



National Transportation Safety Board Aviation Accident Preliminary Report

Location:	New York, NY	Accident Number:	ERA18MA099
Date & Time:	03/11/2018, 1908 EDT	Registration:	N350LH
Aircraft:	AMERICAN EUROCOPTER CORP AS350B2	Injuries:	5 Fatal, 1 Minor
Flight Conducted Under:	Part 91: General Aviation - Aerial Observation - Sightseeing		

On March 11, 2018, about 1908 eastern daylight time, an American Eurocopter Corp (Airbus Helicopters) AS350B2, N350LH, was substantially damaged when it impacted the East River and subsequently rolled inverted after the pilot reported a loss of engine power near New York, New York. The pilot egressed from the helicopter and sustained minor injuries. The five passengers did not egress and were fatally injured. The scheduled 30-minute, doors-off aerial photography flight was operated by Liberty Helicopters, Inc., on behalf of FlyNYON under the provisions of Title 14 *Code of Federal Regulations* (CFR) Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the flight, which originated from Helo Kearny Heliport (65NJ), Kearny, New Jersey about 1900.

Summary of Pilot Interview

According to the pilot, after he arrived at 65NJ on the day of the accident, he performed a preflight inspection of the helicopter and made sure it was fueled. The first group of passengers from FlyNYON was scheduled to arrive at 1100. The pilot then completed multiple 15- to 30-minute flights that day but could not recall how many.

About 1845, he received a text message from FlyNYON operations personnel scheduling the accident flight. When the FlyNYON van arrived, the pilot checked his passengers' harnesses and put their life vests on. He pointed out where the cutting tool was located on their harness and explained how to use it. He then seated the passengers and secured their harness tethers to hard points on the helicopter. After the passengers were seated, loading personnel assisted them with putting on the helicopter's restraints (For the purpose of this report, "restraint" refers to the seatbelt and shoulder harness installed by the helicopter manufacturer, and "harness" refers to the system provided by FlyNYON).

Before he started the helicopter, the pilot provided a safety briefing that included which of the passengers was going to remove their restraints and which would remain buckled in their restraints during the flight. He asked the passengers to confirm what sights they wanted to see, and they put their headsets on. He finished the safety briefing and again explained how to use the cutting tool to cut the seatbelts. He told them where the fire extinguisher was and told them

that if there was an emergency he would tell the passengers to get back into their seats. He confirmed their points of interest and did a communications check through the headsets. The passengers could hear him and radio traffic, but they did not have microphones and could not speak to the pilot or each other.

Shortly after starting the helicopter's engine, the pilot departed behind two other helicopters and began heading toward the Statue of Liberty at an altitude of between 300 and 500 ft above ground level (agl). During flight, the outboard passengers (left front, left rear, and right rear) stayed in their seats and restraints but turned sideways (outboard) to take photographs. The inboard passengers removed their restraints but remained tethered in their harnesses and sat on the floor with their feet on the helicopter's skids. They flew at 500 ft to the Brooklyn Bridge before continuing up the East River to Central Park. The pilot contacted LaGuardia Airport air traffic control, and the controller provided the pilot with a transponder code and advised him to stay south of the extended centerline of runway 22. He requested to fly at 2,000 ft and began a shallow climb while the left side passengers took photographs of midtown Manhattan. As the helicopter neared the eastern boundary of Central Park, the pilot slowed the helicopter to between 20 and 30 knots groundspeed so the passengers could take photographs. At this point, he noticed that the front passenger's restraint was hanging from the seat. He picked it up, tapped the passenger, and told him to put it back on, which he did. During the interview the pilot also recalled that other passengers had inadvertently released their seatbelts during previous flights.

