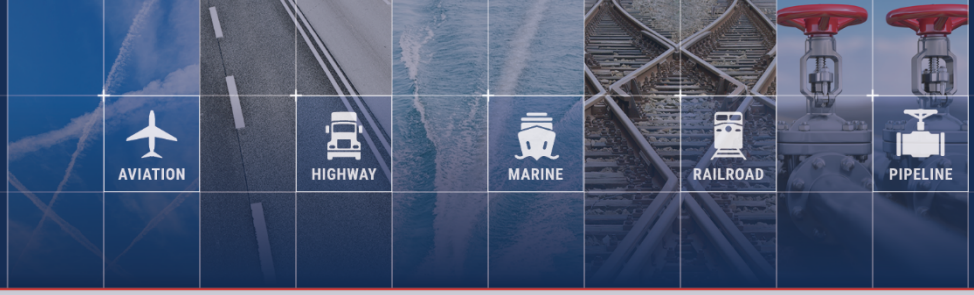

Aviation Investigation Final Report

Location:	Danville, Virginia	**Accident Number:**	ERA22FA114
Date & Time:	February 1, 2022, 10:06 Local	**Registration:**	N622QT
Aircraft:	Cessna 310	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Aerial observation		

Analysis

The pilot was performing an aerial survey flight, and after completing a preflight inspection, he taxied toward the runway for engine run-up and surveying computer start-up. During taxi and the subsequent run-up, the airplane was positioned for about 8-10 minutes with a quartering tailwind. Track data revealed that shortly after takeoff, the airplane's climb rate decreased, and its acceleration stopped. Shortly thereafter, the airplane began a 10°-bank-angle left turn at an airspeed of about 136 knots, followed by a rapidly descending right turn and impact with terrain.

Postaccident examination of the wreckage revealed that the left fuel tank selector handle was in the OFF position, the left throttle was near idle, the left propeller control was near the feather position, and the rudder was trimmed to the right. These control positions were consistent with the left engine being partially secured, which would result in a lack of power and the loss of climb rate noted shortly after takeoff. Additionally, the right fuel tank selector handle was found in the left main fuel tank position. The examination of both engines revealed no evidence of any preimpact anomalies or malfunctions that would have precluded normal operation, and no reason for why the pilot might have partially secured the left engine.

In the event of an engine failure during takeoff, the airplane manufacturer's Pilot's Operating Handbook (POH) assumes that the inoperative propeller is feathered and that 5° of bank toward the operating engine is used to balance the side force generated by a full rudder input. If these conditions do not exist, the airplane can quickly become uncontrollable at airspeeds much higher than the published single-engine minimum controllable airspeed (Vmc). The physical evidence, along with a performance analysis of the airplane's flight track, showed that the left engine was not fully secured, the right engine fuel selector was set to the left tank, and the airplane banked 10° into the inoperative engine at an airspeed of about 136 kt shortly

before the airplane entered a steep, descending right turn. This turn toward the inoperative engine would have dramatically increased the airplane's minimum controllable airspeed above that assumed by the POH (80 knots), and the pilot's ability to maintain control of the airplane would have been significantly reduced. It is likely that during this left turn, the pilot allowed the airplane's airspeed to decrease below a speed for which the airplane would have been controllable, which resulted in a loss of control and led to the airplane's roll to the right and rapid descent toward the terrain.

Postaccident toxicological testing performed by a state office of forensic science revealed that the pilot's carboxyhemoglobin, a marker of carbon monoxide (CO) exposure, was elevated at 31%. Although the Federal Aviation Administration Forensic Sciences Laboratory toxicology results did not show elevated carboxyhemoglobin, these test results might have been misleadingly low if there was an actual postmortem decrease of carboxyhemoglobin in the tested blood. This may have occurred if the specimens were obtained from a collection site where blood intermixed with gastric acid. The carboxyhemoglobin percentage measured in the blood specimen tested by the state forensic science office was confirmed by a second distinct technique, and the probability is small that the elevated result was attributable to postmortem changes.

Examination of the airplane's combustion heater assembly revealed no defects that could have allowed the combustion biproducts to intermix with the ventilation air, and examination of the wreckage revealed no evidence of inflight or post-impact fire. A postaccident test with an exemplar airplane (the same make/model as the accident airplane) that was equipped with an electronic CO detector revealed that when taxiing and performing an engine run-up with a quartering tailwind, the exhaust from the left engine was able to penetrate the cockpit. Based on the observations from this test, it is possible that engine exhaust gasses containing CO could have entered the cockpit while the pilot was conducting his pre-takeoff tasks. Given that the airplane was equipped only with a disposable "spot" CO detector, the pilot would not have been alerted to increasing CO levels unless he had looked at the device and observed a color change. Given that the temperature on the day of the accident was 33° F, it is likely that the airplane's heater was operating. It is possible that its fan could have drawn additional air containing engine exhaust gasses and CO into the cabin heater air intake, and then into the cockpit, which would have increased the pilot's the level of CO exposure. No other source of abnormal CO was identified.

