



National Transportation Safety Board Aviation Accident Final Report

Location:	Broomfield, CO	Accident Number:	CEN10TA355
Date & Time:	06/26/2010, 1300 MDT	Registration:	N1386C
Aircraft:	LOCKHEED P2V-5	Aircraft Damage:	Substantial
Defining Event:	Sys/Comp malf/fail (non-power)	Injuries:	2 None
Flight Conducted Under:	Public Aircraft		

Analysis

The airplane was returning from a retardant drop on a forest fire when the crew noted that the airplane's main hydraulic system had failed. They configured the airplane using the emergency systems and declared an emergency. After landing on the runway, the pilot elected to exit the runway using the high-speed taxiway that went to the tanker base ramp. When he tried to stop the airplane using the emergency system brakes, there was no braking response. The airplane crossed the tanker ramp, exited the prepared surface, and went through the airport perimeter fence, down an embankment, and onto a road. According to the airplane flight manual, the procedure for a hydraulic system failure is to land and stop on the runway using the emergency brake and accumulator pressure. A postaccident examination of the airplane's hydraulic system showed a rupture in the line that interconnects the main hydraulic system and retardant tank system. No other systems anomalies were found. The crew later reported that when the co-pilot lowered the nose gear using the emergency gear extension system, she did not return the emergency nose gear extension system selector to the "neutral" position, and it remained in the "bypass" position. This shut off the emergency system hydraulic system pressure to the elevator flight control and emergency brakes.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to follow published emergency procedures by taxiing to the parking ramp with a known hydraulic system failure. Contributing to the accident was the co-pilot's improper selection of the bypass position on the emergency nose gear extension system, which shut off emergency hydraulic system pressure to the brakes, and a ruptured hydraulic line, which resulted in a total loss of the main hydraulic system pressure.

Findings

Aircraft	Hydraulic, main system - Failure (Factor) Hydraulic, main system - Not specified (Factor) Nose/tail landing gear - Incorrect use/operation (Factor) Brake - Not specified
Personnel issues	Incorrect action performance - Pilot (Cause) Use of policy/procedure - Pilot (Cause) Use of policy/procedure - Copilot (Factor)

Factual Information

On June 26, 2010, about 1300 mountain daylight time, a Lockheed P2V-5 airplane, N1386C, was substantially damaged during a landing roll overrun at the Rocky Mountain Metropolitan Airport (BJC), in Broomfield, Colorado. The pilot and co-pilot were not injured. The airplane was registered to Neptune Aviation Services Inc., of Missoula, Montana, and operated by the United States Department of Agriculture (USDA), Forestry Service, under an exclusive public-use firefighting contract. Visual meteorological conditions prevailed and a company flight plan was filed for the fire suppression flight. The local flight originated from BJC at 1150.

According to the pilot, following a “normal” retardant drop, the main hydraulic system failed. The airplane was configured for landing via emergency hydraulic pressure and an emergency declared. The pilot continued, that the landing was routine; however, when he attempted to stop the airplane using the emergency system brakes there was no response. The airplane went through a fence, down an embankment, and came to rest nose down on a city street. The pilot and co-pilot were able to exit unassisted through the airplane’s upper hatches.

The airplane had landed on runway 29R. The pilot exited the runway via taxiway A13. The airplane proceeded across taxiway A, through a grassy area between taxiway A and the tanker base ramp, and across the northwest portion of the tanker base ramp. The airplane then went off the prepared surface through the airport perimeter fence where it went down the embankment and came to rest on the north side of Network Parkway. Pieces of the perimeter fence were found in the parking lot of an adjacent office complex. One piece of the fence went through an office window.

A postaccident examination of the airplane showed the nose gear broken aft and upward crushing and bending of bulkheads and walls in the nosewheel well and underside of the nose structure. The Plexiglas nose dome window was broken out. One of the four propeller blades on the right engine was bent aft. All four of the propeller blades on the left engine were broken off near mid-span. There was also fire damage observed to the outer side of the left engine nacelle just behind the ring cowling.

Further examination of the airplane’s hydraulic system showed a rupture in the line from the main hydraulic and tank system. No other systems anomalies were found.

