



# Aviation Investigation Final Report

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<b>Location:</b>	Galveston, Texas	<b>Accident Number:</b>	CEN17FA100
<b>Date &amp; Time:</b>	February 6, 2017, 19:09 Local	<b>Registration:</b>	N978RH
<b>Aircraft:</b>	Bell 206B	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>	Controlled flight into terr/obj (CFIT)	<b>Injuries:</b>	1 Fatal, 2 None
<b>Flight Conducted Under:</b>	Part 135: Air taxi & commuter - Non-scheduled		

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## Analysis

The non-scheduled passenger helicopter flight departed from an oil tanker ship that was anchored in a bay. The pilot reported that the departure had been delayed, but, when the helicopter did depart, the weather was "good." He said he had more than 6 miles visibility, that and he could see the moon above and the water below, and that his en route altitude was between 700 and 800 feet. He added that as the flight approached the shore at 500 feet, he could see the city lights and lights off the water. The next thing he remembered was being in the water. He and the two passengers were subsequently found by the US Coast Guard about 1 hour later. The nearest weather observation station, located 8 miles east of the accident site, reported an overcast ceiling of 400 feet and 5 miles visibility in mist about 17 minutes before the accident. TAFs and AIRMETs issued about 1.5 hours and 1 hour before the accident, respectively, forecast instrument meteorological conditions (IMC). Postaccident examination of the helicopter wreckage was consistent with a relatively level impact, and no pre-impact mechanical anomalies were noted that would have precluded normal operation. It is likely that the flight encountered IMC at night and that the pilot did not properly gauge the distance of the helicopter from the water, which led to its collision with the water.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's failure to recognize the flight had encountered instrument meteorological conditions at night, which resulted in an unrecognized descent and collision with water.

## Findings

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<b>Personnel issues</b>	Perception - Pilot
<b>Personnel issues</b>	Incorrect action performance - Pilot
<b>Personnel issues</b>	Identification/recognition - Pilot
<b>Personnel issues</b>	Knowledge of meteorologic cond - Pilot
<b>Environmental issues</b>	Drizzle/mist - Effect on operation

## Factual Information

### History of Flight

#### Enroute-descent

Controlled flight into terr/obj (CFIT) (Defining event)

On February 6, 2017, at 1906 central standard time, a Bell 206B-III, N978RH, impacted the waters of West Bay near Galveston, Texas. One passenger was fatally injured. The pilot and a second passenger were seriously injured. The helicopter was destroyed. The helicopter was registered to and operated by Republic Helicopters, Santa Fe, Texas, under the provisions of 14 Code of Federal Regulations (CFR) Part 135 as a non-scheduled domestic passenger flight. Instrument meteorological conditions (IMC) prevailed at the time of the accident. Company flight following was being utilized. The flight originated from the oil tanker Eagle Vancouver, anchored in Galveston Bay, at 1837, and was en route to Republic's Helicopters, Inc., Heliport (2TE1), Santa Fe, Texas.

According to the operator, this was the helicopter's third flight of the day. It departed 2TE1 at 1404 and flew to the Eagle Vancouver, landing at 1457. The pilot shut down and the two passengers, both employees of Societe Generalde Surveillance (SGS), disembarked and began their work on the tanker. The helicopter had originally been scheduled to depart at 1600 but was delayed. The helicopter finally took off at 1837. Official sunset was at 1802. It was scheduled to arrive at 2TE1 at 1910. The last radio communication Republic Helicopters Operations had with the helicopter was at 1906 when the pilot reported, "I have the lights of the shore."

The helicopter was equipped with a GPS SkyRouter fast tracking system that reports the helicopter's position every 2 minutes. The last data point received from the GPS SkyRouter system was at 1906, when the helicopter was about 0.27miles from the Galveston Island coastline at 494 feet and 127 mph. Republic Helicopters An "Inactive" signal was received from the Blue Sky GPS by Republic Helicopters Operations 10 minutes after this last contact, or 1916, and the U.S. Coast Guard was alerted. Based on time and distance from the last data point to the accident location with an approximate helicopter speed of 120 mph, the time of the accident was computed to be 1909.

