National Transportation Safety Board
Aviation Accident Final Report

Location:	Valley Falls, KS	**Accident Number:**	CEN12LA267
Date & Time:	05/02/2012, 0920 CDT	**Registration:**	N85RB
Aircraft:	BELL 206B	**Aircraft Damage:**	Substantial
Defining Event:	Loss of tail rotor effectiveness	**Injuries:**	3 Minor
Flight Conducted Under:	Part 91: General Aviation - Aerial Observation		

Analysis

The helicopter, with the pilot and two passengers aboard, was hovering about 100 to 150 feet above ground level with a quartering tailwind. As the pilot turned the helicopter to the right, the helicopter started to spin, as reported by the pilot and several witnesses. He applied full left pedal and left forward cyclic, and slightly reduced power to stop the rotation. The pilot added that he sensed the loss of tail rotor effectiveness (LTE) and continued with the control inputs to fly out of the LTE. The pilot was unable to regain control of the helicopter before it impacted the ground. The pilot reported no preimpact mechanical malfunctions or failures with the helicopter that would have precluded normal operation. Based on the flight conditions at the time, the accident sequence is consistent with the helicopter encountering a LTE event.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate compensation for the wind conditions during a hover maneuver, which resulted in a loss of tail rotor effectiveness.

Findings

Aircraft	Prop/rotor parameters - Not attained/maintained (Cause)
Personnel issues	Aircraft control - Pilot (Cause)
Environmental issues	Tailwind - Not specified

Factual Information

On May 2, 2012, about 0920 central daylight time, a Bell 206B Helicopter, N85RB, impacted terrain following a loss of control, near Valley Falls, Kansas. The commercial rated pilot and two passengers received minor injuries. The helicopter sustained substantial damage. The helicopter was registered to a private individual and operated by Hawkeye Helicopters, Ottawa, KS. Day visual meteorological conditions prevailed and no flight plan was filed for the 14 Code of Federal Regulations Part 91 aerial observation flight.

Several witnesses reported the helicopter “spinning” before the crash. The helicopter impacted the ground near a footpath, with trees on either side of the path. The helicopter came to rest on its left side, with the tailboom and left skid separated from the fuselage. The pilot stated that the engine continued to run for a brief time after the accident.

The pilot reported that during a 100-150 agl (above ground level) hover, the helicopter started an uncommanded right turn. He applied left full pedal, left-forward cyclic, and a slight reduction of power, to stop the rotation. The pilot added that he sensed the loss of tailrotor effectiveness (LTE), and continued with the control inputs to fly out of the LTE. Unable to get the helicopter to stop rotating, the pilot elected to enter an autorotation aiming for an open area, between a row of trees.

The responding Federal Aviation Administration (FAA) inspector stated that the pilot reported that during an out-of-ground hover, the helicopter had a quartering tailwind. The pilot initiated a right turn and the helicopter started to spin. The inspector added that the accident pilot had recently received his rotorcraft-helicopter rating based on prior military experience; however, the pilot did not have much recent helicopter experience. On the NTSB Pilot/Operator Aircraft Accident/Incident Report, 6120.1 form, the pilot reported a total of 2,398 flight hours in rotorcraft, with 2.1 hours in the accident make/model of helicopter.

FAA Advisory Circular (AC) 90-95, Unanticipated Right Yaw in Helicopters, dated February 26, 1995 states that the loss of tail rotor effectiveness (LTE) is a critical, low-speed aerodynamic flight characteristic which could result in an uncommanded rapid yaw rate which does not subside of its own accord and, if not corrected, could result in the loss of aircraft control. It also states, "LTE is not related to a maintenance malfunction and may occur in varying degrees in all single main rotor helicopters at airspeeds less than 30 knots."

Paragraph 6 of the AC covered conditions under which LTE may occur. It states:

"Any maneuver which requires the pilot to operate in a high-power, low-airspeed environment with a left crosswind or tailwind creates an environment where unanticipated right yaw may occur."

Paragraph 9 of the AC states: "When maneuvering between hover and 30 knots: (1) Avoid tailwinds. If loss of translational lift occurs, it will result in an increased high power demand and an additional anti-torque requirement. (2) Avoid out of ground effect (OGE) hover and high power demand situations, such as low-speed downwind turns. (3) Be especially aware of wind direction and velocity when hovering in winds of about 8-12 knots (especially OGE). There are no strong indicators to the pilot of a reduction of translation lift. (4) Be aware that if

considerable amount of left pedal is being maintained a sufficient amount of left pedal may not be available to counteract an unanticipated right yaw. (5) Be alert to changing aircraft flight and wind conditions which may be experienced when flying along ridge lines and around buildings. (6) Stay vigilant to power and wind conditions."

History of Flight

Maneuvering-hover	Loss of tail rotor effectiveness (Defining event)
Emergency descent	Loss of control in flight Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Commercial	**Age:**	62, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With Waivers/Limitations	**Last Medical Exam:**	12/16/2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	05/02/2012
Flight Time:	8459 hours (Total, all aircraft), 2 hours (Total, this make and model), 5659 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	BELL	**Registration:**	N85RB
Model/Series:	206B	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	831
Landing Gear Type:	High Skid	**Seats:**	5
Date/Type of Last Inspection:	05/31/2011, Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Turbo Shaft
Airframe Total Time:	17038 Hours	**Engine Manufacturer:**	ROLLS-ROYC
ELT:	Not installed	**Engine Model/Series:**	250-C20
Registered Owner:	SCOTT JOHN D	**Rated Power:**	400 hp
Operator:	Hawkeye Helicopter	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	KTOP	**Observation Time:**	0953 CDT
Distance from Accident Site:	20 Nautical Miles	**Condition of Light:**	Day
Direction from Accident Site:	210°	**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:	Thin Overcast / 2400 ft agl	**Temperature/Dew Point:**	24°C / 19°C
Lowest Ceiling:	Overcast / 2400 ft agl	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	15 knots/ 21 knots, 200°	**Visibility (RVR):**	
Altimeter Setting:	29.76 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Precipitation		
Departure Point:	Lawrence, KS (KLWC)	**Type of Flight Plan Filed:**	None
Destination:	Lawrence, KS (KLWC)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Minor		

Administrative Information

Investigator In Charge (IIC):	Craig Hatch	**Adopted Date:**	08/29/2012
Additional Participating Persons:	Jeff Smith; FAA FSDO; Wichita, KS Steve Sparks; FAA FSDO; Wichita, KS		
Publish Date:	08/29/2012		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=83546		

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