



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Asheville, NC	<b>Accident Number:</b>	ATL05FA013
<b>Date &amp; Time:</b>	10/27/2004, 1050 EDT	<b>Registration:</b>	N611JC
<b>Aircraft:</b>	Beech BE-60	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	4 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Business		

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## Analysis

At about the 3,000-foot marker on the 8,000-foot long runway witnesses saw the airplane at about 100 to 150-feet above the ground with the landing gear retracted when they heard a loud "bang". They said the airplane made no attempt to land on the remaining 5,000 feet of runway after the noise. The airplane continued climbing and seemed to gain a little altitude before passing the end of the runway. At that point the airplane began a right descending turn and was in a 60 to 80 degree right bank, nose low attitude when they lost sight of it. The airplane collided with the ground about 8/10 of a mile from the departure end of runway 34 in a residential area. Examination of the critical left engine found no pre-impact mechanical malfunction. Examination of the right engine found galling on all of the connecting rods. Dirt and particular contaminants were found embedded on all of the bearings, and spalling was observed on all of the cam followers. The oil suction screen was found clean, The oil filter was found contaminated with ferrous and non-ferrous small particles. The number 3 cylinder connecting rod yoke was broken on one side of the rod cap and separated into two pieces. Heavy secondary damage was noted with no signs of heat distress. Examination of the engine logbooks revealed that both engine's had been overhauled in 1986. In 1992, the airplane was registered in the Dominican Republic and the last maintenance entry indicated that the left and right engines underwent an inspection 754.3 hours since major overhaul. There were no other maintenance entries in the logbooks until the airplane was sold and moved to the United States in 2002. All three blades of the right propeller were found in the low pitch position, confirming that the pilot did not feather the right propeller as outlined in the pilots operating hand book, under emergency procedures following a loss of engine power during takeoff.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to follow emergency procedures and to maintain airspeed following a loss of engine power during takeoff, which resulted in an inadvertent stall/spin and subsequent uncontrolled impact with terrain. Contributing to the cause was inadequate maintenance which resulted in oil contamination.

## Findings

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Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF  
Phase of Operation: TAKEOFF - INITIAL CLIMB

### Findings

1. (C) FLUID,OIL - CONTAMINATION,OTHER THAN WATER
  2. (C) MAINTENANCE - INADEQUATE - OTHER MAINTENANCE PERSONNEL
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Occurrence #2: FORCED LANDING  
Phase of Operation: EMERGENCY DESCENT/LANDING

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Occurrence #3: LOSS OF CONTROL - IN FLIGHT  
Phase of Operation: DESCENT - EMERGENCY

### Findings

3. (C) PROCEDURES/DIRECTIVES - NOT FOLLOWED - PILOT IN COMMAND
  4. (C) AIRSPEED - NOT MAINTAINED - PILOT IN COMMAND
  5. STALL/SPIN - INADVERTENT - PILOT IN COMMAND
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Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER  
Phase of Operation: DESCENT - UNCONTROLLED

### Findings

6. TERRAIN CONDITION - GROUND

## Factual Information

### HISTORY OF FLIGHT

On October 27, 2004 at 1050 eastern daylight time, a Beech BE-60, N611JC, registered to a private individual and operated by the airline transport pilot, collided with the ground shortly after takeoff from runway 34, at the Asheville Regional Airport, in Asheville, North Carolina. The business flight was operated under the provisions of Title 14, CFR Part 91, and instrument flight rules. Instrument meteorological conditions prevailed and an instrument flight plan was filed. The airplane sustained substantial damage. The air transport pilot, pilot rated passenger, and two other passengers received fatal injuries. The flight originated from the Asheville Regional Airport Asheville, North Carolina, on October 27, 2004 at the time of the accident.

According to witnesses, the pilot had difficulty starting the right engine. Once it started the pilot immediately taxied to runway 34 and began his takeoff roll. At about the 3,000-foot marker on the 8,000-foot long runway adjacent to taxiway 'K', witnesses saw the airplane at about 100 to 150 feet above the ground with the landing gear retracted when they heard a loud "bang". They said the airplane made no attempt to land on the remaining runway after the noise. The airplane continued climbing and seemed to gain a little altitude before passing the end of the runway. At that point the airplane began a right descending turn and was in a 60 to 80 degree right bank, nose low attitude when they lost sight of it. A few minutes later they heard the fire department responding. The airplane collided with the ground about 3/4 mile from the departure end of runway 34 in a residential area.

### PERSONNEL INFORMATION

A review of information on file with the Federal Aviation Administration Airman's Certification Division, Oklahoma City, Oklahoma, revealed the pilot was issued an Airline Transport Pilot Certificate with ratings for airplane single engine land, airplane multiengine land with type ratings in the HS-125 and Lear Jet. A review of records on file with the FAA Aero Medical Records revealed the pilot held a first class medical certificate issued on February 8, 2004, with a restriction that he must possess glasses for near and intermediate vision. The pilot reported on his application for the medical certificate that he had accumulated 13,400 total flight hours. The pilot's personal logbook was not located for examination.

