



National Transportation Safety Board Aviation Accident Final Report

Location:	Brainerd, MN	Accident Number:	GAA16LA325
Date & Time:	06/17/2016, 1400 CDT	Registration:	N155NR
Aircraft:	MD HELICOPTER 369E	Aircraft Damage:	Substantial
Defining Event:	Part(s) separation from AC	Injuries:	2 None
Flight Conducted Under:	Public Aircraft		

Analysis

The commercial pilot reported that, during an aerial observation flight near known thunderstorms, the right center windscreen shattered. The pilot sustained multiple facial lacerations, but he was able to land the helicopter near a highway without further incident. The pilot reported that he did not see anything strike the windscreen and found no evidence of a bird strike.

Examination of the helicopter revealed that debris from the windscreen substantially damaged two of the main rotor blades and the leading edge of the horizontal stabilizer. Examination of the windscreen and its frame revealed evidence of cracking that originated in the center of the windscreen and propagated outward, consistent with impact forces from outside the helicopter.

DNA from samples taken from portions of the windscreen matched DNA from a Western Kingbird; however, given the extent of the damage to the windscreen, the small size of the Western Kingbird, and the pilot's statement, it is likely that this DNA was due to a previous bird strike and did not result in the failure of the windscreen. Therefore, the reason for the windscreen failure could not be determined.

Probable Cause and Findings

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

The failure of the helicopter's windscreen for reasons that could not be determined based on the available information, which resulted in substantial damage to the main rotor blades and horizontal stabilizer.

Findings

Aircraft

Flight compartment windows - Failure (Cause)

Factual Information

History of Flight

Enroute-cruise	Part(s) separation from AC (Defining event) Off-field or emergency landing
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On June 17, 2016 about 1400 central daylight time (CDT), an MD Helicopters Inc., 369E, N155NR, sustained a windscreen failure in flight, 20 miles south of Brainerd Lakes Regional Airport, Minnesota. The helicopter was registered to the State of Minnesota Department of Natural Resources Enforcement Division and operated as a visual flight rules (VFR) public use local flight under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the flight, and company VFR flight following was in effect.

The commercial pilot reported that he conducted the aerial observation flight near known thunderstorms and that both the passenger and pilot doors had been removed from the helicopter. He reported that, about 20 miles south of his destination, he decreased the helicopter's airspeed to about 110 mph because, "it began to feel a little bumpy." The pilot added that, "suddenly with no warning," the right center windscreen shattered. The helicopter's nose dropped immediately, and the pilot lowered the collective. After slowing the helicopter to maintain control, the pilot conducted a precautionary landing without further incident. The pilot reported that he did not see anything strike the windscreen and found no evidence of a bird strike. Two of the helicopter's main rotor blades and the horizontal stabilizer sustained substantial damage. The pilot sustained facial lacerations, and the observer on board did not sustain any injury.

Pilot Information

Certificate:	Flight Instructor; Commercial	Age:	63, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	4-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	No
Instructor Rating(s):	Helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	08/06/2015
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	09/01/2015
Flight Time:	(Estimated) 7958 hours (Total, all aircraft), 85 hours (Total, this make and model), 7455 hours (Pilot In Command, all aircraft), 88 hours (Last 90 days, all aircraft), 61 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Other Flight Crew Information

Certificate:	None	Age:	49, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	None	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:	0 hours (Total, all aircraft), 0 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	MD HELICOPTER	Registration:	N155NR
Model/Series:	369E 500	Aircraft Category:	Helicopter
Year of Manufacture:	2015	Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	0623E
Landing Gear Type:	Skid	Seats:	4
Date/Type of Last Inspection:		Certified Max Gross Wt.:	3000 lbs
Time Since Last Inspection:		Engines:	1 Turbo Shaft
Airframe Total Time:	91.1 Hours at time of accident	Engine Manufacturer:	Rolls Royce
ELT:	Installed, not activated	Engine Model/Series:	C20B
Registered Owner:	Minnesota Department of Natural Resources	Rated Power:	420 hp
Operator:	Minnesota Department of Natural Resources	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KBRD, 1221 ft msl	Distance from Accident Site:	18 Nautical Miles
Observation Time:	1702 UTC	Direction from Accident Site:	72°
Lowest Cloud Condition:		Visibility	10 Miles
Lowest Ceiling:	Broken / 3000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	9 knots / 19 knots	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	360°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	30.16 inches Hg	Temperature/Dew Point:	22° C / 17° C
Precipitation and Obscuration:	Moderate - In the Vicinity - Thunderstorms - No Precipitation		
Departure Point:	ST CLOUD, MN (STC)	Type of Flight Plan Filed:	Company VFR
Destination:	BRAINERD, MN (BRD)	Type of Clearance:	None
Departure Time:	1325 CDT	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	46.314444, -94.537222 (est)

According to the Federal Aviation Administration Inspector who responded to the accident, the right front windscreen failed in cruise flight for unknown reasons. A post-accident examination of the helicopter by the inspector revealed that debris from the windscreen had made gouges in the main rotor blades and the horizontal stabilizer. A significant portion of the windscreen was not recovered.

Examination of the recovered windscreen pieces revealed evidence of cracking that originated on the external surface of the center of the windscreen and then propagated outward.

****This report was modified on August 30, 2017. Please see the docket for this accident to view the original report.****

Tests And Research

DNA samples taken from portions of the windshield were sent to the Smithsonian Feather Identification Laboratory in Washington, DC. Microscopic examination of one of the samples revealed evidence of feathers. The DNA from the feathers matched the Western Kingbird (*Tyrannus verticalis*), which is a very small bird.

Administrative Information

Investigator In Charge (IIC):	Michael A Hicks	Report Date:	09/06/2017
Additional Participating Persons:	David R Nelson; FAA; Minneapolis, MN		
Publish Date:	03/30/2018		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=93440		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).