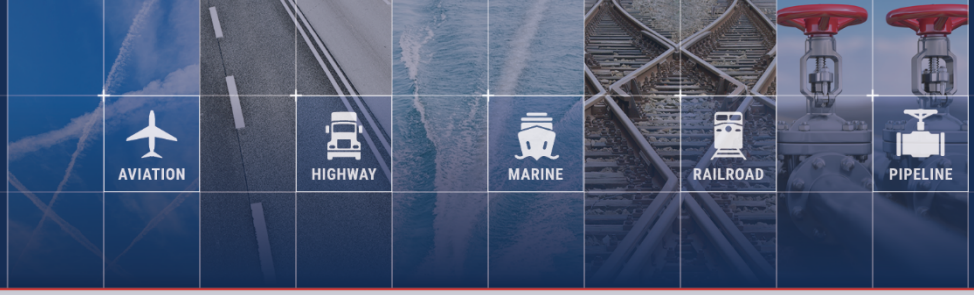

Aviation Investigation Final Report

Location:	Louisville, Kentucky	**Accident Number:**	NYC06TA190
Date & Time:	August 2, 2006, 13:20 Local	**Registration:**	N520AP
Aircraft:	MD Helicopter Inc. 500N	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Minor, 1 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor was providing initial helicopter training to the student, a commercial pilot with fixed wing ratings. The student, with the flight instructor "following closely" on the controls, was practicing approaches to a hover in an open field. After several approaches, they decided to practice a steep approach. About 600 feet above the ground the student began a stabilized approach at 40 knots indicated airspeed, and at a descent rate about 1,000 feet per minute. He then brought the helicopter to a hover about 5 to 10 feet above the ground. The helicopter hovered for between 5 and 15 seconds, before it "drop[ed] to the ground," and rolled onto its right side. The flight instructor further reported that prior to the accident, the helicopter was operating with "no indication of [a] mechanical problem," and the engine seemed to be producing power normally. A witness stated that as the helicopter got close to the ground, "it all of the sudden pitched nose down," and impacted the ground. Examination of the wreckage revealed that both right landing gear struts fractured in ductile overload, consistent with a single impact. Flight control continuity was established, with no anomalies noted.

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 control of the helicopter and the flight instructor's inadequate supervision, which resulted in a hard landing and subsequent rollover.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: LANDING

Findings
1. (C) AIRCRAFT CONTROL - NOT MAINTAINED - DUAL STUDENT
2. (C) SUPERVISION - INADEQUATE - PILOT IN COMMAND(CFI)

Occurrence #2: HARD LANDING
Phase of Operation: DESCENT - UNCONTROLLED

Findings
3. TERRAIN CONDITION - GROUND

Occurrence #3: ROLL OVER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

On August 2, 2006, at 1320 eastern daylight time, a MD Helicopter Inc. 500N, N520AP, was substantially damaged when it impacted terrain during an uncontrolled descent, near Louisville, Kentucky. The certificated flight instructor was not injured, and the certificated commercial pilot sustained minor injuries. Visual meteorological conditions prevailed, and no flight plan was filed for the local instructional flight conducted under 14 CFR Part 91.

According to the flight instructor, he was providing initial helicopter training to the student, a commercial pilot with fixed wing ratings. The student, with the flight instructor "following closely" on the controls, was practicing approaches to a hover in an open field. After several approaches, they decided to practice a steep approach. About 600 feet above the ground, the student began a stabilized approach at 40 knots indicated airspeed, and at a descent rate about 1,000 feet per minute. He then brought the helicopter to a hover about 5 to 10 feet above the ground. The helicopter hovered for between 5 and 15 seconds, on a northerly heading, before it "seemed to drop to the ground." The flight instructor recalled that the helicopter dropped straight down, with no lateral movement, then rolled onto its right side. The engine continued to run for about 10 seconds until it shut down.

The flight instructor further reported that prior to the accident, the helicopter was operating with "no indication of [a] mechanical problem," and the engine seemed to be producing power normally. At the time of the accident, the winds were from the northwest at a velocity of about 10 to 15 knots.

