Aviation Investigation Final Report

Location:	Gulf of Mexico, Louisiana	**Accident Number:**	CEN12FA250
Date & Time:	April 17, 2012, 11:55 Local	**Registration:**	N56RD
Aircraft:	Sikorsky S-76B	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	7 None
Flight Conducted Under:	Part 91: General aviation		

Analysis

Four days before the accident flight, the accident helicopter experienced an intermittent loss of power to the No. 2 engine that lasted about 10 to 20 seconds while it was in cruise flight. The pilot described the event as a "rollback" but was uncertain as to how much power the engine actually lost during the event. He reported that the No. 2 engine reestablished power by itself. When he arrived at his destination, he shut down the helicopter and checked for any fault codes generated by the electronic engine control (EEC) units. No faults were recorded. He then performed ground and hover checks, and the helicopter appeared to be operating normally. He continued to fly and completed another two flights to oil platforms that same day. The next day the pilot flew another three flights without incident. A mechanic checked for fault codes, but none were recorded. The helicopter was released for flight with no further ground or flight checks. Because the pilot continued to fly the helicopter without determining the reason for the intermittent loss of engine power, the risk of another engine power loss remained high.

On the day of the accident, the pilot departed for an oil platform with six passengers and full fuel. The postaccident calculated takeoff weight was about 515 pounds over the maximum gross weight. The postaccident calculated weight of the helicopter during the approach to the oil platform was about 55 pounds below the maximum gross weight. Although the helicopter was within weight limits during the approach, its higher gross weight as compared to what it would have weighed if the pilot had loaded it within limits for the departure decreased its performance capability. The closest surface weather station, located 21 miles away, indicated that the wind was from 070 degrees at 5 knots at the time of the accident, but the pilot believed his last GPS reading of the wind was from 220 degrees at 5 to 6 knots. The pilot flew a visual approach to the oil platform on a 190-degree heading, which limited the go-around potential since it was on a direct course for the oil platform's super structure. The pilot reported that the helicopter was about 60 feet from and 15 to 20 feet above the landing pad with a nose-high attitude in the flare when there was a loss of engine power. The pilot was unsure which engine had the loss of power. With the loss of power, the pilot realized that the trajectory of the helicopter placed it short of the landing pad and that the helicopter was going to hit the platform. He pulled collective pitch and moved the cyclic control aft and to the left to clear the platform. Once clear of the platform, he attempted to lower the collective and gain airspeed, but the helicopter was in a high rate of descent with low airspeed. He pulled collective pitch and flared the helicopter before water impact. The pilot reported that it was about 3 to 4 seconds from the time he maneuvered to avoid hitting the platform to water impact. The helicopter remained on top of the surface as the pilot kept power on the helicopter to keep it from sinking. He deployed the emergency floatation bags and attempted to water taxi toward the oil platform, but there was no directional control since the tail boom was partially separated from the fuselage. All personnel were rescued without injury.

The examination of the wreckage revealed an anomaly within the stepper motor for the No. 2 engine's fuel control. The examination revealed that the end of the output shaft of the stepper motor had overstress fractures and that the shaft was bent. During the overhaul of the stepper motor 8 years before the accident, the pin that attaches the flapper valve lever to the output shaft was pressed onto the output shaft. The force applied to the external lever was sufficient to both crack and bend the output shaft. This condition eventually resulted in a "stuck" stepper motor which limited the fuel flow to the engine and resulted in an intermittent loss of engine power. The EECs did not monitor the performance of the output shaft or the flapper valve lever; therefore, no fault codes were generated by the EECs.

Probable Cause and Findings

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

The intermittent loss of engine power due to a "stuck" stepper motor in the No. 2 engine's fuel control as a result of an inadequate overhaul. Contributing to the accident was the pilot's decision to continue flying the helicopter with a known defect, his decision to depart with the helicopter over its maximum gross weight, and his decision to fly the approach to the oil platform at a high gross weight in a direction that provided limited go-around potential.