As they were flying along the eastern side of Central Park, the front seat passenger turned sideways, slid across the double bench seat toward the pilot, leaned back, and extended his feet to take a photograph of his feet outside the helicopter. As the pilot initiated a right pedal turn to begin to head south, the nose of the helicopter began to turn right faster than he expected, and he heard a low rotor rpm alert in his headset. He then observed engine pressure and fuel pressure warning lights and believed he had experienced an engine failure. He lowered the collective pitch control to maintain rotor rpm and let the nose continue to turn to the right. Central Park came into view and he briefly considered landing there but thought there were "too many people." He continued the turn back toward the East River and made his first distress call to air traffic control. He yelled to the passengers to get back in their seats. Due to the helicopter's airspeed, he was not sure he could make it to the East River and reduced rotor rpm so he could "glide better." Once he was in an established autorotative glide, he attempted to restart the engine but was unsuccessful. He waited 1 or 2 seconds and tried the starter again, but there were no positive indications of a successful engine restart on the instrumentation. He checked the fuel control lever and found that it was still in its detent for normal operation. When he was sure he could clear the buildings and make it to the river, he activated the floats at an altitude of about 800 ft agl.

At this point he was "committed to impact," and, when he reached down for the emergency fuel shutoff lever, he realized that it was in the off position. He also noted that a portion of the front seat passenger's tether was underneath the lever.

As the helicopter continued to descend through 600 ft agl, he positioned the fuel shutoff lever to the "on" position and attempted to restart the engine. He observed positive indications on

the engine instruments immediately. As the helicopter descended through 300 ft, he realized that the engine "wasn't spooling up fast enough," and, given the helicopter's proximity to the surface, he had to continue the autorotation. He again reached for the fuel shutoff lever and positioned it back to "off." Passing through between 100 and 50 ft, he began the cyclic flare in an extended glide configuration, but he "did not get a lot of rpm back." He performed a flare reduction at 10 to 15 ft. He pulled the collective pitch control up "as far as it would go." The helicopter then impacted the water at 5° to 10° nose-up attitude.

After impacting the water, the chin bubble on the pilot's side began to fill with water, which quickly covered the floor. He kept his restraint on and reached down for the front seat passenger's carabiner attachment to the helicopter. He turned the knurled screw "two or three rotations"; by that time, the helicopter was "listing past a 45° roll." He then decided to egress the helicopter, and by the time he unbuckled his restraint, he was fully under water. He used two hands to grab the door frame and pull himself out. He surfaced about 4 ft away from the nose of the helicopter and crawled up onto the belly. He stood up and waved for help but could not see anything.

Recovery and Initial Examination of the Helicopter

A tugboat was the first vessel to arrive at the accident site, and the crew began to render assistance. First responders later arrived, and subsequently extricated the five passengers from the helicopter. The helicopter remained submerged in an inverted position in the East River for about 18 hours before it was recovered at slack tide the following day.

Examination of the helicopter revealed that it had been substantially damaged during the impact sequence. Continuity of the flight controls was observed between the cyclic, collective, main rotor servos, and the main rotor head. The cyclic, collective, and pedal control tubes underneath the cockpit floor remained intact. No evidence of blockages or foreign object debris was observed on the engine air inlet barrier filter. Continuity of drive was confirmed between the engine power turbine and the main rotor head. The red main rotor blade remained attached to its respective sleeve and was fractured chordwise about 4 ft from the main rotor blade attachment bolts. The blue and yellow blades were attached to their respective sleeves and were damaged. All three-main rotor blade pitch change links remained attached at their respective pitch horn and rotating swashplate. The vibration absorber remained installed on top of the main rotor head.

Both tail rotor blades remained attached to their hub. One tail rotor blade exhibited a chordwise fracture about 6 inches from its root end. The pitch link of this blade was bent near the outboard rod end. The second tail rotor blade was generally intact, and its pitch links did not exhibit deformation. Rotation of the tail rotor resulted in rotation of the aluminum tail rotor drive shaft's forward riveted connection, but the shaft rotated within the external splined adapter. The external splined adapter remained connected to the internal-splined [flange] adapter and was continuous through the steel tail rotor drive shaft to the tail rotor drive output flange to the engine reduction gearbox. There was no evidence of binding when manually rotating the tail rotor drive.

The fuel flow control lever was found in the off position. The fuel shutoff lever was found in the open position. The snapwire (witness wire) between the fuel shutoff lever and the engine control housing was broken at its lower end where it was normally secured through a hole in the control housing.

The collective stick was in its normally installed position. The collective position was nearly full down. The collective friction lock was able to be rotated by hand. The cyclic stick was in its normally installed position. The cyclic position was found to be aft right. The cyclic friction lock was able to be easily rotated by hand. The collective lever lock was in its stowed position on the center console. Both pedals were found in their normally installed position. The right pedal position was nearly full-forward with a corresponding aft position of the left pedal. The pedals could not be manually actuated. A portable fire extinguisher was found loose in the front-right chin bubble.