Based on available operational and physical evidence, it is likely that the pilot was impaired due to CO exposure. It is possible that this impairment could have resulted in his perception of a left engine problem, and resulted in him partially securing it, as demonstrated by the postaccident positions of the engine controls. Ultimately, the turn into the partially secured engine resulted in a loss of control and impact with terrain.

Probable Cause and Findings

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

The pilot’s impairment due to exposure to carbon monoxide as a result of undetected engine exhaust penetration into the cockpit, resulting in the pilot's failure to maintain a minimum controllable airspeed after partially securing an engine after takeoff.

Findings

Aircraft	(general) - Not specified
Personnel issues	Carbon monoxide - Pilot
Environmental issues	(general) - Effect on personnel
Aircraft	Engine out control - Not attained/maintained

Factual Information

History of Flight

Enroute-climb to cruise	Medical event
Enroute-climb to cruise	Loss of control in flight (Defining event)

On February 1, 2022, about 1006 eastern standard time, a Cessna 310R airplane, N622QT, was destroyed when it was involved in an accident near Danville, Virginia. The commercial pilot was fatally injured. The airplane was operated by Sol Aerial Surveys as a Title 14 *Code of Federal Regulations* Part 91 aerial surveying flight.

According to another company pilot, on the morning of the accident, he and the accident pilot arrived at the Danville Regional Airport (DAN), Danville, Virginia, conducted their flight planning together, and completed the preflight inspections of their respective airplanes. They then taxied their airplanes to runway 2 for engine run-up and surveying computer start-up. During the taxi and engine run-up, the accident airplane was heading 196º true (205° magnetic). The company pilot estimated that the accident pilot was on that heading for about 8-10 minutes while they completed these pre-departure tasks. The company pilot departed first, and the accident pilot departed several minutes later at 1003.

A performance study was prepared based on automatic dependent surveillance-broadcast (ADS-B) data obtained from the Federal Aviation Administration (FAA). The study and ADSB-B data showed that that the airplane departed DAN and turned toward the southeast. Shortly after takeoff, the airplane's climb rate decreased from 1,200 ft/minute to about 500 ft/minute, and the airplane's acceleration stopped. The airplane reached an altitude of about 2,625 ft above mean sea level (msl) about 2 minutes into the flight and began a 10°-bank-angle left turn at an airspeed of 136 knots. About 10 seconds after turning left, the airplane returned to wings-level and then rolled right at a rate of about 3º/second while descending at a rate of more than 1,000 ft/minute. The last estimated bank angle was over 60° to the right at an altitude of 1,175 ft msl. The airplane impacted a wooded area about 4 nautical miles southeast of DAN.

Pilot Information

Certificate:	Commercial	**Age:**	23,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	May 5, 2021
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	March 16, 2020
Flight Time:	528 hours (Total, all aircraft), 85 hours (Total, this make and model), 449 hours (Pilot In Command, all aircraft)		

According to the operator, the pilot had previously flown aerial surveying and had accrued 85 hours of flight experience in the same make and model of the accident airplane. The accident flight was his first solo aerial surveying flight for the company following several observation flights with the company's owner.

Interviews with friends and family of the pilot revealed that he was happy to have been hired by the operator, got along well with the company's owner, and was pleased that the company's airplanes were newer and better equipped than those at his previous surveying job.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N622QT
Model/Series:	310 R	**Aircraft Category:**	Airplane
Year of Manufacture:	1977	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	310R0828
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	January 19, 2022 Annual	**Certified Max Gross Wt.:**	5680 lbs
Time Since Last Inspection:	18.5 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	6512 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	C126 installed, activated, aided in locating accident	**Engine Model/Series:**	IO-520-MB
Registered Owner:	On file	**Rated Power:**	285 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Review of maintenance records revealed that the airplane's overhauled engines and propellers had accumulated 18.6 hours of operation before the accident.

The airplane was equipped with an adhesive, disposable "spot" carbon monoxide (CO) detector. In the presence of CO, the spot would turn gray/black, and the spot would return to normal color after it is exposed to fresh air.