### AIRCRAFT INFORMATION

Examination of the left and right engine logbooks revealed that both engine's had a factory overhaul on June 26, 1986, by Lycoming Engines, Williamsport, Pennsylvania. On February 12, 1992, the airplane was registered in the Dominica Republic and the last maintenance entry indicated that the left and right engines underwent an inspection and the total time shown on both engines was 754.3 hours since major overhaul. There were no other maintenance entries in the logbooks until the airplane was sold and moved to the United States and issued a standard airworthiness certificate by the Federal Aviation Administration on November 13, 2002, with the registration number N611JC. Examination of the left engine logbook revealed that it was a Lycoming TIO-541-E1C4, SN: RL-1752-59, rated at 380 horse power. The engine total time since overhaul was 829.3 hours as of its last annual inspection dated December 29, 2003. The logbook reflected that the engine hour meter was inoperative as of that date. Examination of the right engine logbook revealed that it was a Lycoming TIO-541-E1C4, SN: RL-1047-59, rated at 380 horse power. The engine total time since overhaul was 829.3 hours

as of its last annual inspection dated December 29, 2003. The logbook reflected that the engine hour meter was inoperative as of that date.

#### METEOROLOGICAL INFORMATION

The nearest weather reporting facility at the time of the accident was Asheville, North Carolina. The 1022 surface weather observation was: wind calm, visibility one and one half statute miles, light rain, mist, ceiling three hundred broken, three thousand seven hundred broken, four thousand six hundred overcast, temperature one five, dew point one three, altimeter three zero two three. The 1054 surface weather observation was: wind calm, visibility one and one half statute miles, mist ceiling five hundred broken, four thousand seven hundred broken, five thousand five hundred overcast, temperature one five, dew point one four, altimeter three zero two three. Instrument meteorological conditions prevailed at the time of the accident.

#### WRECKAGE AND IMPACT INFORMATION

The wreckage was located near a private residence adjacent to a large pasture. The airplane came to rest approximately 8/10 of a mile off the departure end of runway 34. Both propellers were found separated from their engines aft of the propeller mounting flange and were buried in the ground at the initial impact crater. The fuselage and wings were found 47-feet from the propellers, facing on a 120-degree heading. The debris path was orientated on a heading of 040-degrees magnetic.

The forward baggage compartment and nose cone separated from the fuselage and was found under the center section of the fuselage. The forward baggage door separated from the fuselage and was found next to the left propeller. The door exhibited compression damage in an aft direction on the forward edge of the door.

Both wings remained attached to the fuselage. The leading edge of the left wing was crushed aft to the main spar. The left wingtip and winglet separated and were found 34-feet from the main wreckage. The left flap and aileron remained attached to the wing. The left flap actuator measured 1.75-inches, which corresponded to Flaps-up.

The right wing aileron and flap separated from the wing. The wing and right engine cowling was covered with what appeared to be engine oil. The right wingtip separated and was found under the fuselage center section. The right wing exhibited accordion-type crushing in an aft direction from the outboard edge of the engine cowling. The right flap actuator was destroyed.

Flight control continuity was confirmed from both wing aileron bell cranks to the carry through structure. Flight control continuity was confirmed from the elevator and rudder to the forward side of the main spar. The left control column was found intact and attached to the control wheel. The control wheel was found bent to the right, and the right horn had separated. The right control wheel and column were intact. Both control columns were found separated from their flight control cables. The left and right horizontal stabilizers were found attached to the separated section of the aft fuselage. The left elevator remained attached to the stabilizer but had separated into two pieces at the outboard edge of the elevator trim tab. Both elevator counterweights remained attached. The rudder and vertical stabilizer exhibited compression wrinkling on the upper surface but remained attached to the separated section of the fuselage.

The rudder trim actuator measured 3.2-inches, which corresponded to 5-degrees tab right. The elevator trim actuator measured 4.75-inches, which corresponded to 5-degrees tab up. The aileron trim actuator measured 1.5 inches, which corresponded to 2-degrees tab down.

The left main landing gear assembly was found partially extended and attached to the left wing. The tire was inflated, and the rim was found intact. The right main gear was found retracted, and the gear door exhibited very little damage. The nose gear was found separated from the gear strut. The landing gear actuator was examined, and the landing gear was found to be retracted at the time of the impact.

The instrument panel was displaced in an aft direction towards the pilot and copilot seats. Most of the instruments were found separated from the instrument panel. The copilot instrument panel was found in a bush toward the right side of the fuselage.