Examination of the engine revealed that the engine was still mounted in the helicopter and the cowling was intact. There were no signs of oil or fuel leaks, fire, or uncontainment. The exhaust duct was intact and undamaged. The power turbine wheel could be rotated easily, but only in the free-wheeling direction, which was consistent with internal continuity as well as an intact and operating rotor clutch. The trailing edges of the power turbine blades were examined through the exhaust duct and were all present and undamaged. The gas generator (GG) spool was accessed by reaching into the air inlet duct and turning the axial compressor wheel. The GG spool could be rotated easily by hand; however, a faint scratching noise could be heard from the core, consistent with corrosion due to salt water contact on the shaft bearings. The four magnetic oil chip detectors were removed and found absent of debris. The oil filter bypass indicator was not triggered indicating no blockage in the oil filter. The fuel supply line from the firewall to the fuel pump was disconnected at the firewall fitting and fuel was observed to drain from the line.

Examination of the emergency float system revealed that the three floats installed on the left landing gear skid appeared to be more inflated than the floats on the right landing gear skid. The emergency floats' left pressurized gas cylinder gauge indicated about 0 psi, while the right pressurized gas cylinder gauge indicated about 4,000 psi. A functional check was performed by actuating the cyclic trigger (which is what is used to activate the floats). The trigger mechanism was smooth with no evidence of binding. Continuity of the float system control was established between the trigger, dual cable block, and the activation cable clevis connection. When the trigger was released, the dual cable block returned to its normal position (via spring within the junction box) but the upper and lower turnbuckles remained in their actuated positions.

Examination of the seats and restraint systems revealed that the five passengers onboard the helicopter were provided with airframe manufacturer-installed restraints, as well as a full body harness. The harness system was not installed by the helicopter manufacturer and was comprised of off-the-shelf components consisting of a nylon fall-protection harness that was attached at the occupants' back by a locking carabiner to a lanyard. The lanyard was composed of multiple woven fabric loops, and the opposite end of the lanyard was secured by another locking carabiner to a hard point on the helicopter. A small pouch was attached to the harness and contained a cutting tool. Under normal circumstances, at the end of each flight, FlyNYON

personnel would unscrew the locking carabiner located on the back of the passengers' harnesses so that the passengers could egress.

The wreckage was retained by the NTSB for further examination.

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	AMERICAN EUROCOPTER CORP	Registration:	N350LH
Model/Series:	AS350B2	Aircraft Category:	Helicopter
Amateur Built:	No		
Operator:	LIBERTY HELICOPTERS INC	Operating Certificate(s) Held:	Certificate of Authorization or Waiver (COA); On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	OEMJ

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Dusk
Observation Facility, Elevation:	LGA, 21 ft msl	Observation Time:	1914 EDT
Distance from Accident Site:	3 Nautical Miles	Temperature/Dew Point:	7° C / -6° C
Lowest Cloud Condition:	Scattered / 250 ft agl	Wind Speed/Gusts, Direction:	7 knots, 330°
Lowest Ceiling:	None	Visibility:	10 Miles
Altimeter Setting:	30.06 inches Hg	Type of Flight Plan Filed:	None
Departure Point:	KEARNY, NJ (65NJ)	Destination:	KEARNY, NJ (65NJ)

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	5 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	5 Fatal, 1 Minor	Latitude, Longitude:	40.773611, -73.939444 (est)

Administrative Information

Investigator In Charge (IIC):	Todd G Gunther
Additional Participating Persons:	Bob Hendrickson; FAA/AVP; Washington, DC Seth Buttner; Airbus Helicopters; Grand Prairie, TX Bryan Larimore; SAFRAN Helicopter Engines; Grand Prairie, TX Erell Ravel; BEA; Le Bourget, FN Paul Tramontana; Liberty Helicopters Inc.; Kearny, NJ Jillian O'Brian; FlyNYON; Kearny, NJ Pablo Bravo; Dart Aerospace; San Diego, CA
Note:	The NTSB traveled to the scene of this accident.