



Aviation Investigation Final Report

Location:	Andalusia, Alabama	Accident Number:	ERA22FA343
Date & Time:	July 29, 2022, 14:02 Local	Registration:	N124LN
Aircraft:	Eurocopter AS350	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	2 Serious, 1 Minor
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled - Air Medical (Discretionary)		

Analysis

The medical helicopter was flying a 15-minute flight from its base to a hospital to pick up a patient for transfer to another hospital. The cruise portion of the flight was uneventful. As the helicopter began its descent to the hospital helipad, the pilot lost consciousness, as witnessed by the flight paramedic. The helicopter then departed controlled flight and impacted a field about 1 mile from the hospital helipad. During a postaccident examination of the helicopter, no evidence of any preimpact mechanical malfunctions or failures of the helicopter were identified, nor did the pilot report any.

After the accident, the pilot was admitted to a hospital and underwent evaluation for injury and syncope (loss of consciousness), but no definitive cause of the syncope was identified. Toxicological testing detected ethanol at 0.024 g/dL in a blood specimen collected from the pilot more than 1.5 hours after the crash and detected ethanol in his urine. Testing also detected the cocaine metabolites benzoylecgonine and cocaethylene in the pilot's urine but not in his blood. Based on the pilot's blood ethanol level and an estimated ethanol elimination rate of 0.01 to 0.035 g/dL per hour, the pilot's blood ethanol level at the time of the accident was likely between 0.04 g/dL to 0.08 g/dL. Ethanol at this level would not sufficiently explain the pilot's loss of consciousness but would be expected to have adverse effects on his performance capacity. Thus, it is likely that the pilot was impaired by effects of ethanol at the time of the accident.

The benzoylecgonine detected in the pilot's urine indicated that he had used cocaine. The cocaethylene in his urine indicated that both cocaine and ethanol had been in his system at the same time, with more than a small amount of cocaine likely used. The time elapsed between the pilot's last cocaine use and his blood specimen collection was sufficient for cocaine to be metabolized and for its metabolites to fall below detectable levels in his blood. However, the

precise time of his last cocaine use could not be determined, and the possibility of residual adverse effects from his cocaine use could not be excluded.

The pilot also had a history of obstructed sleep apnea (OSA) and had called out sick the day before the accident, reporting a stomach illness. At the time of the accident, the pilot likely was experiencing some impairing effects from alcohol use and may also have been experiencing impairing effects related to his use of cocaine. However, the event that precipitated the loss of helicopter control was the pilot's acute incapacitation by a syncopal episode, the precise medical cause of which is unknown. Whether the pilot's substance use, reported illness, or OSA (or a combination thereof) contributed to his syncopal episode cannot be determined.

Probable Cause and Findings

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

The pilot's acute incapacitation by a syncopal episode, which resulted in the helicopter departing controlled flight and colliding with terrain.

Findings

Personnel issues	Other loss of consciousness - Pilot
Aircraft	Altitude - Not attained/maintained

Factual Information

History of Flight

Approach	Medical event
Approach	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On July 29, 2022, about 1402 central daylight time, a Eurocopter AS 350 B2, N124LN, was substantially damaged when it was involved in an accident near Andalusia, Alabama. The commercial pilot and one crewmember were seriously injured, and a second crewmember sustained minor injuries. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 135 air medical flight.

The approximately 15-minute flight departed a base in Evergreen, Alabama, and cruised at 2,000 ft mean sea level, destined for Andalusia Health Hospital to pick up a patient for transfer to a different hospital. During a postaccident interview, the pilot stated that he remembered reporting 7 miles from South Alabama Regional Airport (79J), Andalusia, Alabama. Although 79J was not the destination, the pilot made the report on the common traffic advisory frequency for traffic avoidance as an airplane had just departed 79J. The pilot recalled feeling sweaty and clammy toward the end of the flight. He remembered someone telling him to “pull up” three times and then remembered receiving on-site medical care after the accident. The pilot did not recall the accident sequence.

