



Aviation Investigation Final Report

Location:	South Bay, Florida	Accident Number:	ERA13LA242
Date & Time:	May 8, 2013, 09:13 Local	Registration:	N318DB
Aircraft:	Sud Aviation SA 318C	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	4 None
Flight Conducted Under:	Part 91: General aviation - Aerial observation		

Analysis

During a deer population survey flight over swampy terrain, the pilot descended the airplane from 200 feet to a hover about 25 feet above ground level and then side-stepped the helicopter right to maneuver over an island. As he did so, the helicopter began to yaw right and descend. The pilot corrected the yaw and increased collective pitch; however, the helicopter continued to descend. He then moved the cyclic forward in an attempt to fly through effective translational lift, but the descent continued, and the helicopter impacted the swamp and came to rest on its right side. Examination of the wreckage revealed that the helicopter had adequate fuel and was about 400 pounds below its maximum gross weight. No evidence of any preimpact mechanical malfunctions were found that would have precluded normal operation. However, the examination did reveal that the main rotor pitch angle cockpit indication was at 20 degrees (16 degrees when power was applied), which was beyond the redline of 15 degrees.

The helicopter would have required more power to hover in sideways flight, below effective translational lift, than it would have required for a stationary hover. One of the common errors in hovering sideways flight is the failure to maintain proper rotor rpm. The excessive main rotor blade pitch angle and the pilot's report that the helicopter continued to descend after he increased the collective pitch and that he had to correct a right yaw indicate that it is likely that he failed to maintain proper rotor rpm during the hovering sideways flight.

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 proper rotor rpm while hovering in sideways flight.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	Prop/rotor parameters - Not attained/maintained

Factual Information

History of Flight

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

On May 8, 2013, at 0913 eastern daylight time, a SUD Aviation SA 318C (Aerospatiale Alouette II) helicopter, N318DB, operated by Mile Hi Inc, was substantially damaged during impact with a swamp, following an uncontrolled descent from a hover near South Bay, Florida. The commercial pilot and three passengers were not injured. The local aerial observation flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the flight that departed a boat dock near Weston, Florida, at 0713.

The passengers were conducting a deer population survey. The pilot reported that prior to departure, the helicopter was fueled to approximately 105 gallons. Most of the flight was conducted about 200 feet above ground level (agl) at 60 knots. Toward the end of the flight, a passenger asked to get a closer look at a particular area of vegetation. The pilot descended from 200 feet to a hover about 25 feet agl, approximately 30 yards from the intended spot, on a southerly heading, over saw grass. He then side-stepped the helicopter to the right, over to his intended spot, which was above willow trees. As the helicopter neared the willow trees, it began to yaw right and descend. The pilot corrected the yaw and increased collective pitch; however, the helicopter continued to descend. He then moved the cyclic forward in an attempt to fly through effective translational lift, but the descent continued and the helicopter impacted the swamp, coming to rest on its right side. During the impact, the main rotor blades and fuselage sustained substantial damage.

The three passengers reported that they did not hear any warning noises or notice anything abnormal as the helicopter descended to the ground.

A handheld GPS receiver was recovered from one of the passengers and forwarded to the NTSB Vehicle Recorder Laboratory, Washington, D.C. Data were successfully downloaded and plotted; however, the data points did not include time or altitude.

Review of weight and balance information recovered from the cockpit revealed that at the time of the accident, the helicopter weighed about 3,250 pounds (lbs), which was 400 lbs below its maximum gross weight of 3,650 lbs.

The wreckage was examined by representatives from the airframe and engine manufacturer, under the supervision of a Federal Aviation Administration (FAA) inspector. The examination did not reveal any preimpact mechanical malfunctions with the airframe or engine. Adequate fuel remained in the fuel tank and both the fuel control unit and emergency fuel shut-off valve were in the off position, consistent with the pilot securing the helicopter after the accident. The examination also noted that the cockpit indication of the main rotor pitch angle was 20 degrees (16 degrees after power was applied), with redline at 15 degrees.

Review of FAA-H-8083-21A, Helicopter Flying Handbook (HFH), revealed that one of the common errors of hovering sideward flight was failure to maintain proper rotor rpm. The HFH further stated, "Under certain conditions of high weight, high temperature, or high density altitude, a pilot may get into a low rotor rpm situation. Although the pilot is using maximum throttle, the rotor rpm is low and the lifting power of the main rotor blades is greatly diminished. In this situation, the main rotor blades have an AOA that has created so much drag that engine power is not sufficient to maintain or attain normal operating rpm...As soon as a low rotor rpm condition is detected, apply additional throttle if it is available. If there is no throttle available, lower the collective. The amount the collective can be lowered depends on altitude...since the tail rotor is geared to the main rotor, low main rotor rpm may prevent the tail rotor from producing enough thrust to maintain direction control..."

The recorded wind at an airport located about 25 miles east, at 0853, was from 290 degrees at 3 knots.

Pilot Information

Certificate:	Commercial	Age:	48
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	Gyroplane; Helicopter	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	May 3, 2013
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	April 15, 2012
Flight Time:	1091 hours (Total, all aircraft), 295 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Sud Sviation	Registration:	N318DB
Model/Series:	SA 318C	Aircraft Category:	Helicopter
Year of Manufacture:	1968	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	2031
Landing Gear Type:	Skid	Seats:	5
Date/Type of Last Inspection:	January 15, 2013 100 hour	Certified Max Gross Wt.:	3650 lbs
Time Since Last Inspection:	36 Hrs	Engines:	1 Turbo shaft
Airframe Total Time:	11096 Hrs	Engine Manufacturer:	TURBOMECA
ELT:	C91 installed, activated, did not aid in locating accident	Engine Model/Series:	Astazou IIA2
Registered Owner:	MILE HI INC	Rated Power:	530 Horsepower
Operator:	MILE HI INC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	PBI,20 ft msl	Distance from Accident Site:	25 Nautical Miles
Observation Time:	08:53 Local	Direction from Accident Site:	90°
Lowest Cloud Condition:	Few / 3000 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	3 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	290°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	30.12 inches Hg	Temperature/Dew Point:	21°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Weston, FL (NONE)	Type of Flight Plan Filed:	None
Destination:	Weston, FL (NONE)	Type of Clearance:	None
Departure Time:	07:13 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	3 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	4 None	Latitude, Longitude:	26.443889,-80.871109(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Emil A Cirone; FAA/FSDO; Miramar, FL
Original Publish Date:	April 23, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=86890

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