Aviation Investigation Final Report

Location:	Bloomsburg, Pennsylvania	**Accident Number:**	ERA13LA433
Date & Time:	September 27, 2013, 19:38 Local	**Registration:**	N631DP
Aircraft:	Enstrom F-28C	**Aircraft Damage:**	Minor
Defining Event:	AC/prop/rotor contact w person	**Injuries:**	1 Fatal, 1 None
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

The pilot/owner had just taken control of the helicopter from another pilot. As the relieved pilot was walking away from the helicopter and between the 10- and 11-o'clock position forward of the helicopter, he came into contact with a rotating main rotor blade. The pilot/owner stated that, when exiting the helicopter, it was the company's practice to disengage the rotor drive system and secure the collective control. In this condition, the rotor blades droop below the normal height, and the drooping is most pronounced in the 9- to 12-o'clock position of the rotor disk. According to the helicopter manufacturer representative, the main rotor height can vary depending on how the helicopter landing gear was serviced. In addition, depending on the position of the cyclic, the main rotor can descend lower than 6 feet when the main rotor is operating. It is likely that the pilot/owner unintentionally moved the cyclic, which resulted in the rotor blade descending, and, in combination with the rotor droop, the main rotor blade would have been low enough to strike the relieved pilot's head.

Probable Cause and Findings

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

The relieved pilot's failure to maintain clearance from the rotating main rotor blades after he exited the helicopter.

Findings

Aircraft	Main rotor blade system - Not specified
Personnel issues	Monitoring environment - Flight crew

Factual Information

History of Flight

Standing-engine(s) operating	AC/prop/rotor contact w person (Defining event)

On September 27, 2013, at 1938 eastern daylight time, an Estrom F-28C, N631DP, received minor damage when a relieved pilot, who was walking from the helicopter, was fatally injured after coming into contact with a rotating main rotor blade, near Bloomsburg, Pennsylvania. The airline transport pilot, seated at the controls in the helicopter, was the sole occupant and was not injured. The helicopter was registered to and operated by Heritage Rotors, LLC, under the provisions of Title 14 Code of Federal Regulations Part 91 as a local sightseeing flight at a local fair. Day visual meteorological conditions prevailed, and no flight plan had been filed. The flight was originating at the time of the accident.

According to the pilot/owner's written statement in the NTSB Pilot/Operator Aircraft Accident/Incident Report, he "approached the left side of the helicopter and rested on the seat and looked into the helicopter… [he] was looking down onto the pilot seat considering the location of the pilot seat belt, the headset, and the general condition of the interior. At this point, nothing in the cockpit was touched and was exactly as [the relieved pilot] had left it. It was at this moment that [the pilot] heard a 'thud.'"

According to local law enforcement personnel, the pilot/owner seated in the left front seat of the helicopter had just taken over from the pilot who was walking away from the helicopter when the accident occurred. The pilot in the helicopter stated to local law enforcement immediately after the accident that he saw the previous pilot walking away, thought he had walked beyond the main rotor blades, and looked down to fasten his seatbelt. While he was fastening his seatbelt, he heard the main rotor blades strike something, looked up, and saw the relieved pilot on the ground.

The local law enforcement report stated that the relieved pilot was located between the 10 and 11 o'clock position forward of the helicopter. In addition, the helipad was located in a level, grassy area near the entrance to the fair grounds.

According to Federal Aviation Administration records, the relieved pilot held a commercial pilot certificate for airplane single-engine and multiengine land, airplane single-engine sea, instrument airplane and helicopter, glider, and rotorcraft helicopter. He reported on his last insurance application that he accumulated 3,900 hours of total flight time, of which, 600 hours were in the same make and model as the accident helicopter. His most recent second-class medical certificate was issued in December 2012. At that time, the pilot reported a height of 71 inches. According to the helicopter flight manual, the main rotor could droop to a minimum height of 72 inches.