The USDA Forest Service reported that while returning to the airport, the pilot briefed the co-pilot about the proper procedures to lower the gear. The co-pilot referred to the emergency procedures checklist and went to the spar area to operate the emergency gear extension systems. The nose gear down select was activated and the gear dropped. The co-pilot then pinned the gear in the down position and moved the emergency nose gear extension system selector to the “bypass” position, which cut off emergency system hydraulic system pressure to the elevator flight control and emergency brakes. The airplane flight manual specifies the selector be placed back to the “normal” position. The co-pilot then made an unsuccessful try to lower the main gear by releasing the up-lock lever, but on the second try the gear came down. The pilot noticed all three landing gear indicators showed the gear was safely down and locked and reported this to the tower.

The pilot briefed the tower that they would not have nose wheel steering but would try to take the high speed taxiway (A-13) off the runway near the tanker base. They received clearance to land and to make a right turn when able to exit the runway.

After touchdown, the airplane was slowed using reverse thrust on the propellers and steered using differential braking. A hydraulic accumulator supplies enough pressure to the brakes to allow for a few applications in the event of a loss of system pressure. The pilot felt he had adequate directional control and could make the right turn at A13 using the remaining emergency braking system to stop the airplane in the dirt prior to the tanker base ramp. The pilot made the turn off the runway and taxied toward the ramp. As they approached the end of the taxiway, the pilot applied the emergency brake with no result. He checked to see that he had the right lever and reapplied, again with no result. He then told the co-pilot they had no brakes and were going to wreck.

According to the airplane flight manual the procedure for hydraulic failure is to land and stop on the runway using the emergency brake and accumulator pressure. After stopping, the stiff-knee pins are to be installed and the airplane is to be towed to parking.

History of Flight

Enroute	Sys/Comp malf/fail (non-power) (Defining event)
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Pilot Information

Certificate:	Airline Transport	Age:	66, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Glider; Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Glider; Instrument Airplane	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last Medical Exam:	03/31/2010
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	03/10/2010
Flight Time:	14500 hours (Total, all aircraft), 3000 hours (Total, this make and model), 1400 hours (Pilot In Command, all aircraft), 80 hours (Last 90 days, all aircraft), 40 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Airline Transport; Commercial	Age:	52, Female
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	No
Medical Certification:	Class 1 With Waivers/Limitations	Last Medical Exam:	04/15/2010
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	04/01/2009
Flight Time:	5950 hours (Total, all aircraft), 127 hours (Total, this make and model), 5800 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	LOCKHEED	Registration:	N1386C
Model/Series:	P2V-5	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Experimental	Serial Number:	128422
Landing Gear Type:	Retractable -	Seats:	2
Date/Type of Last Inspection:	03/15/2010, AAIP	Certified Max Gross Wt.:	80000 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:	6610 Hours	Engine Manufacturer:	WRIGHT
ELT:	Installed, not activated	Engine Model/Series:	R3350 SERIES
Registered Owner:	NEPTUNE AVIATION SERVICES INC	Rated Power:	2200 hp
Operator:	(USDA) Forestry Service	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:		Observation Time:	
Distance from Accident Site:		Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:		Visibility (RVR):	
Altimeter Setting:		Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Broomfield, CO (BJC)	Type of Flight Plan Filed:	Company VFR
Destination:	Broomfield, CO (BJC)	Type of Clearance:	None
Departure Time:	1150 MDT	Type of Airspace:	

Airport Information

Airport:	Rocky Mountain Metropolitan (BJC)	Runway Surface Type:	Asphalt
Airport Elevation:		Runway Surface Condition:	Dry
Runway Used:	29R	IFR Approach:	None
Runway Length/Width:	9000 ft / 100 ft	VFR Approach/Landing:	Unknown

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	39.908611, -105.117222 (est)

Administrative Information

Investigator In Charge (IIC):	Timothy LeBaron	Adopted Date:	06/28/2012
Additional Participating Persons:	Brent Weckwerth; Federal Aviation Administration; Denver, CO Gary E Morgan; USDA Forest Service; Washington, DC Tommy Rodman-Kershner; Neptune Aviation Services, Inc.; Missoula, MT		
Publish Date:	06/28/2012		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=76470		

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