Aviation Investigation Final Report

Location:	Linden, New Jersey	**Accident Number:**	MIA08LA199
Date & Time:	September 19, 2008, 17:45 Local	**Registration:**	N906BA
Aircraft:	Eurocopter AS-350-BA	**Aircraft Damage:**	Substantial
Defining Event:	Collision during takeoff/land	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor was monitoring the student pilot during a 180-degree autorotation as part of the flight training. The maneuver was entered at 700 feet above the ground and at 100 knots. Once the intended spot was made for the 'power-on' recovery, the flare was started. As the flight instructor advanced the fuel flow control valve into the flight position, the helicopter started to settle and the low rotor speed horn came on. The flight instructor took over the controls advising the student pilot that it was going to be a run-on landing. During the landing, while in the ground run, the nose of the helicopter pitched forward as the skids dug into the mud. The flight instructor pulled back on the cyclic to prevent the blades from contacting the ground. The helicopter came to rest in the upright position in the grassy area. Post accident inspection of the helicopter's main rotor system revealed that the 2,167 hours time in service Starflex component had two of its three arms fractured. Examinations of the fracture surfaces revealed no indications of any pre-existing damage to the areas. The fractures were consistent with overstress and unusual loads, which were produced during abrupt flight control inputs with low main rotor RPM.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flight instructor's delayed remedial action (flight control inputs) during a practice autorotation/run-on landing resulting in fracture damage to the main rotor system Starflex.

Findings

Aircraft	Main rotor head system - Damaged/degraded
Aircraft	(general) - Incorrect use/operation
Personnel issues	Delayed action - Pilot

Factual Information

History of Flight

Maneuvering	Simulated/training event
Autorotation	Attempted remediation/recovery
Landing	Collision during takeoff/land (Defining event)
Landing	Abrupt maneuver

On September 19, 2008, at 1745 eastern daylight time, a Eurocopter AS-350-BA, N906BA, incurred substantial damage during a run on landing at the Linden Airport (LDJ), Linden, New Jersey. The helicopter was operated by Liberty Helicopters. Visual meteorological conditions prevailed and no flight plan was filed for the Title 14 Code of Federal Regulations Part 91, instructional flight. The commercial certificated flight instructor and the commercial certificated student pilot were not injured.

The flight instructor stated that the student pilot was performing a 180 degrees autorotation as part of the flight training. The maneuver was entered at 700 feet above the ground and at 100 knots. The 180 degrees turn to the predetermined spot was good. Once the spot was made for the power recovery, the flare was started. The flight instructor advanced the fuel flow control valve into the flight position, the helicopter started to settle and the low rotor speed horn came on. The flight instructor took over the controls and told the student pilot that it was going to be a run on landing. During the landing, while in the ground run, the nose of the helicopter pitched forward when the skids went into the mud. The flight instructor pulled back on the cyclic to prevent the blades from contacting the ground. The helicopter came to rest in the upright position in the grass area. They disembarked on their own after shutting down the helicopter.

Post event inspection of the helicopter's main rotor system revealed that the 2,167 hours time in service Starflex component had two of its three arms fractured. The Starflex was sent to the National Transportation Safety Board Materials Laboratory for a fracture surface examination. There were no indications of any pre-existing damage to the Starflex arms. The fractures were consistent with overstress and unusual loads, which are produced during abrupt flight control inputs with low main rotor RPM.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	38,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Helicopter; Instrument helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	December 10, 2007
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	August 17, 2008
Flight Time:	2280 hours (Total, all aircraft), 1074 hours (Total, this make and model), 152 hours (Last 90 days, all aircraft), 52 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	29,Male
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Helicopter; Instrument helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	November 28, 2007
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	1104 hours (Total, all aircraft), 5 hours (Total, this make and model), 144 hours (Last 90 days, all aircraft), 36 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Eurocopter	**Registration:**	N906BA
Model/Series:	AS-350-BA	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	1479
Landing Gear Type:	Skid	**Seats:**	6
Date/Type of Last Inspection:	September 18, 2008 AAIP	**Certified Max Gross Wt.:**	4630 lbs
Time Since Last Inspection:	17 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	12803 Hrs at time of accident	**Engine Manufacturer:**	Turbomeca
ELT:	C91A installed, not activated	**Engine Model/Series:**	Arriel 1B
Registered Owner:	Meridian Consulting I Corp Inc.	**Rated Power:**	641 Horsepower
Operator:	Liberty Helicopters	**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	MHIA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LDJ,23 ft msl	**Distance from Accident Site:**	
Observation Time:	17:00 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	60°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.39 inches Hg	**Temperature/Dew Point:**	20°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Linden, NJ (LDJ)	**Type of Flight Plan Filed:**	None
Destination:	Linden, NJ (LDJ)	**Type of Clearance:**	None
Departure Time:	17:40 Local	**Type of Airspace:**	

Airport Information

Airport:	Linden Airport LDJ	**Runway Surface Type:**	
Airport Elevation:	23 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Simulated forced landing

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	40.617221,-74.244445(est)

Administrative Information

Investigator In Charge (IIC):	Obregon, Jose
Additional Participating Persons:	Jeffrey S Bulmer; FAA/FSDO; Saddle Brook, NJ Lindsay B Cunningham; American Eurocopter; Grand Prairie, TX
Original Publish Date:	June 17, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=68976