



Aviation Investigation Final Report

Location:	Halifax, Massachusetts	Accident Number:	ERA10LA488
Date & Time:	September 19, 2010, 13:07 Local	Registration:	UNREG
Aircraft:	Schulman Mosquito XEL	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The ultralight helicopter was observed flying low over a lake and then hovering over a swamp area with trees. When the helicopter was hovering just above the trees, the tail section yawed left and right, followed by the main rotor blades tipping left and right. The helicopter then entered a spin and nosed over and impacted the trees. A postaccident examination did not reveal any evidence of failures of the helicopter or its components that would have prevented normal operations prior to impact. The pilot purchased the helicopter as a kit and constructed it at the manufacturer's facility with their assistance. Before it was completely built, the pilot departed the facility with the helicopter and declined to receive 10 hours of flight instruction offered by the kit manufacturer. The pilot had his Federal Aviation Administration (FAA) medical certificate revoked 3 years prior to the accident and did not hold a helicopter rating. However, the pilot may have had experience in another type of helicopter and may have accumulated about 12 hours of flight time in the accident helicopter prior to the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's loss of control while hovering. Contributing to the accident was the pilot's limited experience operating the helicopter make and model.

Findings

Personnel issues	Incorrect action performance - Pilot
Aircraft	(general) - Not attained/maintained
Personnel issues	Total experience w/ equipment - Pilot

Factual Information

History of Flight

Maneuvering-hover	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)
Post-impact	Fire/smoke (post-impact)

HISTORY OF FLIGHT

On September 19, 2010, at about 1307 eastern daylight time, an unregistered, experimental, amateur-built, Schulman Mosquito XEL helicopter, owned and operated by a private individual, incurred substantial damage by post crash fire after colliding with trees in a heavily wooded area near East Monponsett Pond, Halifax, Massachusetts. The pilot died in a hospital 24 days after the accident. No flight plan was filed and visual meteorological conditions prevailed for the 14 Code of Federal Regulations Part 91, personal flight. The helicopter departed from Cranland Airport (28M), Hanson, Massachusetts, about half mile from the accident site, earlier that day.

Witnesses on a nearby lake observed the helicopter flying over and around the lake; flying low at times. The helicopter then maneuvered over a swamp area with trees and was seen hovering just above the trees. It was observed yawing its tail boom section left and right about 15 degrees each way; followed by the tipping of its main rotor blades left and right. The helicopter then went into a spin and nosed over impacting the trees.

A representative of the Mosquito aircraft manufacturer and training facility in Florida stated to the responding Federal Aviation Administration inspector that the pilot purchased the aircraft as a kit from them in 2009 and received a service offer to customers where the owner/builder can assemble the helicopter kit under the supervision of the kit manufacturer. The manufacturer also offered 10 hours of initial flight training in the helicopter, which the pilot declined stating he didn't need it because he has experience flying a Robinson R-22 rotorcraft with a friend. The representative observed the pilot fly the helicopter when it was nearly completed. The pilot demonstrated that he did have some rotorcraft flying skills, but also demonstrated difficulty with power/flight control management and demonstrated rotorcraft flying skills typical of pilots flying rotorcraft with a governor, which an R-22 has and the Mosquito XEL does not. The pilot departed the facility with the helicopter before it had all the wiring completed. The pilot and the representative were in contact on a routine basis; the pilot seeking guidance on the completion of the wiring and accessory installation. The representative recalls the pilot mentioned that he had flown the helicopter about a total of 12 hours since departing the manufacturer's facility.

PERSONNEL INFORMATION

The pilot held a commercial pilot certification with single engine and multi-engine land, with instrument ratings. His medical certification was revoked on February 20, 2007, for medical reasons, which at that time he reported 4,000 hours total time. He did not hold a helicopter rating. A copy of the pilot's flight logbook was not provided.

AIRCRAFT INFORMATION

The Mosquito XEL, s/n 1097, an ultralight helicopter, was sold as an ultralight rotorcraft with floats on the skids. The helicopter must be operated with floats installed in order to be in compliance with the 14 Code of Federal Regulations Part 103 weight restrictions limit. When the helicopter is operated without the floats installed, it meets the experimental homebuilt category requiring registration and an airworthiness certification. The pilot must hold a Federal Aviation Administration (FAA) pilot certification for rotorcraft and a FAA medical certificate to operate the helicopter.