The flight paramedic stated in a postaccident interview that the helicopter was approaching the hospital helipad and descending; however, it seemed low as the helipad was still about 1 mile away. The paramedic recalled that the flight nurse, who was seated behind the pilot, tapped the pilot on the shoulder and said that they were too low. The pilot replied “yeah, yeah, yeah,” and initially leveled off, but then the nose began to pitch down into another descent. At that point the flight nurse made a mayday call, shook the pilot’s seat and told him to “pullup, pullup, pullup.” The helicopter subsequently nosed up, made a left turn, and impacted a field on its right side.

The flight nurse was critically injured and could not provide a statement.

Witnesses in the field near the accident site stated that the helicopter flew overhead about 300 ft above ground level, then nosed up 90° or more before turning left and impacting trees, powerlines, and the ground.

Pilot Information

Certificate:	Commercial	Age:	47, Male
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	4-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	No
Instructor Rating(s):	Helicopter; Instrument airplane	Toxicology Performed:	Yes
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	April 21, 2022
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	May 11, 2022
Flight Time:	3190 hours (Total, all aircraft), 783 hours (Total, this make and model), 2997 hours (Pilot In Command, all aircraft), 48 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Eurocopter	Registration:	N124LN
Model/Series:	AS350 B2	Aircraft Category:	Helicopter
Year of Manufacture:	2006	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	4130
Landing Gear Type:	High skid	Seats:	4
Date/Type of Last Inspection:	July 29, 2022 Continuous airworthiness	Certified Max Gross Wt.:	4961 lbs
Time Since Last Inspection:	0 Hrs	Engines:	1 Turbo shaft
Airframe Total Time:	5322 Hrs as of last inspection	Engine Manufacturer:	Turbomeca
ELT:	C126 installed, activated, did not aid in locating accident	Engine Model/Series:	Arriel 1D1
Registered Owner:	AIR METHODS CORP	Rated Power:	732 Horsepower
Operator:	AIR METHODS CORP	Operating Certificate(s) Held:	On-demand air taxi (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	79J,310 ft msl	Distance from Accident Site:	5 Nautical Miles
Observation Time:	14:56 Local	Direction from Accident Site:	92°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	210°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.07 inches Hg	Temperature/Dew Point:	34°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Evergreen, AL	Type of Flight Plan Filed:	Company VFR
Destination:	Andalusia, AL	Type of Clearance:	None
Departure Time:	14:47 Local	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	2 Serious, 1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	2 Serious, 1 Minor	Latitude, Longitude:	31.309532,-86.495984

The wreckage came to rest on its right side, oriented about 165° magnetic. An approximately 100-ft debris path was oriented on a westerly heading. The beginning of the path consisted of fallen tree branches and powerlines, followed by the aft tail boom and the main wreckage at the end of the path. The three main rotor blades remained attached to their respective hinges; however, all 3 star arms were fractured at an approximately 45° angle and the main rotor blades were resting on the ground in a stacked position. The aft tail section separated in two sections, forward of the horizontal stabilizer and forward of the tail rotor gearbox. The tail rotor system remained attached to the vertical stabilizer. The tail rotor blades remained attached with one exhibiting tip damage and the other partially separated at the root. The tail rotor drive shaft separated at the flex coupling and at the forward steel short shaft. The right horizontal stabilizer exhibited leading edge damage, consistent with a wire strike.

The helicopter was equipped with an air medical interior, which had a right pilot seat and a litter in lieu of a left pilot seat. Two rear seats were for the flight paramedic and flight nurse. Flight control continuity was traced from the cyclic and collective, through crushed and separated push-pull tubes (the left lateral cyclic control push-pull tube and bellcrank under the transmission deck were fractured and separated, consistent with impact forces), to the main rotor system. Anti-torque system continuity was traced from the pedals, through crushed push-pull tubes, to the flexball cable, to the aft tail rotor servo.

