Aviation Investigation Final Report

Location:	Wenatchee, Washington	**Accident Number:**	WPR14FA310
Date & Time:	July 23, 2014, 14:18 Local	**Registration:**	N949FM
Aircraft:	Bell 206A	**Aircraft Damage:**	Substantial
Defining Event:	Hard landing	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Aerial application		

Analysis

The commercial pilot was drying cherry trees, which called for low-level flying in the helicopter. The landing area was slightly uphill with the ground tilted slightly to the right. Although the pilot had taken off and landed in that location at least once earlier in the day, wreckage documentation and ground scars revealed that, during the accident landing, the helicopter landed hard enough and with sufficient lateral motion to cause a dynamic rollover. No witnesses visually observed the accident; however, one witness heard the helicopter, followed by a thud and then silence. This witness responded to the accident and observed the helicopter on its side and smoking. Postaccident examination of the airframe and engine revealed no evidence of mechanical failures or malfunctions that would have precluded normal operation.

Results of toxicology testing for the pilot detected therapeutic levels of tramadol, which is not known to undergo significant postmortem redistribution. Therefore, the identified levels likely represented his antemortem level of tramadol. Although with regular use people can develop a tolerance to the impairing effects of opioids, in this case, the pilot was engaging in a high workload and high risk portion of flight, and even a small level of impairment could have contributed to his inability to safely land the helicopter.

The Federal Aviation Administration recommends that pilots using sedating medications on an occasional basis wait five maximum dosing intervals before flight. For tramadol that computes to waiting 40 hours (8 hours x 5) before flying; this pilot's therapeutic level suggests that he did not follow this recommendation. The pilot's impairment by tramadol likely contributed to the accident.

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 a proper decent rate and path, which resulted in a hard landing and dynamic rollover. Contributing to the accident was the pilot's impairment by a sedating medication.

Findings

Aircraft	Descent/approach/glide path - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Personnel issues	Prescription medication - Pilot

Factual Information

History of Flight

Landing-flare/touchdown	Hard landing (Defining event)

On July 23, 2014, about 1418 Pacific daylight time, a Bell 206A, N949FM, landed hard and rolled onto its right side near Wenatchee, Washington. Applebee Aviation was operating the helicopter under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91 for the cherry tree drying operation. The commercial pilot sustained fatal injuries. The helicopter sustained substantial damage during the accident sequence. The local flight departed at an undetermined time. Visual meteorological conditions (VMC) prevailed, and no flight plan had been filed.

No witnesses visually observed the accident. An ear witness heard the helicopter, and then a thud followed by silence. This witness and her spouse responded to the site, and observed the helicopter on its side and smoking. Other personnel arrived; they applied several fire extinguishers to the smoking area at the back of the engine, and the smoking stopped.

Pilot Information

Certificate:	Commercial	**Age:**	40,Male
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	June 30, 2014
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	June 23, 2014
Flight Time:	237 hours (Total, all aircraft), 13 hours (Total, this make and model), 136 hours (Pilot In Command, all aircraft), 12 hours (Last 30 days, all aircraft)		

The operator reported that the 40-year-old pilot held a commercial pilot certificate with a rating for rotorcraft-helicopter. The pilot held a second-class medical certificate issued on June 30, 2014, with no limitations or waivers.

An examination of the pilot's logbook indicated an estimated total flight time of 237 hours as of the last entry on July 15, 2014. He logged 12 hours in the previous 30 days, and had an estimated 13.2 hours in this make and model. The pilot's first logged entry was July 13, 2004. The logbook indicated 121.7 hours in an R22, and 76.8 hours in a Hughes 269A. He completed a flight check for the commercial pilot certificate on June 23, 2014.

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N949FM
Model/Series:	206A	**Aircraft Category:**	Helicopter
Year of Manufacture:	1967	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	87
Landing Gear Type:	N/A; Skid	**Seats:**	5
Date/Type of Last Inspection:	April 22, 2014 Annual	**Certified Max Gross Wt.:**	3000 lbs
Time Since Last Inspection:		**Engines:**	1 Turbo shaft
Airframe Total Time:	9607 Hrs as of last inspection	**Engine Manufacturer:**	ALLISON
ELT:	Installed	**Engine Model/Series:**	250 C18B
Registered Owner:	Applebee Aviation	**Rated Power:**	317 Horsepower
Operator:	Applebee Aviation	**Operating Certificate(s) Held:**	None

The helicopter was a Bell 206A, serial number 87. The operator reported that the helicopter had a total airframe time of 9,607 hours at the most recent annual inspection on April 22, 2014.