On February 22, 2017, at 1100, two Federal Aviation Administration inspectors from the Houston Flight Standards District Office interviewed the pilot at the University of Texas Medical Branch in Galveston. Also present was Republic's Director of Safety and the pilot's wife. The pilot confirmed there had been a delay in departure, but when they did depart, the weather was "good." He said he had more than 6 miles' visibility and he could see the moon above and the water below. He contacted Republic Operations, established his flight plan, received a weather update and got the current altimeter setting. His en route altitude was between 700 and 800 feet. He said that as he approached Galveston Island State Park, he had visual reference with the lights from Galveston and lights off the water. The next thing he remembered was being in the water.

he didn't. They had to throw the line again. When they got me to the deck, I just flopped down on the deck. I was so cold. I just don't understand why it took so long for someone to rescue us."

The accident site was at N29°14.39' W94°59.44' -- 4.3 miles from the last Blue Sky data point at an

azimuth of 326.95° and 8 miles, or 283° from Scholes International Airport (KGLS), Galveston. It was 6.96 miles on a heading of 325.73° from 2TE1. The accident site was in an area with little or no ground lights.

### Pilot Information

<b>Certificate:</b>	Airline transport; Private	<b>Age:</b>	30, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 1 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	March 16, 2016
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	March 1, 2016
<b>Flight Time:</b>	1702 hours (Total, all aircraft), 1452 hours (Total, this make and model)		

The 30-year-old pilot held an airline transport pilot certificate with a rotorcraft-helicopter rating, and private pilot privileges with airplane single-engine land and instrument ratings. He was hired by Republic Helicopters on March 31, 2015. His first-class airman medical certificate, dated March 16, 2016, contained no waivers, limitations, or restrictions.

According to Republic Helicopters records, as of September 7, 2016, the pilot had logged a total of 1,702 flight hours, of which 1,552 hours were in rotorcraft, 1,452 hours were in the Bell 206, and another 600 hours in Bell models 222, 230, and 430. He had also logged 220 hours were under simulated instrument conditions, and 4 hours were in actual instrument conditions. He had also logged 150 hours in single-engine airplanes. No night flying time was noted in any category. His last FAA and company proficiency check was accomplished on March 1, 2016, in the Bell 206.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Bell	<b>Registration:</b>	N978RH
<b>Model/Series:</b>	206B III	<b>Aircraft Category:</b>	Helicopter
<b>Year of Manufacture:</b>	1989	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	4075
<b>Landing Gear Type:</b>	Skid	<b>Seats:</b>	5
<b>Date/Type of Last Inspection:</b>	August 31, 2016 Annual	<b>Certified Max Gross Wt.:</b>	3350 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Turbo shaft
<b>Airframe Total Time:</b>	15287 Hrs	<b>Engine Manufacturer:</b>	Allison (Rolls-Royce)
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	250-C20J
<b>Registered Owner:</b>	Republic Helicopters, Inc.	<b>Rated Power:</b>	450 Horsepower
<b>Operator:</b>	Republic Helicopters, Inc.	<b>Operating Certificate(s) Held:</b>	On-demand air taxi (135)
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	R8HA

N978RH, serial number 4075, a model 206B-III, was manufactured by the Bell Helicopter Corporation in 1989. It was powered by an Allison (now Rolls-Royce) 250-C20J turboshaft engine, serial number CAE 270491, rated at 450 shaft horsepower.

The last airframe annual inspection was performed on August 31, 2016, at 15,138.9 total hours. At the time of the accident, the airframe had accrued 15,287.2 total hours. The transponder and pitot-static system were IFR-certified on September 30, 2016 (FAR 91.413 and 91.411). At the last 100-hour inspection, the engine had accumulated 13,645.4 total hours and 24,394 cycles. The last compressor and turbine overhauls were accomplished at 11,872.8 and 13,118.3 hours, respectively.

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Instrument (IMC)	<b>Condition of Light:</b>	Night/dark
<b>Observation Facility, Elevation:</b>	GLS	<b>Distance from Accident Site:</b>	8 Nautical Miles
<b>Observation Time:</b>	18:52 Local	<b>Direction from Accident Site:</b>	193°
<b>Lowest Cloud Condition:</b>		<b>Visibility</b>	5 miles
<b>Lowest Ceiling:</b>	Overcast / 400 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	9 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/ None
<b>Wind Direction:</b>	160°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.95 inches Hg	<b>Temperature/Dew Point:</b>	20°C / 19°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Galveston, TX (NONE)	<b>Type of Flight Plan Filed:</b>	
<b>Destination:</b>	El Paso, TX (2TE1)	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	18:37 Local	<b>Type of Airspace:</b>	Class G

