



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Yukon, Oklahoma	<b>Accident Number:</b>	CEN21LA216
<b>Date &amp; Time:</b>	May 12, 2021, 15:30 Local	<b>Registration:</b>	N841BP
<b>Aircraft:</b>	Aerospatiale AS350 B2 ECUREUIL	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Public aircraft		

## Analysis

The pilot receiving instruction (pilot) and the flight instructor were conducting a training flight in the helicopter. They performed several simulated emergencies, each of which required the helicopter's hydraulic system to be turned off and then turned back on at the conclusion of the procedure. The hydraulic system was turned off and on using the hydraulic cut-off switch, an unguarded push-button switch mounted on the end of the pilot's collective stick.

After completing the emergency procedures, the pilot performed four quick stop maneuvers. The flight instructor reported that on the last quick stop, the helicopter slowed normally but then started a left yaw about 25 ft above ground level. The pilot noted the left yaw and attempted to correct it, but his pedal inputs did not stop the yaw. As the pilot tightened his grip on the collective, the hydraulic system turned off, likely due to the pilot inadvertently pressing the hydraulic cut-off switch, and the left yaw rapidly increased to a left spin. According to the flight instructor, the control loads "instantly became excessive," and he noticed the hydraulic light on the caution warning panel was illuminated. The pilot intentionally pressed the hydraulic cut-off switch a total of three times, but hydraulic pressure was never restored. The flight instructor told the pilot that he was taking control of the helicopter. However, the pilot did not relinquish control. The flight instructor attempted to regain control of the helicopter but was unable to overcome the high control loads.

The helicopter continued to spin, impacted the ground, rolled over, and came to rest on its right side. A postimpact fire consumed most of the helicopter. Although examination of the helicopter was limited due to fire damage, no preimpact abnormalities were identified with helicopter's airframe and engine.

The US Customs and Border Protection Air and Marine Operations Division reported that the agency’s selection process for the Air Interdiction Agent Program failed to properly identify that the pilot was not qualified for the program.

Because the pilot did not have the qualifications and experience required for the Air Interdiction Agent Program, he did not have the prerequisite skill necessary to critically assess the situation given by the flight instructor. This resulted in the pilot applying improper corrective actions and failing to relinquish control of the helicopter to the flight instructor when directed, which contributed the accident.

Probable Cause and Findings

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

The pilot receiving instruction’s untimely and unidentified inadvertent activation of the hydraulic cut-off switch, which turned off the hydraulic system while the helicopter was at slow airspeed followed by a rapid power increase, which resulted in a loss of control. Contributing was the pilot’s failure to relinquish control of the helicopter to the flight instructor when directed.

Findings	
Personnel issues	Aircraft control - Pilot
Aircraft	Yaw control - Attain/maintain not possible
Aircraft	(general) - Unintentional use/operation
Personnel issues	Understanding/comprehension - Pilot

# Factual Information

## History of Flight

### Maneuvering

Loss of control in flight (Defining event)

On May 12, 2021, about 1530 central daylight time, an Aerospatiale (Airbus) AS350 B2 helicopter, N841BP, was destroyed when it was involved in an accident near Yukon, Oklahoma. The pilot receiving instruction and the flight instructor were not injured. The helicopter was operated as a *14 CFR Part 91* public aircraft instructional flight.

According to the flight crew, the pilot receiving instruction (pilot) was enrolled in the US Customs and Border Protection Initial Pilot Certification course for the AS350 B2. The flight departed the Will Rogers International Airport (KOKC) and proceeded to the Clarence Page Municipal Airport (KRCE) to conduct training maneuvers. After arrival at KRCE, the flight crew conducted several approaches to the airport including confined area and pinnacle approaches. They then conducted several simulated emergencies, each of which required the helicopter's hydraulic system to be turned off and then turned back on at the conclusion of the procedure. The hydraulic system was turned off and on using the hydraulic cut-off switch, an unguarded push-button switch mounted on the end of the pilot's collective stick.

After the simulated emergencies, the flight crew proceeded to conduct a series of "quick stops." After the third quick stop, the pilot heard a radio call indicating an airplane was on final approach to land on the runway they were using, and the flight instructor indicated that they would clear the runway. The pilot added that he completed a final quick stop and immediately entered a climbing left turn.

