



Aviation Investigation Final Report

Location:	Panama City, Florida	Accident Number:	ERA18LA140
Date & Time:	May 2, 2018, 10:00 Local	Registration:	N923SM
Aircraft:	Robinson R22	Aircraft Damage:	Substantial
Defining Event:	Flight control sys malf/fail	Injuries:	1 Minor
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

The float-equipped helicopter was in cruise flight at an airspeed of 80 knots and an altitude of 800 ft mean sea level when it slowly started losing airspeed. The commercial pilot responded by pushing the cyclic control forward, but the airspeed continued to decrease, and the helicopter began to lose altitude. The pilot continued to push the cyclic forward until it contacted the control stop; he then realized that he had no cyclic control authority. The helicopter descended with no forward airspeed until it impacted the water. The helicopter floated briefly until waves struck its side and it rolled inverted. Postaccident examination of the helicopter revealed that the main rotor blades were deformed, the fuselage was substantially damaged, and the tail boom was partially separated. Further, the ropes used to tie down the helicopter’s main rotor blades were found wrapped around the rotor head swashplate and pitch control rods.

Before the flight, the pilot conducted a preflight inspection of the helicopter, which would have included removing the rotor blade tie-down ropes and associated socks that cover the rotor blade tips and storing them under the cockpit seat. However, because the ropes were found wrapped around the swashplate and pitch control rods, it is likely that the tie-down ropes were not properly removed and secured and, at some point during the flight, became entangled with the swashplate and pitch control rods, which prevented the pilot from being able to effectively control the pitch of the helicopter.

Probable Cause and Findings

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

The pilot's failure to properly remove and secure the tie-down ropes during the preflight inspection, which resulted in the ropes becoming entangled in the rotor head swashplate and pitch control rods during flight and the subsequent loss of pitch control.

Findings

Personnel issues	Incomplete action - Pilot
Aircraft	Pitch control - Attain/maintain not possible
Personnel issues	Preflight inspection - Pilot
Environmental issues	Water - Contributed to outcome

Factual Information

History of Flight

Prior to flight	Preflight or dispatch event
Enroute-cruise	Flight control sys malf/fail (Defining event)
Enroute-cruise	Loss of control in flight
Emergency descent	Collision with terr/obj (non-CFIT)

On May 2, 2018, about 1000 central daylight time, a Robinson R-22 Mariner helicopter, N923SM, operated by N923SM LLC., was substantially damaged during a forced landing near Panama City Beach, Florida. The commercial pilot received minor injuries. The flight was operated in accordance with Title 14 *Code of Federal Regulations* Part 91 as a positioning flight. Visual meteorological conditions (VMC) prevailed and no flight plan was filed for the flight that departed Perry-Foley Airport (40J) Perry, Florida at 0830, that was destined for Destin Executive Airport (DTS), Destin, Florida.

The pilot reported that about 90 minutes after departing 40J, while in cruise flight at 80 kts and 800 ft mean sea level (msl), the helicopter slowly started losing airspeed; he pushed the cyclic forward, but the airspeed kept decreasing and the helicopter was beginning to lose altitude. He continued to push the cyclic forward until it hit the stop and then realized he had no cyclic authority. The pilot stated there was no forward airspeed and the helicopter continued to descend until it impacted the water with nearly zero forward airspeed and little flare. The helicopter floated briefly until waves struck the side of it and it turned inverted.

Prior to the flight, the pilot was conducting a preflight inspection, which included removal and storage of the blade tie down ropes and associated "socks" that cover the rotor blade tips. During this procedure, the pilot removed the tie down ropes and thought he placed them under the left cockpit seat storage container. In addition, the flight was conducted with the doors off; they were not installed on the helicopter.

A coworker and fellow pilot was flying in formation with the accident helicopter about 700 ft msl. He was at the 5 o'clock position of the accident helicopter at the same altitude when he noticed that the helicopter slowed from about 80 knots to 30 knots in about 15 seconds. He reported that "I felt something wrong and flew to his 10 o'clock position to see what was happening to him." The pilot further reported that the helicopter was descending in a reverse gliding attitude and struck the water with the tail boom first, before rolling upside down.

Witnesses on the ground from the United States Coast Guard and salvage company stated that the tie down ropes used for the rotor blades were found wrapped around the rotor head assembly, swash plate and pitch control rods. The ropes remained in place when the Coast Guard and recovery team arrived prior to the recovery operation taking place.

According to the pilot and Federal Aviation Administration (FAA) records, the pilot held a commercial pilot certificate with a rating for rotorcraft-helicopter as well as a flight instructor certificate with a rating for rotorcraft-helicopter. The pilot reported 467.7 total hours of flight experience and 467.7 of those hours where in the accident helicopter make and model. In the previous 90 and 30 days, the pilot reported about 50 hours and 20 hours respectively.

According to the FAA airworthiness and the helicopter's maintenance records, the two-seat, semi-rigid single-main-rotor, single-engine helicopter, serial number 1923M, was manufactured in 1991 and was issued a standard airworthiness certificate. The helicopter was equipped with floats and powered by a 160-horsepower Lycoming O-320-B2C series engine, which had 4,988.6 hours total time. As of the most recent annual inspection completed on December 28, 2017, the airframe had 6,988.7 hours total time. The current airframe and engine logbooks were on the helicopter at the time of the accident and were lost.

Examination of the helicopter by an FAA inspector revealed that the main rotor blades were deformed, the fuselage was substantially damaged, and the tail boom was partially separated. In addition, a tiedown rope and blade sock used to secure the helicopter rotor blades on the ground was found tightly wrapped around the swash plate and pitch change links of the main rotor.

At 0953, the weather recorded at Northwest Florida Beaches International Airport Panama City (ECP), Florida, about 12 miles north of the accident site included no clouds or restriction to visibility, wind from 140° true at 9 knots, and visibility 10 statute miles. The temperature was 20°C, and the dew point was 18°C. The altimeter setting was 30.27 inches of mercury.

Pilot Information

Certificate:	Commercial	Age:	22, Male
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	3-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	No
Instructor Rating(s):	Helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	May 8, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	April 8, 2018
Flight Time:	(Estimated) 467.7 hours (Total, all aircraft), 467.7 hours (Total, this make and model), 369.2 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Robinson	Registration:	N923SM
Model/Series:	R22 Mariner	Aircraft Category:	Helicopter
Year of Manufacture:	1991	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	1923M
Landing Gear Type:	N/A; Float; Skid	Seats:	2
Date/Type of Last Inspection:	December 28, 2017 Annual	Certified Max Gross Wt.:	1369 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	6988.7 Hrs as of last inspection	Engine Manufacturer:	LYCOMING
ELT:	Not installed	Engine Model/Series:	O-320-B2C
Registered Owner:	N923SM LLC	Rated Power:	160 Horsepower
Operator:	N923SM LLC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	ECP,68 ft msl	Distance from Accident Site:	12 Nautical Miles
Observation Time:	09:53 Local	Direction from Accident Site:	320°
Lowest Cloud Condition:	Clear	Visibility	
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	9 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	140°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.27 inches Hg	Temperature/Dew Point:	20°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	PERRY, FL (40J)	Type of Flight Plan Filed:	None
Destination:	DESTIN, FL (DTS)	Type of Clearance:	None
Departure Time:	08:30 Local	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	30.173889,-85.807502(est)

Administrative Information

Investigator In Charge (IIC):	Mccarter, Lawrence
Additional Participating Persons:	Kevin Atkins; FAA FSDO; Vestavia Hills, AL
Original Publish Date:	May 29, 2019
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97169

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](#).