According to the FAA records, the helicopter was manufactured in 1980 and registered to the operator in 2010. According to the pilot/owner, the most recent annual inspection was performed on July 2, 2013. At the time of the accident, the helicopter had accumulated 2198 hours of total flight time. According to the helicopter manufacturer training guide, the helicopter was equipped with a crew compartment that consisted of "pilot and passenger/co-pilot seating, instrument panel, radio console, and pilot and co-pilot flight controls mounted to the aluminum floor structure and enclosed in the fiberglass cabin shell. The

co-pilot controls are removable and a seat cushion for the third passenger is inserted into the space vacated when the co-pilot collective is removed."

The pilot/owner, reported that there were no mechanical anomalies or malfunctions with the helicopter that would have precluded normal operation prior to the accident. He further reported that he and the relieved pilot both "conducted every aspect of [the] operation purposely for our safety and that of our patrons and neighbors." In addition, he stated that when exiting the helicopter, it is the company's practice to "disengage the rotor drive system and secure the collective control by means of the friction lock…In this condition, the rotor blades 'droop' below the normal height. This drooping is non-symmetrical and most pronounced in the 9 – 12 o'clock position of the rotor [disk]."

In the Operator/Owner Recommendation section of the NTSB Pilot/Operator Aircraft Accident/Incident Report, the pilot/owner stated that he "cannot conceive why [the relieved pilot] would knowingly approach the aircraft in a position he knew well to be the lowest point of the rotor system. This was not our practice and absolutely not his habit."

The weather conditions reported at an airport about 26 nautical miles northwest of the accident location around the time of the accident included calm wind.

According to the helicopter manufacturer representative, the main rotor height can vary depending on how the helicopter landing gear was serviced. In addition, depending on the position of the cyclic, the main rotor can descend lower than six feet when the main rotor is operating.

According to the FAA Helicopter Flying Handbook, "The cyclic pitch control is usually projected upward from the cockpit floor, between the pilot's legs or between the two pilot seats in some models. This primary flight control allows the pilot to fly the helicopter in any direction of travel: forward, rearward, left, and right…The purpose of the cyclic pitch control is to tilt the tip-path plane in the direction of the desired horizontal direction. The cyclic controls the rotor disk tilt versus the horizon, which directs the rotor disk thrust to enable the pilot to control the direction of travel of the helicopter. The rotor disk tilts in the same direction the cyclic pitch control is moved. If the cyclic is moved forward, the rotor disk tilts forward; if the cyclic is moved aft, the disk tilts aft, and so on."

Pilot Information

Certificate:	Airline transport; Flight engineer; Flight instructor	**Age:**	50
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	None
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 2 Without waivers/limitations	**Last FAA Medical Exam:**	February 20, 2013
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 30, 2011
Flight Time:	20000 hours (Total, all aircraft), 4500 hours (Total, this make and model), 13500 hours (Pilot In Command, all aircraft), 158 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Enstrom	**Registration:**	N631DP
Model/Series:	F-28C	**Aircraft Category:**	Helicopter
Year of Manufacture:	1980	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	492-2
Landing Gear Type:	Skid	**Seats:**	3
Date/Type of Last Inspection:	July 2, 2013 Annual	**Certified Max Gross Wt.:**	2350 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2198 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Not installed	**Engine Model/Series:**	HIO-360-E1AD
Registered Owner:	HERITAGE ROTORS LLC	**Rated Power:**	205 Horsepower
Operator:	HERITAGE ROTORS LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	IPT	**Distance from Accident Site:**	26 Nautical Miles
Observation Time:	19:54 Local	**Direction from Accident Site:**	315°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.19 inches Hg	**Temperature/Dew Point:**	16°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Bloomsburg, PA	**Type of Flight Plan Filed:**	None
Destination:	Bloomsburg, PA	**Type of Clearance:**	None
Departure Time:	19:38 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Minor
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	1 Fatal	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 None	**Latitude, Longitude:**	40.99139,-76.466667(est)

Administrative Information

Investigator In Charge (IIC):	Moats, Heidi
Additional Participating Persons:	
Original Publish Date:	August 14, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=88152