The Pilot's Operating Handbook (POH) and airplane checklist required the fuel selectors to be placed in the "main" position for takeoff. In the event of an engine failure during takeoff, the POH directed the pilot to feather the inoperative propeller and establish a 5° bank into the operating engine. With an engine shut down, in addition to the reduction in available power, the lateral/directional handling qualities of the airplane change significantly, and the indicated airspeed must be maintained faster than the Vmc of 80 knots to maintain directional control.

The complete POH checklist for an engine failure after takeoff includes the following:

1. Mixtures - AS REQUIRED for flight altitude.
2. Propellers - FULL FORWARD.
3. Throttles - FULL FORWARD.
4. Landing Gear - CHECK UP.
5. Inoperative Engine:
    a. Throttle - CLOSE.
    b. Mixture - IDLE CUT-OFF.
    c. Propeller - FEATHER.
6. Establish Bank - 5° toward operative engine.
7. Wing Flaps - UP, if extended, in small increments.
8. Climb To Clear 50-Foot Obstacle - 92 KIAS.
9. Climb At Best Single-Engine Rate-of-Climb Speed - 106 KIAS at sea level
10. Trim Tabs - ADJUST 5° bank toward operative engine with approximately ½ ball slip indicated on the turn and bank indicator.
11. Cowl Flap - CLOSE (Inoperative Engine).
12. Inoperative Engine - SECURE as follows:
    a. Fuel Selector - OFF (Feel For Detent).
    b. Auxiliary Fuel Pump - OFF.
    c. Magneto Switches - OFF.
    d. Alternator - OFF.
13. As Soon As Practical - LAND.

Cabin Heat System

Review of maintenance records revealed that the cabin heat system was installed in December 2019 at an airframe total time of 5,878.3 hours. Records show that it was serviced and inspected in February 2020, April 2020, and January 2022. It had accrued 317.2 hours in service at the most recent servicing.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DAN,590 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	09:53 Local	**Direction from Accident Site:**	284°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots / None	**Turbulence Type Forecast/Actual:**	Unknown / Unknown
Wind Direction:	60°	**Turbulence Severity Forecast/Actual:**	N/A / Unknown
Altimeter Setting:	30.47 inches Hg	**Temperature/Dew Point:**	1°C / -4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Danville, VA (DAN)	**Type of Flight Plan Filed:**	None
Destination:	Danville, VA	**Type of Clearance:**	None
Departure Time:	10:03 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Danville Regional Airport DAN	**Runway Surface Type:**	Asphalt
Airport Elevation:	571 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:	2	**IFR Approach:**	None
Runway Length/Width:	5900 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	36.556292,-79.253198

The wreckage was highly fragmented along the 382-ft debris path oriented on a true heading of 246°. The accident site elevation was about 488 ft mean sea level. There was a strong fuel odor but no evidence of fire.

The largest portion of the wreckage, consisting of the empennage, an engine, and the remnants of the cockpit was located about 214 ft beyond the severed treetops at the base of a 16-in-diameter pine tree that was broken about 15-20 ft above the ground. A second engine was located about 150 ft farther along the debris path. Neither the wings nor the fuselage was intact. The flap setting could not be determined. The landing gear were fractured off from their mounts and located in various parts of the debris field. The landing gear actuator indicated the nose and main landing gear were in the retracted position at the time of impact. The pitch trim actuator indicated the elevator trim tab trailing edge was about 10° tab up. Six propeller blades were recovered, all fractured from their mounts. All blades displayed impact damage, and some displayed leading-edge gouging, chordwise abrasion, twisting and aft bending.

Postaccident wreckage examination was limited by a high degree of fragmentation. Examination of the wreckage revealed that no cockpit instruments were intact. The throttle control quadrant was impact-damaged with the left throttle near idle, the left propeller near feather, and the mixture set full rich for both left and right engines. Flight control continuity could not be confirmed for the elevators, rudder, and ailerons due to impact damage. The rudder trim actuator indicated that the rudder trim tab was about 14° right. The left fuel selector handle was found in the OFF position. The right fuel selector handle was found in the left main position. The left and right fuel selector valves were impact separated and had tumbled through the trees. The left fuel selector valve displayed a witness mark indicating it had been forced from the off position toward the auxiliary tank position.

Both engines exhibited significant impact damage. Continuity of the crankshafts and camshafts on both engines was observed. Thumb compression was achieved for all but one cylinder on the right engine which was impact damaged. Examination of the cylinders using a lighted borescope revealed no anomalies to the pistons and valves. All magnetos sparked at all towers. All spark plugs which remained intact displayed normal coloration when compared to the Champion Check-A-Plug AV-27 chart. Oil filters were opened and found free of debris. Examination of both engines revealed no preimpact anomalies or malfunctions that would have precluded normal operation.