Findings

Aircraft	Fuel controlling system - Malfunction
Aircraft	Fuel controlling system - Incorrect service/maintenance
Aircraft	Configuration - Capability exceeded
Environmental issues	Tailwind - Contributed to outcome
Personnel issues	Decision making/judgment - Pilot

Factual Information

History of Flight

Landing-flare/touchdown	Loss of engine power (partial) (Defining event)
Emergency descent	Abrupt maneuver
Emergency descent	Ditching
Post-impact	Part(s) separation from AC
Post-impact	Evacuation

HISTORY OF FLIGHT

On April 17, 2012, about 1155 central daylight time, a Sikorsky S-76B helicopter, N56RD, was substantially damaged during a forced landing in the Gulf of Mexico near the Joe Douglas oil drilling rig (Vermilion VR376A). The pilot, the airplane pilot-rated passenger in the copilot seat, and the five passengers seated in the cabin were not injured. The helicopter was registered to and operated by RDC Marine, Inc., under the provisions of 14 Code of Federal Regulations Part 91, as a business flight. Day visual meteorological conditions prevailed and no flight plan was filed. The flight departed at 1110 from Acadiana Regional Airport (ARA), New Iberia, Louisiana, and was destined for the Joe Douglas.

Background Information
The pilot reported that on Friday, April 13, 2012, he was flying the accident helicopter from an oil platform to Port Fourchon, Louisiana, when the helicopter had an apparent loss of power from the No. 2 engine during cruise flight. The pilot described the event as an engine rollback, but he was unsure about how much reduction in power the engine actually experienced. The autopilot was on when the loss of power occurred. The pilot noticed that the No. 1 torque needle was going into the One Engine Inoperative (OEI) range, so he disengaged the autopilot and lowered the collective to keep the engine out of the OEI range and prevent a temperature exceedance. He reported that there was no torque indicated on the No. 2 engine. He reported that the No. 2 engine was still operating because the N1 speed indicator (gas producer turbine) indicated that the engine was operating, but the pilot was unsure what the N1 needle read. He thought it might have been in the idle range, but he was not certain. The pilot switched back and forth on the load sharing switch between torque and T5 (engine temperature), but it did not seem to have any effect. The red engine out light and the blue manual reversion light did not illuminate. He reported that the No. 2 engine came back on line by itself. When it did, the No. 1 engine had a decrease in power, and the torque and temperature gauges matched up. He reported that the entire event lasted 10 to 20 seconds. After that, the No. 2 engine worked normally during the flight back to Port Fourchon.

Once at Port Fourchon, the pilot shut down the helicopter and checked for any electronic engine control (EEC) system fault codes that might have been recorded when the loss of engine power occurred. The pilot reported that there were no EEC fault codes recorded. He restarted the helicopter and performed hover and power checks. The helicopter appeared to be operating normally, so the pilot decided to continue with scheduled missions, which involved two more flights out to the oil rigs. The pilot overnighted in Patterson, Louisiana. The pilot telephoned the mechanic and left a message about the loss of power to the No. 2 engine. The mechanic was gone for the weekend and did not check his phone messages until Sunday night. The pilot flew three flights out to the oil rigs on Saturday before returning to Hobby Airport (HOU), Houston, Texas, where the helicopter was based. The pilot reported no anomalies occurred on Saturday.

The helicopter did not fly on Sunday. On Monday, the mechanic checked the EEC fault codes but there were none recorded. He checked the torque sensor cannon plugs and sprayed them with corrosion preventative. No engine runs or test flights were performed. No entries were made in the engine or airframe logbooks concerning the intermittent loss of power on April 13, 2012.

Accident Flight
On Tuesday, April 17, 2012, the pilot reported that he arrived at HOU about 0600 to prepare for the flight. The flight departed about 0700 with six passengers and full fuel en route to ARA, which took about one hour and forty minutes. The helicopter was refueled at ARA before departing for the Joe Douglas oil platform, which was located about 117 nautical miles away on a 180 heading. The helicopter arrived at the Joe Douglas platform about 45 minutes later.

The pilot reported that he made a visual approach on a 190 degree heading to the landing platform. He reported that the wind was from 220 degrees at 5 to 6 knots, according to the Garmin 500 GPS that was installed in the helicopter. He was flying directly towards the platform while decelerating from 60 to 45 knots while maintaining a 12 degree approach angle. The helicopter was about 60 feet from the landing pad and about 15 to 20 feet higher than the landing pad with a nose high attitude in the flare when a loss of engine power occurred. The pilot was unsure which engine had the loss of power. With the loss of power, the pilot reported that the trajectory of the helicopter would place it short of the landing pad. The pilot reported that the helicopter was going to hit the platform, so he pulled collective pitch, banked aft and to the left to avoid contact with the platform. Once clear of the platform, he attempted to lower the collective and gain airspeed, but the helicopter was in a high rate of descent with low airspeed. He pulled collective pitch and flared the helicopter before water impact. The pilot reported about 3 to 4 seconds transpired from the time he tried to avoid hitting the platform to when the helicopter impacted the water. After impacting the water, the helicopter remained on top of the surface as the pilot kept engine power on the helicopter to keep it from sinking. He deployed the emergency floatation bags and attempted to water taxi toward the oil platform, but there was no directional control since the tailboom was partially separated from the fuselage.