According to the student, they approached the field in a stabilized descent about 60 knots indicated airspeed. He then arrested the descent, and entered a hover about 10 feet above the ground. While stabilizing the hover, the student felt a sensation of descending very rapidly. The next thing he remembered, the helicopter was on its side, and the engine and rotor blades were coming to a stop.

Two witnesses observed the helicopter before and during the accident. One witness reported seeing the helicopter as she drove on a road adjacent to the landing field. She described that the helicopter looked like it was going to land "normally," but that as it got close to the ground, "it all of the sudden pitched nose down," and impacted the ground. When asked if the helicopter had hovered or paused in the air, she stated that it continually moved forward and down during the approach, then "just hit the ground."

The other witness reported seeing the helicopter as it approached the field. She stated that the helicopter descended, paused for a moment near the ground, then impacted the ground.

The flight instructor held a commercial pilot certificate with ratings for airplane single engine

land and rotorcraft-helicopter, and a flight instructor certificate with a rating for rotorcraft. He reported 2,028 total hours of flight experience, 1,860 hours of which were in rotorcraft, and 740 hours of which were in the accident helicopter make and model.

The student held a commercial pilot certificate with ratings for airplane single and multiengine land, and instrument airplane. He reported 345 total hours of flight experience, 5 hours of which were in rotorcraft, all in the accident helicopter make and model.

Representatives from the airframe and engine manufacturers, as well as a Federal Aviation Administration (FAA) inspector, examined the wreckage following the accident. The helicopter came to rest on its right side, and both the right forward and rear landing gear struts were fractured about 14 inches from the fuselage. Examination of the forward strut fuselage access hole revealed that it was elongated in the forward and aft direction. There was damage to the right chin bubble and associated structure directly below the right side pedal assembly, and the pitot tube was bent slightly left and caked inside with mud. All of the main rotor blades exhibited extensive damage consistent with ground contact, and there were several ground scars nearby that were of a similar width as the main rotor blades. Flight control continuity was established, with no anomalies noted.

Both portions of the front and rear fractured landing gear were removed and sent to a laboratory for further analysis. No evidence of corrosion or fatigue was found on any of the fracture surfaces. Examination of both the front and rear struts revealed that they exhibited signatures consistent with ductile overload during a single impact.

The weather reported at Bowman Field Airport (LOU), Louisville, Kentucky, located about 8 nautical miles northwest, at 1253, included winds from 280 degrees at 9 knots, temperature 91 degrees Fahrenheit, dewpoint 73 degrees Fahrenheit, and an altimeter setting of 30.02 inches of mercury.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	52,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	December 1, 2005
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 1, 2005
Flight Time:	2028 hours (Total, all aircraft), 740 hours (Total, this make and model), 1781 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 28 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Pilot Information

Certificate:	Commercial	**Age:**	38,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	None None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 1, 2003
Flight Time:	345 hours (Total, all aircraft), 5 hours (Total, this make and model), 203 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	MD Helicopter Inc.	**Registration:**	N520AP
Model/Series:	500N	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	LN095
Landing Gear Type:	Skid	**Seats:**	5
Date/Type of Last Inspection:	June 1, 2006 100 hour	**Certified Max Gross Wt.:**	3350 lbs
Time Since Last Inspection:		**Engines:**	1 Turbo shaft
Airframe Total Time:	4116 Hrs at time of accident	**Engine Manufacturer:**	Allison
ELT:	Not installed	**Engine Model/Series:**	250-C20R/2
Registered Owner:	Louisville Metro Police Department	**Rated Power:**	450 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LOU,546 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	12:53 Local	**Direction from Accident Site:**	330°
Lowest Cloud Condition:	Few / 4800 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.02 inches Hg	**Temperature/Dew Point:**	33°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Louisville, KY (NONE)	**Type of Flight Plan Filed:**	None
Destination:	(NONE)	**Type of Clearance:**	None
Departure Time:	12:30 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Minor, 1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor, 1 None	**Latitude, Longitude:**	38.13972,-85.539169

Administrative Information

Investigator In Charge (IIC):	Muzio, David
Additional Participating Persons:	Sam Weatherford; FAA/FSDO; Louisville, KY Roger Carlin; MD Helicopters Inc.; Mesa, AZ
Original Publish Date:	June 27, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=64256