Examination of the right engine found it attached to the right wing but displaced with the firewall facing opposite toward the rear of the wing nacelle, top side up. The engine was repositioned for initial exam. Engine oil was observed on the cowling, interior, exterior, and right wing outboard surfaces. The oil sump was breached and no oil quantity was remaining. Engine oil was observed on the engine rear accessory section and a hole was observed in the crankcase above the number three cylinder. A connecting rod yoke was observed protruding through the case hole. The connecting rod cap was missing. The engine was recovered for further examination.

Examination of the left engine found it partially separated from the left engine nacelle. The engine was observed with the right side down at rest in the proximity of the left wing. The engine was repositioned for examination. The engine core assembly appeared intact. The oil sump was breached and no oil quantity remained. The engine was recovered for further examination.

On November 16, 2004, both engines and propellers were re-examined at Atlanta Air Recovery, in Griffin, Georgia. Present during the examination were representatives from the NTSB, FAA, Hartzell Propeller, Lycoming Engines and Raytheon Aircraft.

The spark plugs, valve covers and accessory components were removed from the left engine during the examination. The engine crankshaft was rotated establishing internal gear and valve train continuity. All six cylinders produced compression during rotation. Examination of the prop governor control found it in the high RPM position and the unit was fractured into multiple pieces. The gasket screen was found clean. The starter was damaged. The oil cooler was impact damaged and resting against the cylinder. The oil sump was breached. Only residual oil remained within the engine. The oil suction screen was found clean, the oil filter was not located, and the oil cooler was found secure but damaged.

The fuel pump was found secure on the engine case but the hose fittings were broken off. The drive shaft was intact and the unit rotated by hand. The fuel servo and manifold were displaced from their normal positions. Clean blue fuel remained within the unit and the inlet screen was clean. Both magnetos were fractured and separated with damage noted to the flanges with internal damage which precluded bench testing. Spark plugs were found gray in color with moderate to advanced wear, the gaps were normal. The vacuum pump was separated and the drive coupling was damaged. The turbo charger unit was found separated and the hot and cold sections were also separated from each other. The intermediate shaft was broken and there was internal scoring marks found on the compressor housing interior. Both impellers would rotate by hand. The by-pass valve was impact damaged the valve was found closed. The valve arm was bent. The post recovery examination of the left engine revealed no pre-impact mechanical malfunction.

The crankshaft was rotated and except for the number 3 cylinder internal continuity of the right engine was established. The engine crankcase was opened and galling was noted on all of the connecting rods. Dirt and particulate embedment of all of the bearings was noted. Spalling of the cam followers was also noted. The number 3 cylinder connecting rod yoke was broken on one side of the rod cap and separated into two pieces. One bolt & nut assembly remained. One bolt was found broken, and a portion of the bolt with the nut was recovered. The bearing was found fragmented, with less than 50 percent of the bearing material remaining. Heavy secondary damage was noted with no signs of heat distress. The camshaft lobes were found to be severely worn.

Examination of the fuel pump found it intact, the drive coupling was intact and the unit rotated freely. A few drops of clean fuel was found in the injectors. The left magneto remained attached and secure, when bench tested produced spark from all towers. The right magneto was separated and the flange was broken, however, when bench tested produced spark from all the towers. Spark plugs were found gray in color with moderate to advanced wear, the gaps were normal. The started unit was found intact and secure with the drive gear extended. The vacuum pump was found intact and secure, it was removed and the coupling was found intact and the unit rotated freely. The oil suction screen was found clean, The oil filter was found contaminated with ferrous and non-ferrous small particles. The turbo was removed, the bypass valve was free to move and was found open. Closer examination found that the turbo had score marks on the interior of the compressor housing.

Examination of the left propeller blades found the L1 blade bent aft approximately 45-degrees and was not twisted. There was rotational scoring on the camber side and the flat side. The pitch change knob was fractured. The counterweight was intact. L2 blade was bent aft approximately 45-degrees and was not twisted. There was rotational scoring on the flat side. The pitch change knob was fractured. The counterweight was intact. The L3 blade was not bent or twisted. There was rotational scoring in the paint at the leading edge of the camber side. There was rotational scoring on the flat side. The pitch change knob was intact. The counterweight was intact. Examination of the left propeller as observed found the L1 blade in the near feather position, L2 and L3 blades were at a lower blade angle. The piston/cylinder assembly had separated from the propeller. The piston was at a low pitch position in the cylinder. The propeller hub extension was fractured and the mounting flange was missing. The spinner dome was crushed and fragmented. The dome was hydro formed over the L2 blade counterweight. The blade was at a low blade angle position when the damage occurred. The spinner bulkhead was crushed and torn with a portion missing. The pitch change mechanism was seized and cycling of the mechanism was not possible. The air valve was broken and it did not retain its air charge. The engine propeller mounting flange was fractured and the propeller had separated from the engine. The cylinder had separated from the hub and was crushed on the aft end. The aft end of the piston was measured to be 2-5/16- inches from the aft edge of the cylinder corresponding to a low pitch position. The cylinder had to be cut apart to facilitate removal of the piston and feather spring. The cylinder had an installation torque decal and an air charge decal. The piston was intact and unremarkable. The pitch change rod was fractured in three places. It was bent and fractured between the piston and the front of the hub. This was a low pitch position. The rod was fractured on the forward side of the fork, between the fork and internal side of the front hub half. The distance from the fractured end of the fork to the internal side of the front hub half was 22/32-inch. This was a low pitch position. The rod was bent and fractured on the aft end of the propeller, where it exits the rear hub half.