According to Meteorology Group Chairman's Factual Report, AIRMET (Airmen's Meteorological Information) Sierra was issued at 1445 CST, well before the accident flight departure time, and valid at the accident time for the accident site. The AIRMET forecast IFR conditions due to mist developing between 1500 and 1800 CST. The Area Forecast (FA) issued at 1345 CST and valid at the accident time and departure time forecasted a broken ceiling at 2,000 feet with tops at 5,000 feet. The KGLS Terminal Aerodrome Forecast (TAF), valid at the time of the accident, was issued at 1906 CST and was valid for a 23-hour period beginning at 1900 CST. It forecasted the wind to be from 150° at 10 knots, 5 statute miles visibility, mist, and an overcast ceiling at 400 feet agl. The KGLS TAF valid before the departure time was issued at 1726 CST and was valid for a 24-hour period beginning at 1800 CST. It forecasted the wind to be from 150° at 14 knots, 6 statute miles visibility, haze, and scattered clouds at 1,000 feet agl. The 1726 CST KGLS TAF forecast did not forecast L (low) IFR conditions until 2000 CST.

The report noted the phase of the moon was "Waxing Gibbous with 78% of the Moon's visible disk illuminated. The moonlight would have likely been visible above the cloud tops. Below 3,000 feet near the accident site at the accident time would have been instrument meteorological conditions with no moonlight visible."

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>	1 Fatal, 1 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Fatal, 2 None	<b>Latitude, Longitude:</b>	29.239721,-94.990554

The helicopter was recovered from West Bay on February 8, 2017, by T&T Marine Salvage, Inc, and was examined at their facilities at Teichman Point, Galveston, on February 8 and 9, 2017. T&T Marine

Salvage reported the water depth at the accident site was approximately 7 to 8 feet, and all recovered wreckage was found in a radius of 80 to 100 feet.

Damage was consistent with a relatively level water impact. The fuselage was separated into several sections. The cabin and cockpit area was extensively damaged. The main rotor had departed the helicopter. There was evidence of mast bumping. The mast fracture was consistent with the rotating main rotor blades striking the water. Three main rotor blades strikes to the fuselage were noted. Both main rotor blades bore impact damage, with one blade missing two-thirds of its span to the tip. The other main rotor blades had an intact spar, but the spar was bent forward -- consistent with sudden stoppage. Transmission continuity was observed. The last two tail rotor driveshaft segments on the tail boom were missing and evidence indicated that the driveshaft was struck by a main rotor blade at impact. The tail rotor gearbox rotated freely. The helicopter was equipped with STC (supplemental type certificate) Van Horn tail rotor blades. They turned freely , and the hub and blades were relatively intact. Free T/R pitch change was present through the T/R hub. The flight controls exhibited much damage in the cockpit and vertical tunnel areas. No pre-impact anomalies were observed in any airframe systems.

Examination of the instrument panel revealed the following: altimeter, 900 feet; Kollsman window, 29.92 inches of mercury; heading indicator, 220°; Hobbs meter, 4,143.8. Examination of the annunciator panel revealed no stretching of any of the bulb filaments. Examination of the position lights revealed no filament stretching of the red or white lights. The green light and landing lights were destroyed.

## **Medical and Pathological Information**

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The pilot and right rear seat passenger were both seriously injured and were found by the U.S. Coast Guard approximately one hour after the accident, clinging to a section of fuselage. The pilot had sustained stomach and intestinal trauma, several lumbar fractures, and abrasions on his shoulders, consistent with rubbing of the shoulder harness. The left front seat passenger was fatally injured and was found about 100 meters from the wreckage.

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Scott, Arnold
<b>Additional Participating Persons:</b>	Daniel Prince; FAA Flight Standards District Office; Houston, TX Marc Belzile; Transportation Safety Board of Canada; Gatineau Mark Stuntzner; Bell Helicopters; Fort Worth, TX Dave Riser; Rolls-Royce; Indianapolis, IN John McCullough; Republic Helicopters, Inc.; Santa Fe, TX
<b>Original Publish Date:</b>	December 11, 2017
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	The NTSB traveled to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=94691">https://data.nts.gov/Docket?ProjectID=94691</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).