The pilot continued to keep engine power on the helicopter as a rescue pod from the Joe Douglas was lowered to the water. The passengers in the cabin were preparing to deploy the life rafts as the rescue pod was being launched. When the rescue pod was near the helicopter, the pilot shut down the engines. The passengers deployed the life rafts as the helicopter began to list to the left. All six passengers and the pilot got into the rafts, and then transferred into the rescue pod, which was then winched back up to the deck of the platform. None of the occupants reported any injuries.

Sometime after the occupants egressed, the helicopter inverted in the water with the four floatation bags keeping it from sinking. However, the bags were compromised during the initial recovery effort and the helicopter later sank in about 310 feet of water. The helicopter was recovered on April 25, 2012, and taken to Port Fourchon where it was examined on April 27, 2012.

PERSONNEL INFORMATION

The pilot held an airline transport certificate with helicopter and single-engine land ratings. He held helicopter and airplane instrument ratings, and was a flight instructor with helicopter, airplane single-engine, airplane multi-engine, instrument helicopter, and instrument airplane ratings. He held a first class medical certificate that was issued on April 16, 2012, with a limitation for corrective lenses. The pilot reported that he had a total flight time of 16,000 hours with 677 hours in Sikorsky S-76B helicopters. He had 36 years of flying experience, with 23 years as a pilot for the operator.

The airplane pilot-rated passenger held an airline transport certificate and was an airplane pilot for the operator. He reported he had about 13,000 hours of total flight hours. He had no formal training in helicopters, but he had about 25 hours of "left seat" time in helicopters. He had flown once before with the accident pilot.

AIRCRAFT INFORMATION

The helicopter was a Sikorsky S-76B, serial number 760368, manufactured in 1991. It was powered by two Pratt and Whitney PT6B-36A gas turbine engines rated at 1,033 shaft horsepower. The S-76B's Rotorcraft Flight Manual (RFM) lists the maximum gross weight as 11,700 pounds. The helicopter was configured with pilot and copilot seats with seating for five in the cabin. The last maintenance inspection was conducted on April 5, 2012, using the manufacturer's approved inspection program. The total airframe hours at the time of the inspection were 4,376 hours. The helicopter had 4,385.9 hours before the first flight on the day of the accident, which was 10.2 hours since the last maintenance inspection.

The pilot and mechanic reported that the Weight and Balance (W&B) form that showed the last time the helicopter had been weighed was in the helicopter at the time of the accident. The W&B form was not found in the helicopter after it was recovered, so the exact W&B for the helicopter at the time of the accident is not known. The pilot and mechanic did not know the empty weight of the helicopter.

The previous W&B form for the helicopter that was available in the helicopter's maintenance records showed that the helicopter's W&B was conducted on December 14, 2004. It indicated that the empty weight of the helicopter was 8,699 pounds. Using the December 14, 2004 W&B information, the postaccident approximate calculated takeoff weight of the helicopter on the accident flight was the following:

1. Takeoff from ARA

Basic Empty Weight: 8,699 lbs

Pilots: 401 lbs

Row 1 Pax: 345 lbs

Row 2 Pax: 658 lbs

Baggage: 140 lbs

Fuel: 1,912 lbs

Life Rafts (2): 60 lbs

Gross Weight: 12,215 lbs (About 515 lbs over maximum gross weight)

2. Approach to the Joe Douglas platform

Basic Empty Weight: 8,699 lbs

Pilots: 401lbs

Row 1 Pax: 345 lbs

Row 2 Pax: 658 lbs

Baggage (20 lbs per person): 140 lbs

Fuel: 1,342 lbs

Lift Rafts (2): 60 lbs

Gross Weight: 11,645 lbs (About 55 lbs under maximum gross weight)

The S-76B RFM states the following regarding a Category B approach to an elevated platform:

The elevated helideck approach and landing profile with scheduled dropdown is shown diagrammatically in Figure 5-8 The landing procedure employs an approach path offset at least one rotor radius to the side of the helideck to permit an un-obstructed go around path in case of engine failure.

