard of the hub. Minor leading edge damage, chordwise scoring, and tip end twist deformation was observed.

A trail of debris and ground scars was observed leading from the second crater on a magnetic bearing of 159 degrees to the main wreckage. The debris field between the crater and wreckage contained left wing components, left aileron, and it's associated balance weight/bell

crank assembly.

The entire aircraft sustained accordioning crush from the nose cone to the tail cone, with extensive fragmentation noted to all components. The remains of the left and right wings were found on the west side of the wreckage. Approximately 75 inches of the outboard right wing and it's associated aileron, the aileron balance weight and bell crank assembly were not located. An area encompassing a radius of 100 yards from the main wreckage was examined for components with none found.

The wreckage was recovered from the site and examined at Plain Parts in Pleasant Grove, California, on August 7 and 8, 1996. During the examination, the wreckage was schematically reconstructed. All structural and skin wreckage components were positively matched to their location on the aircraft structure. Following the reconstruction, no components from the outboard 75-inch right wing section were found.

No oxygen system components of any kind were observed in the wreckage. The cockpit and cabin were fragmented and destroyed. The fuel selector was located and found in the detent for the left main tank position. The cabin heater, defroster, and right side air vents were found off; the left side air vent was destroyed. The throttle quadrant was crushed and separated from the instrument panel; the throttle, propeller, and mixture controls were full aft. The control system components behind the instrument panel and under the cabin floor were examined with no unusual operating condition noted.

The cabin door was separated from its hinges. The door locking handle was found in the closed-locked position. The door bolt and upper latching pins and hook were found in the extended positions and were bent and distorted. The corresponding door frame pin sleeve, hook recess pin, and bolt receptacle were observed to be distorted.

The fuselage aft of the cabin to the vertical stabilizer leading edge and the empennage was distorted and fragmented. No unusual condition was observed to any control system components in these sections.

The crushed and distorted vertical stabilizer remained attached to the empennage. The rudder remained attached to it's associated hinge and hangar assembly, with a distortion pattern matching the vertical stabilizer. The rudder balance weight was present on the structure. The rudder cables remained attached to the rudder bell crank, with no battering observed to the limit stops.

The right horizontal stabilizer separated from it's torque tube, but was found adjacent to the empennage at the accident site. Leading edge accordioning signatures were observed to the outboard half and were oriented 30 degrees to the leading edge.

The left horizontal stabilizer was attached to its torque tube. The leading edge outboard tip was deformed tip-end up and aft to about a 30-degree angle with the horizontal, with 45-degree

folds noted on the upper stabilizer skin surface. Minor leading edge damage was observed. No battering signatures were observed on either stabilizer control limit stop bolt head. Both wings sustained chordwise crush deformation from the leading edge to trailing edge, with massive fragmentation and disruption noted to the left wing. The main carry through fuselage spar was fractured at the center point.

LEFT WING

The left wing was extensively fragmented and disrupted over its entire span. Following reconstruction, elements of the wing were found encompassing the structure from the root rib to the tip cap. The aileron and its associated balance weight were identified. No unusual battering signatures were noted to the aileron bell crank limit stops.

The diagram in attachment 10.00 of this report denotes the fragmentation pattern to the wing:

* The section aft of the main spar and outboard to about 65 inches from the root rib (containing landing gear wheel well) was separated from the spar, with either rivets pulled through the skin or sheared. The flap was crushed in a span wise direction and remained attached to one hinge.

* The two leading edge sections encompassing the main and auxiliary fuel cell bays were crushed, separated, and exhibited hydraulic rupture signatures.

* The sections forward and aft of the main spar over a span wise distance from 65 to 110 inches from the root rib sustained fragmentation. Both upper and lower spar caps in this area were broken into several smaller sections.

* The outboard 75 inches of the wing was in one piece and sustained chordwise crushing on the inboard end. The aileron was separated from it's respective hinge points and identified on the basis of skin/rivet patterns and hinge point deformation patterns. The balance weight and associated bell crank assembly found in the wreckage distribution path was matched to this side on the basis of drawings supplied by Piper. No unusual signatures were noted on the control limit stops. The aileron cables exhibited overload signatures.

RIGHT WING

Following reconstruction of the aircraft and accounting for all wreckage pieces present, no elements of the wing outboard of 110 inches from the root rib were found.