Postaccident examination of the airplane’s heater assembly revealed that it was impact damaged and exhibited deformation of the outer casing, heat exchanger and combustor chamber sections as well as separation of some of the external accessories. The heater assembly did not exhibit any external fire or thermal damage. Detailed examination revealed that the welds and materials comprising the heater were intact and free of defects.

A panel mounted engine data monitor was recovered and examined. The device broke apart during the accident sequence, and although data was recovered, it could not be determined whether this session correlated to the accident event.

Medical and Pathological Information

The Commonwealth of Virginia Office of the Chief Medical Examiner, Western District, performed the pilot's autopsy. According to the autopsy report, the cause of death was blunt force trauma of the head, torso, and extremities, and the manner of death was accident.

The Virginia Department of Forensic Science (DFS) performed toxicological testing of postmortem pooled cavity blood from the pilot. Ethanol was detected at 0.012 g/dL. Carboxyhemoglobin, a marker of CO exposure, was elevated at 31%, as measured by spectrophotometry with confirmation by microdiffusion.

The FAA Forensic Sciences Laboratory also performed toxicological testing of pooled cavity blood from the pilot. Ethanol was not detected at a reporting threshold of 0.01 g/dL. Carboxyhemoglobin testing was performed on five specimens using spectrophotometry. For three of these specimens, carboxyhemoglobin was not detected at a reporting threshold of 10%. The remaining two specimens were unsuitable for measuring carboxyhemoglobin.

Postmortem ethanol production is made more likely by extensive traumatic injury and can cause an affected toxicological specimen to test positive.

Carboxyhemoglobin is formed when CO binds to hemoglobin in blood, impairing the blood's ability to deliver oxygen to body tissues (hypemic hypoxia). CO is an odorless, tasteless, colorless, nonirritating gas that can be produced during hydrocarbon combustion. Exposure to CO usually occurs by inhalation of smoke or exhaust fumes. Symptoms of low-level CO exposure are nonspecific and variable, and may include headache, nausea, and tiredness. Increasing levels of exposure may become impairing or incapacitating, causing more serious neurocognitive, cardiac, and/or vision problems, progressing to death above carboxyhemoglobin levels of about 50% (or lower if other serious medical conditions co-exist), although symptoms are not simply predictable from carboxyhemoglobin levels. Nonsmokers normally have carboxyhemoglobin levels of less than 1-3%, while heavy smokers may have levels as high as 10-15%. As with other causes of tissue hypoxia, CO poisoning may be insidious and difficult for an exposed person to recognize; there is no reliable physical sign of exposure.

Tests and Research

After the accident, electronic CO detectors were installed in the operator's fleet. Research was conducted by the operator at the investigator's request to determine if the engine exhaust could penetrate the cockpit under the specific conditions that were present on the day of the accident. The goal of the research was to determine the ability of CO to enter the cockpit from the engine exhaust during taxi and engine run-up in similar wind conditions and relative wind.

On the day of the of the accident, the reported wind was from 060° true at 7 kts, and the airplane's engines were started on the ramp, where the airplane then taxied to the run-up area of runway 2 for run-up and surveying computer start-up. During this taxi and subsequent run-up, the accident airplane was heading 196º true (205° magnetic), and the relative wind to the airplane was a 44º left quartering tailwind, which would have blown the exhaust from the left engine toward the cockpit and heater air intake at the nose of the airplane. The airplane was on this heading for about 8-10 minutes according to the statement of another company pilot who taxied out in front of the accident airplane and conducted the run-up at the approach end of runway 2 while turned into the wind.

During the test, the exemplar airplane (the same make/model as the accident airplane) was positioned so that the relative wind was also a quartering tailwind. The airplane was equipped with an electronic audible CO detector and the pilot video-recorded the test. The following is an excerpt from the pilot's report:

> *My startup and taxi time was "average". I taxied to runway 18 with the door cracked open and window open due to the heat that day. The heater was left off, including the fan. Neither were turned on. During the taxi, the electronic CO detector read "0" PPM the whole time. As I approached the run-up area, I closed the door and window. Once I got to the run-up area I angled, the airplane close to an east-northeast orientation to put the breeze off my right quartering tail based on the grass and other indicators. Almost immediately, I noticed the audible alarm on the CO detector going off. I looked over and could see the number on the CO detector rising through the 50-60 PPM range. . . it quickly rose above 100 PPM within the 17 second video. At the time, I was unsure what level would be harmful . . . I shut the video off so I could focus on clearing the cabin air. The number eventually climbed up to around 150-160 PPM before finally coming back down. There were very minor exhaust odors present during the high readings.*

Following this research, the operator noted that if the cabin heater had been on the day of the accident, when outside temperatures were 33° F, the heater fan would have drawn in air at the ventilation inlet on the front of the nose. This would have "pushed" the exhaust into the cabin.

