

Aviation Safety Department
2701 N. Forum Drive, D10
Grand Prairie, Texas 75052

AIRCRAFT WRECKAGE EXAMINATION REPORT

I. ACCIDENT INFORMATION

NTSB Accident #: ERA13LA242
Aircraft Model & S/N: SA318C, S/N: 2130
Aircraft Registration: N318DB
Operator: Mile High Helicopters
Location: Everglades near Tampa, Florida
Date: 08 May 2013
Time: 0930 EST (1430 GMT)

II. PILOT'S STATEMENT

- Greg Spicola
- 1079 hours TT reported
- 560 hours Helicopter (S300, H269, R22 and SA318) reported
- 506 hours Gyrocopter reported
- First year as full time pilot for company

The pilot reported that the helicopter was based at a boat ramp near 27 and 75 about 23 nautical miles from the accident site. He flew the day before the accident for around 5 hours and started at around 0700 on the day of the accident and flew for approximately 2.5 hours on the accident flight. The night before he departed, he said the helicopter was fueled with about 300 liters of fuel to a level of 400 liters. One female passenger in front left seat was approximately 105 pounds, the passenger in the aft left seat was a male about 180 pounds, and the female passenger in the aft right seat was approximately 110 pounds.

The pilot said they were flying Part 135 for a contract with the Florida Wildlife Commission on a grid pattern. The pilot was flying the second to last grid of the day when one of the passengers asked him to fly over a willow island. He circled the area at about 60 knots and 200 feet and transitioned in a shallow approach profile to a 20-25 hover over the area into the wind (wind approx. 170 @ 6-10). He performed a side step to the right, and as he did so, the helicopter started to descend. He described it as a sinking type descent without a sudden yaw like you would expect with a typical loss of engine power. He pulled collective and pushed the cyclic forward, but he continued to descend. He said it almost felt like settling with power, but he did not get the rate of descent he would expect in that situation. He said the rate of descent increased, but it was not too dramatic.

The pilot and passengers were not injured. The ELT activated on impact. The accident flight was the pilots 5th flight with this particular contract and he had flown

around 11.5 hours in the area. The passengers had two Magellan GPS devices, and the aircraft had an Av Map EKP 4.

The pilot commented that 100 liters is the minimum amount of fuel he would want to fly with. He also sumped the fuel the night before and morning of the accident flight.

The aircraft sat in the swamp for approximately two days after the accident. It did not appear that much fuel leaked out of the helicopter. The owner (Eric Jacobsen) reportedly asked the pilot to vent the engine. He did so for about 4-5 seconds.

John Marrs was the helicopter's primary mechanic.

III. AIRCRAFT INFORMATION

The helicopter, serial number 2130, was manufactured in 1968 and originally sold to and operated by the German Police. A review of the helicopter's records revealed it was then sold to a broker in the Bahamas and subsequently to the owner in 2004. The helicopter received an FAA standard Certificate of Airworthiness/normal category in December 2004, although the aircraft was not eligible for such a certificate due to its military history. The helicopter had accumulated approximately 11,082 hours flight time and the engine had accrued 6362.3 TT, 1882.4 TSO.

IV. ACCIDENT SITE

- The accident site was located in the Florida Everglades near Tampa, Florida, approximately miles from the boat ramp.



V. WRECKAGE EXAMINATION

A. General

- The aircraft was substantially damaged.
- Several cracks were noted in the airframe, and the aircraft's nitrogen crack indicators were red in color, indicating a loss of pressure in the airframe due to cracking.



B. Cabin/Cockpit

- The cabin stayed intact; the only significant evidence of damage to the cabin was a broken right windscreen and water damage.
- Battery power was applied, and the indicators indicated 140 liters of fuel, 16% main rotor pitch (after movement during continuity check), and the appropriate caution/warning lights illuminated.
- The radio stack, transponder, and GPS had been removed from the aircraft and were not available for examination.



C. Flight Controls

- Collective and cyclic flight control continuity was confirmed; movement of these controls resulted in corresponding movement of the main rotor swash plate.
- Tail rotor control continuity was confirmed back to the point at which the tail rotor control cable was disconnected at the tail boom junction to facilitate wreckage recovery.
- The tail rotor control cable was separated at the tail rotor control drum due to an apparent strike (perhaps by one of the tail rotor blades) to the area.
- Rotation of the tail rotor control drum resulted in corresponding pitch change to the tail rotor blades.
- The dual (left side) antitorque pedals were installed, but the dual collective and cyclic had been removed.