Three of the four transmission suspension bars were found broken. The engine remained installed in the helicopter with the front and rear mounts still intact. The gas generator and free turbine could be rotated by hand. The axial compressor exhibited impact marks consistent with foreign object ingestion. The intake bellmouth separated at the three connection points to the compressor casing. Continuity was confirmed through the gas generator to the accessory gearbox and from the free turbine to the end of the transmission shaft. The flector group between the transmission shaft and main transmission input separated.

Flight recorders

An Appareo Vision 1000 cockpit video recorder was retained and forwarded to the National Transportation Safety Board Vehicle Recorders Laboratory for data download. The video recorder's SD card was in the locked position and no data from the accident flight had been stored on it. Additionally, no data was retrieved from the internal memory of the unit.

Medical and Pathological Information

The pilot's Federal Aviation Administration (FAA) medical certification file, postaccident emergency treatment records, and selected personal medical records were reviewed. Results were reviewed from toxicological testing performed by the FAA Forensic Sciences laboratory of specimens collected during the pilot's initial postaccident hospital care.

The pilot's most recent FAA second-class medical certificate was issued on April 22, 2022. At that time, he reported no medication use or active medical conditions. Seven days later, the pilot made an initial visit to a primary care physician on April 29, 2022. During that visit, he

reported a history of OSA, which he was getting relief from an oral appliance he had been using to treat the OSA since 2015. The pilot did not report his OSA to the FAA.

The pilot was admitted to the hospital after the accident and underwent evaluation for injury and syncope (loss of consciousness). No definitive cause of the pilot's syncope was identified.

The FAA toxicological testing results revealed that ethanol was detected in blood at 0.024 g/dL and in urine at 0.08 g/dL. Benzoylcegonine, an inactive metabolite of cocaine, was detected at 165 ng/mL in urine but was not detected in blood. Cocaethylene, a substance that forms in a person's body when cocaine is metabolized in the presence of ethanol, was detected in urine but not in blood. According to hospital records, the pilot's initial hospital blood collection was at 1539 on the date of the accident, and his initial hospital urine collection was at 1729.

Ethanol is the intoxicating alcohol in beer, wine, and liquor. It can adversely affect judgment, coordination, perception, cognition, and vigilance. Even in a small amount, ethanol can impair pilot performance, and the number and seriousness of pilot errors tends to increase with blood ethanol level. FAA regulation imposes strict limits on flying after consuming ethanol, including prohibitions on piloting a civil aircraft within 8 hours of drinking ethanol or while having a blood ethanol level of 0.04 g/dL or greater. Once ethanol has been absorbed into the bloodstream, it is typically eliminated at a rate of about 0.01 to 0.035 g/dL per hour, depending on individual metabolism.

Cocaine (metabolites of which were detected in this case) is a stimulant drug that is commonly used illicitly by recreational users who may seek euphoric effects, feelings of increased alertness, strength, and decisiveness, and appetite suppressant effects. Cocaine is a Schedule II controlled substance under federal law, with a high potential for abuse and dependence, and is a prohibited drug under FAA drug and alcohol regulations for on-demand operators. Cocaine has a myriad of potentially impairing psychological and physiological effects and increases the risk of cardiovascular problems. The major inactive cocaine metabolite benzoylcegonine may be detected in urine for days after last cocaine use. Symptoms from crashing or withdrawing after stopping cocaine use may last for days to weeks.

Review of law enforcement records revealed that the pilot had a conviction for driving under the influence (DUI) in 2012 and an arrest for DUI in May 2022. The pilot did not report his DUI history to his employer or to the FAA before the accident. During the day before the accident, the pilot called out sick from work, reporting a stomach illness (for more information, see Medical Factual Report in the public docket for this accident).

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Clay Perkins; FAA FSDO; Birmingham, AL Jason Trask; Air Methods; Greenwood Village, CO Jerome Bauer; BEA Seth Buttner; Airbus; Grand Prairie, TX Bryan Larimore; Safran; Grand Prairie, TX
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Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=105621

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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](#).