The engine was a Rolls-Royce Allison, serial number CAE800363B. Total time recorded on the engine at the most recent annual inspection was 3,919 hours, and time since major overhaul was 538 hours.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KEAT	**Distance from Accident Site:**	
Observation Time:	13:55 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 4900 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	320°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.9 inches Hg	**Temperature/Dew Point:**	22°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Wenatchee, WA	**Type of Flight Plan Filed:**	Unknown
Destination:	Wenatchee, WA	**Type of Clearance:**	None
Departure Time:	11:15 Local	**Type of Airspace:**	

An aviation routine weather report (METAR) for Wenatchee (KEAT), elevation 1,249 feet, 16 nautical miles (nm) southeast of the accident site, was issued at 1355 PDT. It stated: wind from 320 degrees at 11 knots; visibility 10 miles; sky 4,900 feet broken, 6,500 feet overcast;

temperature 22/72 degrees C/F; dew point 14/57 degrees C/F; altimeter 39.91 inches of mercury.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	47.622776,-120.423889(est)

The National Transportation Safety Board investigator-in-charge (IIC) and a Federal Aviation Administration (FAA) inspector examined the wreckage on site. Detailed examination notes are in the public docket for this accident, and accessible via a link on the ntsb.gov home page.

The helicopter was on its right side; the landing zone (LZ) was a grassy area that sloped in two directions. As the helicopter would approach to land from the left, there was a gradual downhill slope that was left to right and tail to nose.

The back section of the skids was more damaged than the front. The back right cross member separated at the connection of the skid; the back left cross member partially separated at the connection with the skid. There was a ground scar about 1-foot prior to the right skid in the direction of flight that was several feet long and parallel to the right skid.

The left horizontal stabilator was touching the ground, exhibited crush damage, and was bent down; there was a ground scar about 15 inches long leading to it. The right horizontal stabilator was pointing up, and was not damaged.

The vertical stabilators were in a horizontal position. The bottom of the vertical stabilator and stinger were not damaged. The top of the vertical stabilator was damaged, and bent about 50 degrees to the left.

All servos were damaged with multiple jagged and angular separations.

Recovery personnel obtained about 25 gallons of clean clear fluid from the fuel tank that smelled like jet fuel.

Medical and Pathological Information

A postmortem examination was conducted by the Chelan County Coroner's Office. The cause of death was reported as the effect of blunt force injuries to the head.

Toxicological tests on specimens recovered from the pilot were performed by the FAA Civil Aerospace Medical Institute (CAMI) Forensic Toxicology Research Team, Oklahoma City, Oklahoma. Their analysis revealed no findings for carbon monoxide or volatiles. They did not perform tests for cyanide.

The report contained the following findings for tested drugs: 0.028 (ug/ml, ug/g) O-Desmethyltramadol detected in blood, O-Desmethyltramadol detected in urine, 1.117 (ug/ml, ug/g) Tramadol detected in urine, and 0.139 (ug/ml, ug/g) Tramadol detected in blood.

An NTSB medical officer reviewed the autopsy and toxicology findings, and prepared a factual report, which is part of the public docket for this accident.

Tramadol is an opioid analgesic Schedule IV controlled substance available by prescription, often marketed with the name Ultram. Therapeutic levels are considered between 0.05 ug/ml and 0.50 ug/ml. Tramadol carries the following warning: may impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g., driving, operating heavy machinery). Tramadol is also associated with an increase in the risk of seizures, particularly soon after initiation of treatment, doses are increased, or when high doses are used. The seizure warning reads, "Seizures have been reported in patients receiving Tramadol hydrochloride within the recommended dosage range. Spontaneous post-marketing reports indicate that seizure risk is increased with doses of Tramadol hydrochloride above the recommended range.

Tests and Research

Investigators examined the wreckage at a facility provided by the operator on July 30, 2014. Detailed examination notes are in the public docket for this accident.

The airframe and engine were examined with no mechanical anomalies identified.

Administrative Information

Investigator In Charge (IIC):	Plagens, Howard
Additional Participating Persons:	Monty Coordes; FAA FSDO; Spokane, WA Jack Johnson; Rolls-Royce; Indianapolis, IN Mark Stuntzner; Bell Helicopter; Fort Worth, TX
Original Publish Date:	August 31, 2016
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89724