The pilot stated that in the turn, he noticed the helicopter yawing left, and his pedal inputs were unable to correct the yaw. When the pilot adjusted his grip on the collective, he felt the hydraulic cut-off button with his thumb as he prepared to reduce collective. As he tightened his grip on the collective, "the hydraulics came offline aggravating the left yaw into a hard left spin." The controls were stiff, and the flight instructor told him to turn the hydraulics back on. The pilot "intentionally pressed the [hydraulic cut-off] button but felt no effect." He pressed the button a second time, but the hydraulic light on the caution warning panel remained illuminated, so he pressed the button a third time.

The flight instructor reported that on the last quick stop, the helicopter slowed normally but then started a left yaw about 25 ft above ground level. After the helicopter yawed about 30° left of centerline, he pushed forward on the cyclic to gain airspeed. The flight instructor stated that "as the aircraft was recovering, the control loads instantly became excessive," and he noticed the hydraulic light on the caution warning panel was illuminated. He told the pilot to turn on the

hydraulics; however, the hydraulic pressure was never restored. The flight instructor told the pilot that he was taking control of the helicopter. However, the pilot did not relinquish control. The flight instructor attempted to regain control of the helicopter but was unable to overcome the high control loads.

The helicopter continued to spin, impacted the ground in a nose-down attitude, rolled over, and came to rest on its right side. Both occupants were able to exit the helicopter before a postimpact fire consumed most of the helicopter.

Examination of the helicopter was limited by the postimpact fire; however, no preimpact abnormalities were identified with helicopter's airframe and engine.

The US Customs and Border Protection Air and Marine Operations Division reported that the agency's selection process for the Air Interdiction Agent Program failed to properly identify that the pilot was not qualified for the program.

### Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	45
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Helicopter	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 2 With waivers/limitations	<b>Last FAA Medical Exam:</b>	January 5, 2021
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	June 29, 2020
<b>Flight Time:</b>	1200 hours (Total, all aircraft), 620 hours (Total, this make and model), 474 hours (Pilot In Command, all aircraft), 12 hours (Last 90 days, all aircraft), 12 hours (Last 30 days, all aircraft)		

### Flight instructor Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	40
<b>Airplane Rating(s):</b>	None	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	Helicopter	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Helicopter; Instrument helicopter	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 2 With waivers/limitations	<b>Last FAA Medical Exam:</b>	September 29, 2020
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	December 17, 2020
<b>Flight Time:</b>	6000 hours (Total, all aircraft), 1000 hours (Total, this make and model), 5500 hours (Pilot In Command, all aircraft), 68 hours (Last 90 days, all aircraft), 23 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Aerospatiale	<b>Registration:</b>	N841BP
<b>Model/Series:</b>	AS350 B2 ECUREUIL	<b>Aircraft Category:</b>	Helicopter
<b>Year of Manufacture:</b>	1987	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	2036
<b>Landing Gear Type:</b>	Skid	<b>Seats:</b>	6
<b>Date/Type of Last Inspection:</b>	May 7, 2021 100 hour	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Turbo shaft
<b>Airframe Total Time:</b>	15261.6 Hrs at time of accident	<b>Engine Manufacturer:</b>	Turbomeca
<b>ELT:</b>	C126 installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	Arriel 1D1
<b>Registered Owner:</b>	US Dept of Homeland Security	<b>Rated Power:</b>	
<b>Operator:</b>	Customs Border and Protection	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KRCE	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	16:15 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>		<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	Overcast / 6000 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	9 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	20°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.29 inches Hg	<b>Temperature/Dew Point:</b>	18°C / 10°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Oklahoma City, OK (KOKC)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Yukon, OK	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>		<b>Type of Airspace:</b>	

## Airport Information

<b>Airport:</b>	Clarence Page Municipal KRCE	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	1354 ft msl	<b>Runway Surface Condition:</b>	Vegetation
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	Traffic pattern

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 None	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	On-ground
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 None	<b>Latitude, Longitude:</b>	35.491833,-97.821178(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Hatch, Craig
<b>Additional Participating Persons:</b>	Bob Harger; FAA FSDO; Oklahoma City, OK Seth Butner; Airbus Helicopters; Grand Prairie, TX Bryan Larimore; Safran Helicopter Engines; Grand Prairie, TX Thomas Wineinger; CBP; Tucson, AZ Erwan Rande; BEA Paul Quinn; CBP
<b>Original Publish Date:</b>	January 19, 2023
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=103077">https://data.nts.gov/Docket?ProjectID=103077</a>

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](#).