The aileron, it's associated mass balance, and the bell crank assembly were not identified. The aileron control cables exhibited tension overload signatures at a dimensional point corresponding to the bell crank attach point.

The same diagram as above denotes the fragmentation pattern to the wing:

* The section aft of the main spar and outboard to about 110 inches from the root rib (containing landing gear wheel well) was attached to the upper and lower spar caps. The flap exhibited minor compression in a span wise direction and remained attached to one hinge.

* The two leading edge sections encompassing the main and auxiliary fuel cell bays were crushed, separated, and exhibited hydraulic rupture signatures.

* The section forward of the main spar over a span wise distance from 65 to 110 inches from the root rib separated from the spar caps with rivet shear or skin pull-through evident.

The 110-inch point from the root rib is the production splice area where the spar caps narrow. Both spar cap fractures, and the surrounding rib webs, contained impacted dirt in contrast with the clean condition of any other fracture/separations on the left wing. The spar cap fractures were bent in a wing tip leading edge up and aft direction. The lower cap fracture exhibited principally tension characteristics, while the upper cap displayed compression signatures.

ENGINE AND PROPELLER

Review of Piper delivery documents revealed that the engine and propeller were original factory installations at time of aircraft production in May, 1969. No maintenance records were located in the wreckage and the total time/overhaul history of the components are unknown. The recording tachometer was recovered with a rpm reading of 2650 and a time of 3,509.27 hours.

The engine case was extensively fragmented and the engine could not be rotated to establish pre-teardown internal continuity or mag timing. Complete disassembly revealed no unusual preimpact operating condition. The spark plugs (REM 40E) had normal gaps and were of mid-to-low time. Both mags sparked in proper firing sequence with hand rotation. The injectors were clear.

MEDICAL AND PATHOLOGICAL INFORMATION

On July 20, 1996, the Siskiyou County coroner performed an autopsy on the pilot. Limited samples were obtained from the pilot for toxicological analysis by the FAA Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma. According to CAMI the samples were unsuitable for analysis.

TESTING AND RESEARCH INFORMATION

The right wing main spar was found severed at about 110 inches outboard of the right wing root. The inboard main spars severed portion was removed and sent to the Safety Board Materials Testing Laboratory for metallurgical analysis. According to the laboratory report, the fracture surfaces showed over stress separation fractures on the flanges of the spar caps. No

indications of preexisting cracking were found. At the time of the wreckage retrieval, the outboard right wing panel section at the separation point had not been found. Subsequently, it was found a month later about 1 mile east of the accident site.

Previous airframe damage was researched. There were no FAA Form 337's relating to major repairs archived in the FAA data system in Oklahoma City. The damage type repairs to the airframe that were documented in the airframe logbooks had been done by FAA approved repair stations for the fuselage areas. There were no indications of repairs or modifications to the wing structure.

ADDITIONAL INFORMATION

The wreckage was released to the insurance company representative on January 27, 1997.

Pilot Information

Certificate:	Private	**Age:**	46,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	July 29, 1994
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	2800 hours (Total, all aircraft), 43 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N9324P
Model/Series:	PA-24-260 PA-24-260	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-4821
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	March 8, 1996 Annual	**Certified Max Gross Wt.:**	3200 lbs
Time Since Last Inspection:	37 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4229 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-540-N1A5
Registered Owner:	KIMBERLY J. LEALE	**Rated Power:**	260 Horsepower
Operator:	LEROY M. LEALE	**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	RBL ,349 ft msl	**Distance from Accident Site:**	125 Nautical Miles
Observation Time:	12:56 Local	**Direction from Accident Site:**	180°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	27°C / 12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	REID HILLVIEW , CA (RHV)	**Type of Flight Plan Filed:**	None
Destination:	SISTER , OR (6K5)	**Type of Clearance:**	None
Departure Time:	12:37 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:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	41.889598,-121.740386(est)

Administrative Information

Investigator In Charge (IIC):	Petterson, George
Additional Participating Persons:	DAVE SMITH; SACRAMENTO , CA CHARLES R LITTLE; VERO BEACH , FL MARK W PLATT; WILLIAMSPORT , PA
Original Publish Date:	October 14, 1997
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=29285