D. Main Transmission

- Continuity of the main transmission was confirmed.
- The main transmission drive shaft remained intact, and the freewheel unit functioned correctly when tested.

E. Main Rotor System

- All three main rotor pitch links were separated in overload.
- All three blade sleeves and dampers exhibited impact and/or overload separation damage consistent with sudden stoppage of the main rotor blades.
- All three of the metal constructed main rotor blades exhibited severe downwards bending, trailing edge splitting, and some leading edge impact damage.
- The red and blue blades exhibited upper skin damage near the root.



F. Tailboom

- The tailboom was separated from the airframe at the accident site to facilitate recovery.
- The tailboom structure exhibited some impact damage, and some of the frame was separated in overload.
- The right side of the horizontal stabilizer exhibited some impact damage, particularly on the aft outboard tip consistent with a possible main rotor blade strike.

G. Tail Rotor System

- Both tail rotor blades (metal construction) separated approximately $\frac{1}{4}$ of the length of the blades from the hub consistent with rotation at impact; only one of the two separated blade sections was recovered.
- The tail rotor drive shaft was disconnected from the engine output prior to recovery
- The shaft was bent about $\frac{1}{3}$ aft of the airframe junction, but all hangar bearings were free to rotate.
- Rotation of the shaft resulted in corresponding rotation of the tail rotor.



H. Landing Gear

- The landing gear was intact and relatively undamaged.

I. Hydraulic System

- Hydraulic system components remained intact.
- Hydraulic fluid was no longer present in the tank when the wreckage was examined.
- The pilot reported no anomalies related to the flight controls.

J. Fuel System

- The fuel tank and system remained intact.
- Approximately 140 liters of fuel was present in the tank during the examination.



K. Powerplant

- The aircraft was equipped with a Turbomeca Astazou IIA2, S/N 678.
- The engine remained intact and exhibited no external anomalies.
- Please see TMUSA Onsite Examination Report for additional details.

L. Non-Volatile/Electronic Data

The two Magellan GPS units used by the passengers and the Av Map GPS unit used by the pilot were not present during the examination; AEC and TMUSA investigators requested that those units be downloaded to determine the flight track leading up to the accident. The Av Map data was not recovered; however, some GPS data was recovered from one of the passengers' GPS devices. Not enough data was available to determine the detailed flight track leading up to the accident.

VI. WEIGHT AND PERFORMANCE INFORMATION

The aircraft weight was calculated for several different scenarios based on the following information found in the aircraft's documents and/or provided by the pilot:

- A form found in the helicopter indicated that the aircraft's empty weight was 2348.56 lbs.
- According to the pilot, the pilot plus all three passengers weighed approximately 580 lbs. (185, 180, 105, 110)
- The pilot reported that he fueled to approximately 400 liters/105 gallons prior to the flight

	T/O w/ 580 l. (full fuel)	T/O w/ 400 l.	Accident w/ full fuel @ T/O (212.5 l. remaining)	Accident w/ 400 l. @ T/O (32.5 l. remaining)
Aircraft Empty Weight (Reported)	2348.56	2348.56	2348.56	2348.56
Crew and Passengers	580	580	580	580
Fuel	1040	717	381.2	58.301
Total Weight in pounds	3968.56	3645.56	3309.76	2986.861

The maximum gross weight of the Alouette II SA318C is 3,650 pounds. Jet A fuel weighs 1.7939 lb. per liter. The calculated fuel burn rate of 147 liters per hour was used for the weight calculations above.

Based on the quantity of fuel remaining in the helicopter during the examination (140 liters), it is likely that the aircraft exceeded maximum gross weight at takeoff; however, the aircraft should have been within its allowable weight at the time of the accident

A calculation was performed to determine the aircraft's performance capability to hover out of ground effect at the time of the accident. Based on the conditions (23 degrees C at sea level), and at weight of 3309.76 (highest calculated possible weight at time of accident), there should have been no restrictions on the helicopter's ability to hover in and out of ground effect. The aircraft should have been able to hover out of ground effect up to a pressure altitude of approximately 4,300 feet.