SINGLE ENGINE FAILURE DURING APPROACH TO AN ELEVATED HELIDECK

The Landing Decision Point (LDP) is defined as a point 25 feet above, 25 feet to the left or right of, and 150 feet (3 helicopter lengths) short of the helideck in level flight at 30 KIAS, the point at which the pilot begins the sidestep maneuver toward the helideck. If an engine failure occurs prior to beginning the sidestep maneuver, the pilot must perform a "Go Around". If the engine failure occurs after beginning the sidestep maneuver, the aircraft is committed to a landing and the approach must continue to touchdown.

METEOROLOGICAL INFORMATION

At 1115, the surface weather observation obtained from the stationary oil platform KVQT, which was located about 21nm from the Joe Douglas platform on a 301 degree bearing, was wind 080 degrees at 8 knots, visibility 8 miles, scattered clouds at 2,000 feet, broken ceiling at 2,400 feet, overcast 4,800 feet, temperature 25 degrees Celsius (C), dew point 21 degrees C, and altimeter 30.09 inches-of-mercury.

At 1155, the surface weather observation at KVQT was wind 070 degrees at 5 knots, visibility 8 miles, sky clear below 12,000 feet, temperature 26 degrees C, dew point 21 degrees C, and altimeter 30.10 inches-of-mercury.

At 1215, the surface weather observation at KVQT was wind 070 degrees at 5 knots, visibility 9 miles, sky clear, temperature 27 degrees C, dew point 21 degrees C, and altimeter 30.09 inches of mercury.

A National Transportation Safety Board (NTSB) weather specialist reported that the National Weather Surface Analysis Chart for 1000 indicated a cold front moving across the area. Observations from KVQT appear to be prefrontal reports with consistent northeasterly flow with the front moving through at 1335 with a wind shift to the north and northwest.

The weather at the Joe Douglas was recorded daily around 1730 and not on an hourly basis. The recorded weather from the Joe Douglas logbook for April 17, 2012, was: winds north, speed 10 mph, seas 4 to 5 feet, temperature 68 degrees Fahrenheit.

TESTS AND RESEARCH

On April 27, 2012, the helicopter wreckage was examined at Port Fourchon, Louisiana. The tailboom, main rotor blades, and right side cabin door were not recovered from the Gulf of Mexico. A visual examination of the cockpit, cabin, main transmission and main rotor head, and engines was conducted.

The engine's N1 probes and channel A and B torque probes were removed from the helicopter and sent to manufacturer, Pratt and Whitney Canada, (P&WC), for testing. The results of the tests indicated that the corrosion due to the salt water immersion made the test results unreliable.

The No. 1 engine's EEC module A and B and the No. 2 engine's EEC module A and B were removed from the helicopter and sent to the manufacturer, Hamilton Sundstrand, for examination. There was moisture, mud, and sand on both the outside and inside of all four units. The memory chips were removed from the units and downloaded for decoding. The No. 1 engine EEC channel A and B had no faults recorded. The No. 2 engine EEC channel A and B exhibited damaged files which provided no useful information concerning fault codes.

The helicopter wreckage was transported to Air Salvage of Dallas for further examination on May 30 – 31, 2012. Under NTSB supervision, PW&C and Sikorsky technical representatives examined the airframe and engines. Engine teardowns were conducted on both engines, and there were no indications of preaccident mechanical malfunctions or failures that would have precluded normal operation. The No.1 engine's fuel control (hydraulic metering unit (HMU)) and the No. 2 engine's fuel control were sent to Hamilton Sundstrand for examination. Three collective position transducers were sent to Sikorsky for further examination.

The examination of the collective position transducers at Sikorsky revealed external and internal corrosion on all three transducers. Due to the corrosion, none of the transducers were functional.

The examination of the fuel controls at Hamilton Sundstrand on June 26 – 27, 2012, focused primarily on these two components: 1) the stepper motor, and 2) the dual rotary linear transformer (RDVT).

The examination of the No. 1 and No. 2 RDVTs revealed that they exhibited physical binding and anomalies due to salt water immersion. The RDVTs were shipped to the manufacturer, Kearfott Corporation, for further examination.

The Hamilton Sundstrand publication "JFC132-1 Stepper Motor CMM Operation" provides the following information concerning the function of the stepper motor:

"The stepper motor gives the EEC fuel metering authority by opening and closing a flapper valve. This valve in conjunction with orifices in the power lever valve and P3 servo valve set the pressure drop across the metered fuel flow paths in the [fuel] control. The stepper motor converts electrical impulses from the EEC into discrete mechanical rotational movements which rotate the flapper valve nut. Mechanical stops limit rotation to approximately 100 degrees. As the nut is rotated, flapper gap area is varied. Should an electronics failure occur, the stepper motor position remains."