At the time of the accident the floats were not installed. The helicopter was not registered and had no airworthiness certification. A copy of the helicopter's maintenance logbook was not provided.

METEOROLOGICAL INFORMATION

The closest official weather observation was at the Plymouth Municipal Airport (PYM), Plymouth, Massachusetts, 8 miles southeast of the accident site. The JKL 1252 METAR, winds from 260 degree at 5 knots; visibility 10 statute miles; few clouds at 2700 feet above ground level; temperature 24 degrees Celsius (C); dew point 14 degrees C; altimeter 30.09 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The responding FAA inspector stated that the aircraft came to rest upside down with the top of the main rotor facing the ground in a heavily wooded swamp area. The majority of the helicopter's fuselage, constructed of fiberglass, was consumed in a post crash fire. Both rubber serpentine drive belts were observed intact, with the main rotor belt melted to the pulley with the reinforcing cord drooping from the melted belt remnants. A section of the tail boom remained intact. Two feet of the tail boom, along with the tail rotor gearbox, was found 25 yards northwest from the main wreckage site. A 2 foot section of the tail rotor drive shaft was sheared off from the main section and found 5 feet from the main wreckage.

There were signatures of tree damage where the broken tail boom section and gear box were thrown away from the main wreckage site. One of the carbon fiber tail rotor blades was found adjacent to the remaining tail boom section at the main wreckage; the other tail rotor blade was found halfway between the main wreckage and where the tail rotor gearbox was found. Both carbon fiber tail rotor blades were broken at their root where they are bonded to the

mounting pad. The tail rotor gearbox was damaged from impact and rotated freely. The main rotor blades, which were constructed from aluminum, remained intact with dents and bends to the top and bottom of the blades. No leading edge impact damage was observed on either main rotor blades.

A wreckage examination was conducted by the helicopter's manufacturer representative with FAA oversight. There was no evidence or indications of failures of the helicopter and its components that would have prevented normal operations prior to tree impact.

ADDITIONAL INFORMATION/ DATA

The Mosquito helicopter's operators manual makes refer to in order to fly the helicopter, potential pilots must receive proper training and it recommended that pilots be trained to private pilot status in a small training helicopter. Training to student pilot status is considered the minimum acceptable amount of training required. Operation of the helicopter by an inadequately trained pilot could result in severe injury or death. To maximize flight safety all helicopters must only be operated within certain areas of the Height-Velocity curve. If the Mosquito is above a level (approximately 10 feet), beyond which a hovering autorotation can be safely performed, it must be at a minimum of 250 feet before hovering is again permitted. In the event of an engine failure while hovering at altitudes between 10 and 250 feet, the rotor blades will not have sufficient inertia to maintain rpm and there will not be sufficient time for the helicopter to build adequate forward speed for a normal autorotation.

Pilot Information

Certificate:	None	Age:	67, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	None	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	4000 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Schulman	Registration:	UNREG
Model/Series:	Mosquito XEL	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:		Serial Number:	1097
Landing Gear Type:	Skid	Seats:	1
Date/Type of Last Inspection:	Unknown	Certified Max Gross Wt.:	600 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	at time of accident	Engine Manufacturer:	Zanzottera
ELT:	Not installed	Engine Model/Series:	MZ 202
Registered Owner:	On file	Rated Power:	64 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	PYM, 148 ft msl	Distance from Accident Site:	8 Nautical Miles
Observation Time:	12:52 Local	Direction from Accident Site:	135°
Lowest Cloud Condition:	Few / 2700 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:	260°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.09 inches Hg	Temperature/Dew Point:	24°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Hanson, MA (28M)	Type of Flight Plan Filed:	None
Destination:	Hanson, MA (28M)	Type of Clearance:	None
Departure Time:	13:00 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	On-ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	42.025001,-70.838058(est)

Administrative Information

Investigator In Charge (IIC):	Obregon, Jose
Additional Participating Persons:	David Dubuc; FAA/FSDO; Lexington, MA John Uptigrove; Innovator Technologies, Inc.; Canada
Original Publish Date:	December 27, 2011
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=77338

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](#).