Additional Information

FAA Carbon Monoxide and Exhaust System Guidance

On November 24, 1972, the FAA issued advisory circular (AC) 20-32B "Carbon Monoxide (CO) Contamination in Aircraft—Detection and Prevention." The AC provided information on the potential dangers of carbon monoxide contamination from faulty engine exhaust systems or cabin heat exchangers. It also discussed means of detection and procedures to follow when contamination is suspected.

In October 2009, the FAA issued report DOT/FAA/AR-09/49, "Detection and Prevention of Carbon Monoxide Exposure in General Aviation Aircraft." The report documented research on detection and prevention of CO exposure in general aviation aircraft, with the objective of identifying exhaust system design issues related to CO exposure, evaluating inspection methods and maintenance practices with respect to CO generation, and the identification of protocols to quickly alert users to the presence of excessive CO in the cockpit and cabin. On March 17, 2010, the FAA published Special Airworthiness Information Bulletin (SAIB) CE-10-19 R1. It recommended that owners and operators of general aviation aircraft consider the information in the DOT/FAA/AR-09/49 report and use CO detectors while operating their aircraft. The SAIB also recommended a cabin CO level check during every 100-hour or annual inspection, along with continued inspection of the complete engine exhaust system during 100-hr or annual inspections and at inspection intervals recommended by the aircraft and engine manufacturers in accordance with the applicable maintenance manual instructions.

On August 16, 2010, the FAA also published SAIB CE-10-33R1, which reiterated the recommendation to use CO detectors as documented by SAIB CE-10-19R1. It recommended the replacement of mufflers on reciprocating engine-powered airplanes that use an exhaust system heat exchanger for cabin heat with more than 1,000 hours time-in-service (TIS) and at intervals of 1,000 hours TIS. It further recommended following guidance for exhaust system inspections and maintenance provided in SAIB CE-04-22, dated December 17, 2003, and AC 43-16A, Aviation Maintenance Alert, issued October 2006. The FAA also recommended continuing to inspect the complete exhaust system during annual inspections and at intervals recommended by the aircraft and engine manufacturers.

SAIBs are for information only, their recommendations are not mandatory. Likewise, compliance with manufacturer-issued service letters is not mandatory.

National Transportation Safety Board (NTSB) CO and Exhaust System Guidance

On December 20, 2021, the NTSB called on the FAA a second time to require carbon monoxide detectors in general aviation aircraft. In June of 2004, the NTSB issued Safety Recommendation A-04-28 to the FAA to require installation of CO detectors in all single-engine airplanes with forward-mounted reciprocating engines. The FAA declined to require detectors and instead recommended that general aviation airplane owners and operators install them on

a voluntary basis. The FAA also recommended exhaust system inspections and muffler replacements at intervals they believed would address equipment failures before they led to CO poisoning. Because the FAA did not require installation of CO detectors, Safety Recommendation A-04-28 was classified by the NTSB as "Closed – Unacceptable Action."

On January 20, 2022, NTSB Recommendation A-22-001 called on FAA to require that all enclosed-cabin aircraft with reciprocating engines be equipped with a carbon monoxide detector that complies with an aviation-specific minimum performance standard with active aural or visual alerting. Additionally, Recommendation A-22-002 called on the Aircraft Owners and Pilots Association and Experimental Aircraft Association to inform their members about the dangers of CO poisoning in flight and encourage them to 1) install CO detectors with active aural or visual alerting and 2) proactively ensure thorough exhaust inspection during regular maintenance. The Recommendation identified 31 accidents between 1982 and 2020 attributed to CO poisoning. Twenty-three of those accidents were fatal, killing 42 people and seriously injuring four more. A CO detector was found in only one of the airplanes and it was not designed to provide an active audible or visual alert to the pilot, features the NTSB recommended in 2004. In each of these accidents, the pilot was not alerted to CO entering the cabin in enough time to counteract the effects of CO poisoning.

Administrative Information

Investigator In Charge (IIC):	Spencer, Lynn
Additional Participating Persons:	Steve Harness; FAA FSDO; Richmond, VA Rick Roper; RAM Aircraft; Waco, TX Peter Basile; Textron Aviation; Wichita, KS Peter Makredes; Sol Aerial Surveys LLC; Las Vegas, NV
Original Publish Date:	October 5, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=104587

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.