



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Mullen, Nebraska	Accident Number:	CEN18LA314
Date & Time:	August 3, 2018, 15:30 Local	Registration:	N130TG
Aircraft:	Airbus EC 130 T2	Aircraft Damage:	Substantial
Defining Event:	Loss of tail rotor effectiveness	Injuries:	1 Serious, 1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot reported that he was approaching a golf course to survey a potential landing area when, during a left turn, the helicopter experienced a loss of tail rotor effectiveness. He stated that he added right pedal and eventually full right pedal to counter the rotation without success. The helicopter impacted the ground, which resulted in substantial damage to the main rotor and fuselage. Parametric data recovered from an onboard recorder showed that the left turn tightened in radius and that both the groundspeed and airspeed decreased during the turn. The left yaw rate increased rapidly as the helicopter entered the downwind portion of the turn. The cockpit image recorder captured the pilot applying a slight right pedal input during the onset of the left yaw, followed by his improper left pedal input that remained until ground impact. There was no evidence of mechanical malfunctions or failures with the helicopter that would have precluded normal operation. The left yaw would likely have been arrested had the pilot applied adequate and correct antitorque pedal when the yaw first started.

Probable Cause and Findings

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

The pilot's inadequate and incorrect antitorque pedal application during a tight, decelerating turn downwind, which resulted in a loss of yaw control.

Findings

Aircraft	Prop/rotor parameters - Not attained/maintained
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Maneuvering	Loss of tail rotor effectiveness (Defining event)
Maneuvering	Loss of control in flight
Maneuvering	Collision with terr/obj (non-CFIT)

On August 3, 2018, about 1530 mountain daylight time, an Airbus EC 130 T2 helicopter, N130TG, lost control while maneuvering near the Dismal River Golf Club, southwest of Mullen, Nebraska. The private pilot was not injured, and the passenger sustained serious injuries. The helicopter sustained substantial damage. The personal flight was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed and no Federal Aviation Administration (FAA) flight plan had been filed for the flight. The personal flight departed Alliance, Nebraska, about 1430, and was en route to Mullen, Nebraska.

According to the pilot, he was approaching the golf course with the intention of surveying a possible landing site. The pilot reported the weather was clear and breezy with 15 to 20 knots of wind from the southeast. The pilot stated that during the left turn, with an airspeed between 40 and 60 knots, he encountered a loss of tail rotor effectiveness. The pilot stated that he initially added right pedal during the first ½ of the turn and increased it to full right pedal for the remainder of the rotation.

The pilot stated that he accepted responsibility for putting the helicopter into that flight situation and in the future, he needed to perform higher, faster, and wider turns.

According the FAA inspector who responded to the accident, the main rotor and fuselage were substantially damaged during the impact. An examination of the helicopter and its systems revealed no mechanical anomalies that would have precluded normal operations.

The helicopter was equipped with an Appareo Vision 1000 image, audio, and data recorder. The recorder was not damaged and was sent to the National Transportation Safety Board Vehicle Recorders Division in Washington, DC, for examination and data recovery. Parametric data from the accident flight was extracted and is available in the public docket for this accident. The details surrounding the data recovered are contained in the specialist's factual report in the public docket for this investigation. The Appareo Vision 1000 provided a field of view over the pilot's shoulder and forward to the instrument panel, including a partial view outside the helicopter windshield. The flight controls, except for the collective control, were also visible. Only the video events associated with the accident flight were viewed.

The helicopter entered a right turn around a group of buildings. A flagpole visible in the video indicated that the winds were out of the south; the flag was mostly unfurled, and the flag was fully visible. After one right turn, the helicopter started a left turn around the same group of buildings. As the turn begins to tighten in radius the helicopter starts to descend. The ground speed showed a decreasing trend with an

indicated airspeed of 30 knots. The heading changed to north, the ground speed decreased, and the airspeed indicator displayed 0 knots. As the helicopter turned to a downwind condition, a left yaw rate rapidly increased and was not arrested, resulting in a loss of yaw control.

At the moment of control loss, the nose was down 18° at which time the pilot made an aft stick input and slight right pedal input, about 1 inch forward of the left pedal. As the yaw continued to develop, the pilot made a left pedal input; this input remained until ground impact. The helicopter rotated 1.25 times from the time of loss of control until ground impact.

According to the FAA Rotorcraft Flying Handbook – Unanticipated yaw is the occurrence of an uncommanded yaw rate that does not subside of its own accord and, which, if not corrected, can result in the loss of helicopter control.

In February 2005, Eurocopter released Service Letter No. 1673-67-04 "Reminder concerning the YAW axis control for all helicopters in some flight conditions" and specifically addressed the operational differences between the Fenestron and the conventional tail rotor. In July 2019, Airbus Helicopters released Safety Information Notice No. 3297-S-00 "Unanticipated left yaw (main rotor rotating clockwise), commonly referred to as LTE" and specifically addressed the characteristics of the unanticipated yaw, and how pilots can respond to avoid or reduce the effect of the unanticipated yaw.

Pilot Information

Certificate:	Private	Age:	61, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	4-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	June 14, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	212.5 hours (Total, all aircraft), 193.8 hours (Total, this make and model), 80.1 hours (Pilot In Command, all aircraft), 112.9 hours (Last 90 days, all aircraft), 44.5 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Airbus	Registration:	N130TG
Model/Series:	EC 130 T2	Aircraft Category:	Helicopter
Year of Manufacture:	2016	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	8320
Landing Gear Type:	Skid	Seats:	7
Date/Type of Last Inspection:	100 hour	Certified Max Gross Wt.:	5800 lbs
Time Since Last Inspection:		Engines:	1 Turbo jet
Airframe Total Time:		Engine Manufacturer:	TurboMeca
ELT:	Not installed	Engine Model/Series:	Arriel 2D
Registered Owner:	On file	Rated Power:	
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:		Distance from Accident Site:	
Observation Time:	15:45 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	9 knots / None	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	180°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	26.89 inches Hg	Temperature/Dew Point:	31°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Aliance, NE (KAIA)	Type of Flight Plan Filed:	None
Destination:	Mullen, NE	Type of Clearance:	None
Departure Time:	14:48 Local	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	1 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious, 1 None	Latitude, Longitude:	41.86111,-101.289443(est)

Administrative Information

Investigator In Charge (IIC):	Rodi, Jennifer
Additional Participating Persons:	Greg R Young; Federal Aviation Administration; Lincoln, NE Seth D Buttner; Airbus Helicopters; TX Bryan Larimore; Safran Helicopter; Grand Prairie, TX Patrice Marin; BEA
Original Publish Date:	November 19, 2019
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=97995

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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](#).