The No.1 stepper motor, serial number 0232, was examined for physical binding and none was observed. The unit was functionally tested by providing electrical signals to the stepper motor and the appropriate rotational movements (steps) were observed.

The No. 2 stepper motor, serial number 0105, was examined and there were no visual indications of damage or corrosion. The inspection of the stepper motor gear head indicated some binding. There was no initial movement of the stepper motor gear head lever. After several attempts some movement was achieved. There was still a ratcheting condition in place. The unit was functionally tested by providing electrical signals to the stepper motor, which provided the following results:

1. Five steps were issued with no stepper motor lever movement. This indicated the stepper motor was missing steps.

2. Five steps were issued and the stator motor tried to rotate. No lever movement was observed.

3. Five steps were issued and the stator tried to rotate. No lever movement was observed.

4. Five steps were issued and the lever started to move. It moved less than the 5 commanded steps.

The Hamilton Sundstrand examination report indicated that the anomalies that were evident in the No. 2 stepper motor supported a finding of intermittent operation and a fixed or "stuck" position that would be perceived as a minor roll back [in engine power], but not for a large magnitude roll back [in engine power]. A fixed or "stuck" stepper motor would keep the fuel flow at a fixed position when power is commanded.

The No.1 and No. 2 stepper motors were shipped to the manufacturer, Kearfott Corporation, for further examination.

The (2) RDVTs and (2) stepper motors were examined at Kearfott Corporation on November 13-14, 2012. The examination of the RDVTs showed that both units exhibited severe corrosion due to salt water immersion. Neither of the rotors would rotate due to the corrosion, and no further testing was performed.

The examination of the No. 2 stepper motor revealed that normal electrical testing was not possible due to the extent of the corrosion. The output shaft had a significant crack extending across the diameter of the shaft. In order to complete the teardown examination of the stepper motor, the flapper valve lever on the output shaft was removed by cutting the pin that held the lever on the shaft. The housing material of the stepper motor was removed and corrosion was found throughout the electrical section of the stepper motor.

The electric motor section was separated from the gear head section of the stepper motor. The gear head section of the stepper motor was self-enclosed with seals that prevented salt water from contaminating the gear head section. All the gears were removed from the gear head. Binding was observed between the output shaft bearing and the cracked output shaft. Run out of the output shaft was measured at 0.0048 inch. The drawing for the gear shaft limits the run out to 0.0003 inch maximum. Enough force had been applied to the output gear shaft to bend the shaft as exhibited by the run out being 0.0045 inch above the high limits. Debris was observed on the flat part of the gear teeth.

The Kearfott examination report stated that, "It was apparent that a force was applied to the external lever that was sufficient to both crack and bend the output shaft. This increased the run out on the shaft of the unit. Kearfott does not manufacture or install this lever."

The examination of the No. 1 stepper motor revealed no preaccident anomalies that would have precluded normal operation.

The No. 1 and No. 2 stepper motors and the (2) RDVT's were sent to the NTSB Materials laboratory for further examination.

The NTSB Material laboratory's examination of the No. 2 stepper motor revealed that end of the output gearshaft exhibited at least five cracks nearly parallel to each other. The character of these cracks was not consistent with progressive cracking, which typically exhibits branched rather than parallel cracks. Examination of the fracture surfaces revealed that approximately 90 percent of the fracture surface exhibited dimple rupture fracture features, indicative of tensile overstress in ductile materials. The fracture surface area closest to the gearshaft exterior exhibited a faceted morphology indicative of a cleavage fracture, which is consistent with a fracture in case hardened steel. The examination of the output front bearing that surrounds the output gearshaft revealed that is was able to freely spin about the inner race when force was placed on the outer race. No indications of external corrosion or mechanical damage were observed.

The maintenance records indicated that the last overhaul of the No. 2 fuel control and the No. 2 stepper motor was conducted on December 10, 2004, at P&WC. During the overhaul of the stepper motors, a pin was pressed into the output shaft of the stepper motor to attach a lever. This lever engaged a flapper valve which was then turned by the stepper motor. No records of the overhaul for these units were found at P&WC due to an internal computer records system not migrating them to the current system.

Hamilton Sundstrand confirmed that this failure mode of the stepper motor output gearshaft was not common, and there were no records at Hamilton Sundstrand of any similar occurrence.

