Aviation Investigation Final Report

Location:	Melrose, New Mexico	**Accident Number:**	DEN07LA024
Date & Time:	November 13, 2006, 11:10 Local	**Registration:**	N24CF
Aircraft:	Bell UH-1H	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation		

Analysis

The helicopter was in cruise flight approximately 600 feet agl (above ground level) when it experienced "moderate to heavy" vibration. The pilot said he knew the tail rotor had failed because the anti-torque pedals would go to the floor with no effect. He also knew the tail rotor had failed when he attempted to make a run-on landing. As they got nearer to the ground, the check pilot "got on the controls" and would not relinquish them. The check pilot pulled back on the cyclic and slowed the helicopter, which immediately started "spinning violently to the right." The pilot-in-command "slammed the collective down" in an attempt to hit the ground hard and turn the helicopter over and stop it from spinning. He tried to roll off the throttle (which is the proper procedure for loss of tail rotor thrust in accordance with the Pilot Operating Handbook), but the check pilot was on the controls and he could not override him. The pilot-in-command turned off the main fuel control in an attempt to shut down the engine and stop the helicopter from spinning. The helicopter impacted terrain and rolled over on its side. Examination of the helicopter revealed both tail rotor blades were missing. The 90-degree gearbox was still attached and the tail rotor drive shaft showed no damage. Despite an extensive search, the tail rotor blades were not recovered. No other anomalies were found.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the in-flight failure and separation of both tail rotor blades. Contributing factors in this accident were the check pilot interferring with the controls and his failure to relinquish control to the pilot-in-command.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: CRUISE - NORMAL

Findings
1. (C) ROTOR SYSTEM,TAIL ROTOR BLADE - SEPARATION

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: DESCENT - EMERGENCY

Findings
2. AUTOROTATION - ATTEMPTED - PILOT IN COMMAND
3. (F) CONTROL INTERFERENCE - CONFLICTING - CHECK PILOT
4. (F) RELINQUISHING OF CONTROL - NOT PERFORMED - CHECK PILOT

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

Findings
5. RUN ON LANDING - ATTEMPTED - PILOT IN COMMAND
6. TERRAIN CONDITION - OPEN FIELD
7. TERRAIN CONDITION - GROUND

Factual Information

On November 13, 2006, approximately 1110 mountain standard time, a Bell UH-1H, N24CF, registered to and operated by World Jet, Inc., of Fort Lauderdale, Florida, and piloted by a airline transport certificated pilot, was substantially damaged when it impacted terrain and rolled over following an autorotation 12 miles north and 2 miles east of Melrose, New Mexico. Visual meteorological conditions prevailed at the time of the accident. The business flight was being conducted under the provisions of Title 14 Code of Federal Regulations Part 91, and no flight plan had been filed. The pilot was seriously injured, but the second pilot was not injured (received minor injuries). The cross-country flight originated at Fort Lauderdale with an en route refueling stop in Longview, Texas, and was en route to Albuquerque, New Mexico. The helicopter departed Longview at an undetermined time.

The following is based on the accident report submitted by the company's owner (the pilot was still in the hospital). The helicopter was in cruise flight approximately 600 feet agl (above ground level) when it experienced "moderate to heavy" vibration (it is believed that this is when "the first tail [rotor] blade came off"). Airspeed was reduced. A few minutes later, the "vibrations almost went away" (it is believed that this is when the "second tail [rotor] blade came off"). The pilot made an autorotation to a corn field. The helicopter impacted the ground and rolled over on its right side. The crew exited the helicopter through the main door and was taken to a nearby hospital for treatment.

A farmer, who was planting wheat nearby, said he saw the helicopter "flying about 100 to 150 feet above the ground," and heard the "rotors popping real loud." He watched as the helicopter "veered north from its westerly heading," which he described as a "gliding left descending turn." He got off his tractor and ran to the crash site. "One [of the pilots] stated he had tail rotor trouble," the farmer wrote.

An FAA inspector interviewed the pilot in his hospital room on November 18, and the following is based on that interview. Prior to departing Fort Lauderdale, the main and tail rotor blades were "tracked." He personally inspected and greased the tail rotor hub. They took off and flew to Longview, Texas, where they spent the night. They planned to fly to Albuquerque, then on to Baja, Mexico, to film the Baja car race.

The pilot said he knew the tail rotor had failed when he felt a "big vibration," then it diminished and he felt no resistance in the anti-torque pedals. He said the pedals would go to the floor with no effect. He also knew the tail rotor had failed when he attempted to make a run-on landing. As they got nearer to the ground, the check pilot "got on the controls" and would not relinquish them. The check pilot pulled back on the cyclic and slowed the helicopter, which immediately started "spinning violently to the right." The pilot-in-command "slammed the collective down" in an attempt to hit the ground hard and turn the helicopter over and stop it

from spinning. He tried to roll off the throttle (which, according to the FAA inspector, is the proper procedure for loss of tail rotor thrust in accordance with the Pilot Operating Handbook), but the check pilot was on the controls and he could not override him. The pilot-in-command turned off the main fuel control in an attempt to shut down the engine and stop the helicopter from spinning.

FAA examination of the helicopter showed both tail rotor blades were missing. The 90-degree gearbox was still attached and the tail rotor drive showed no damaged. Despite an extensive search, the tail rotor blades were not recovered.

Pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	60,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land; Multi-engine sea	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	May 1, 2006
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	March 1, 2005
Flight Time:	10000 hours (Total, all aircraft), 75 hours (Last 90 days, all aircraft)		

Check pilot Information

Certificate:	Airline transport; Commercial	**Age:**	59,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	June 1, 2006
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	16500 hours (Total, all aircraft), 50 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N24CF
Model/Series:	UH-1H	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	66-01042
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	February 1, 2006 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	12 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	6109 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:		**Engine Model/Series:**	T53L13BA
Registered Owner:	World Jet, Inc.	**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	WDJA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	CVS,4659 ft msl	**Distance from Accident Site:**	22 Nautical Miles
Observation Time:	10:55 Local	**Direction from Accident Site:**	119°
Lowest Cloud Condition:	Clear	**Visibility**	7 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	14 knots / 19 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	300°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.75 inches Hg	**Temperature/Dew Point:**	25°C / 0°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Longview, TX (GGG)	**Type of Flight Plan Filed:**	None
Destination:	Albuquerque, NM (ABQ)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Serious, 1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	34.604721,-103.601112

Administrative Information

Investigator In Charge (IIC):	Scott, Arnold
Additional Participating Persons:	Arturo Castillo; FAA Flight Standards District Office; Lubbock, TX
Original Publish Date:	March 26, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=64882