Hamilton Sundstrand provided an explanation of the JFC132-1 stepper motor fault codes. The explanation stated the following:

1. The EEC incorporated open circuit detection logic to verify the electrical integrity of the stepper motor and drive system. A fault detected would produce a fault code of 15 or 35.

2. There is no fault code for the stepper motor performance. No position feedback of the stepper motor, fuel flow requirement, or control logic was built into the design. There was no requirement to track expected engine performance within the EEC to specifically detect a "stuck" stepper motor.

3. The only fault codes associated with a stepper motor are those generated by the open circuit detection logic.

4. There are several failures within the stepper motor system that can result in a "stuck stepper motor" that are not detected by the EEC. These include the stepper motor gearbox, shaft, etc. and metering valve failures.

5. A "stuck stepper motor" effectively creates a fail freeze condition consistent with the use of a stepper motor with engine power modulation retained through the power lever and rotor speed modulation maintained by the opposite engine.

ADDITIONAL INFORMATION

The Rowan Company representative to the investigation provided the NTSB a schematic of the Rowan "Joe Douglas" Vermilion 376A oil platform as it was positioned on the day of the accident. It also showed direction of the Joe Douglas and the helicopter approach angles as they existed on the day of the accident.

The schematic showed that the helicopter landing pad was located on the north side of the oil platform. An approach heading of 190 degrees, as reported by the accident pilot, put the approach path aiming for the center of the oil platform super structure. This approach angle provided limited clearance for a go-around. Likewise, an approach angle between about 160 to 220 degrees heading provided limited clearance for a go-around due to the location of the super structure. An approach path heading from about 060 to 140 degrees, or from about 230 to 320 degrees, would have provided good go-around capability since there was no super structure behind the landing platform on those headings.

According to the Rowan Company representative, over the last 25 years, Rowan has operated a fleet of approximately 12 airplanes including a Convair 580, a King Air, a Lear jet, a DC-3, a Pilatus PC-12 and a Gulfstream IV and six helicopters ranging from a Bell 206 to a Sikorsky S-76. The high point for Rowan's fleet was the late 1990s at which time Rowan operated approximately five airplanes and three helicopters and employed approximately six pilots and six mechanics on a full-time basis. Since the late 1990s, Rowan sold several of its corporate aircraft. At the time of the Sikorsky S-76 incident, in addition to the helicopter, the company owned and operated a Pilatus PC-12 and a Gulfstream IV. Rowan currently owns no helicopters and just one Gulfstream IV airplane.

Pilot Information

Certificate:	Airline transport	**Age:**	54
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Helicopter; Instrument airplane; Instrument helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	April 16, 2012
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	February 2, 2012
Flight Time:	16000 hours (Total, all aircraft), 677 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Sikorsky	**Registration:**	N56RD
Model/Series:	S-76B	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	760368
Landing Gear Type:	Retractable - Tricycle	**Seats:**	8
Date/Type of Last Inspection:	May 5, 2012 Continuous airworthiness	**Certified Max Gross Wt.:**	11579 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo shaft
Airframe Total Time:	4376 Hrs as of last inspection	**Engine Manufacturer:**	P&W
ELT:	Installed, not activated	**Engine Model/Series:**	PT6-38
Registered Owner:	RDC MARINE INC	**Rated Power:**	985 Horsepower
Operator:	RDC MARINE INC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dawn
Observation Facility, Elevation:	KVQT,82 ft msl	**Distance from Accident Site:**	21 Nautical Miles
Observation Time:	11:55 Local	**Direction from Accident Site:**	301°
Lowest Cloud Condition:	Clear	**Visibility**	8 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	60°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.09 inches Hg	**Temperature/Dew Point:**	26°C / 21°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	New Iberia, LA (ARA)	**Type of Flight Plan Filed:**	Company VFR
Destination:	Gulf of Mexico, LA	**Type of Clearance:**	None
Departure Time:	11:10 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	6 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	7 None	**Latitude, Longitude:**	28.0925,-92.233612(est)

Administrative Information

Investigator In Charge (IIC):	Silliman, James
Additional Participating Persons:	Keith J Kibodeaux; FAA Baton Rouge FSDO; Baton Rouge, LA Thomas Berthe; Pratt & Whitney Canada Corp Chris Lowenstein; Sikorsky John Guttermuth; Hamilton Sundstrand; Windsor Locks, CT Wendell York; Rowan Companies; Houston, TX
Original Publish Date:	December 10, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=83445