Examination of the right propeller blades found the R1 blade bent aft approximately 10-degrees at 1/3 radius. It was slightly twisted toward low pitch. There was rotational scoring on the leading edge of the camber side. The pitch change knob was fractured. The counterweight was intact. The R2 blade was mildly bent aft approximately 5-degrees. There was light rotational scoring on the camber side. The pitch change knob was intact. The counterweight was intact. The R3 blade was bent aft approximately 30-degrees at 1/4 radius. There was rotational scoring on the leading edge of the camber side. The pitch change knob was fractured. The counterweight was intact. The piston/cylinder assembly had separated from the hub but was retained by the pitch change rod. All three blades were found to be in a low pitch position. The hub extension between the hub and engine flange was fractured and mostly missing. The spinner dome was crushed and fragmented. All three blade counterweights were at a low pitch position when the spinner dome was crushed over the propeller. The propeller cycling pitch change mechanism was seized and cycling of the mechanism was not possible. The cylinder had separated from the hub. The cylinder had to be cut apart to facilitate removal of the piston and feather spring. The cylinder had an installation torque decal and an air charge decal. The pitch change rod was bent on the aft side of the piston, where it exits and front hub half. The aft end of the piston was measured to be 2-11/32-inches to the flat surface of the front hub half. The rod was cut to facilitate disassembly. The rod also had a large radius bend on the aft side of the fork.

#### MEDICAL AND PATHOLOGICAL INFORMATION

The North Carolina Department of Health and Human Services Office of the Chief Medical Examiner, Chapel Hill, North Carolina, conducted a postmortem examination of the pilot on October 27, 2004. The reported cause of death was "Multiple Gross Blunt Trauma", and the manner of death was airplane accident. The Forensic Toxicology Research Section, Federal Aviation Administration, Oklahoma City, Oklahoma performed postmortem toxicology of specimens from the pilot. Tests for carbon monoxide, and cyanide were not performed, no ethanol was detected in the liver and 10(mg/dL, mg/hg) Ethanol was detected in the muscle. However, the report states that the ethanol found in this case was most likely from sources other than ingestion. Additionally, no drugs were detected in the liver.

#### ADDITIONAL INFORMATION

The airplane wreckage was released to the General Manager, Atlanta Air Recovery on November 18, 2004. The parts that were retained for possible examination were released to the Law Offices of Krupnick, Campbell, Malone, Buser, Slama, Hancock, Loberman and McKee on June 2, 2005.

In the Duke B60 Airplane Flight Manual under Section III. Emergency Procedures the following information is provided. Minimum Single-Engine control speed, 98 MPH/85 KTS. Engine failure after lift-off or in flight. The most important aspect of engine failure is the necessity to maintain lateral and directional control, and to achieve and maintain normal take-off airspeed or above. If practicable, an immediate landing should be made. The following procedures provide for minimum diversion of attention while flying the airplane. NOTE: If airspeed is below 98 mph/ 85 kts reduce power on operative engine as required to maintain lateral and directional control. 1. Landing Gear and Flaps- UP; 2. Throttle (inoperative engine) - CLOSE; 3. Propeller (inoperative engine) - FEATHER; 4. Power (operative engine) - AS REQUIRED; 5. Airspeed - AT OR ABOVE NORMAL TAKE-OFF SPEED.

Lycoming Service Instruction No. 1009AR specifies the recommended time between overhaul (TBO) for Lycoming Engines. According to SI 1009AR, TIO-541-E1C4 series engines should be overhauled after the accumulation of 1600 hours time in service since new or previous overhaul. Additionally, engine that do not accumulate the hourly period of time between overhauls as specified, are recommended to be overhauled in the twelfth (12th) year. The 12 year calendar time - recommendation / requirement is because engine deterioration in the form of rust and corrosion can cause abnormal wear of bearings, accelerated cam wear and contributes to the spalling of cam followers.

## Pilot Information

<b>Certificate:</b>	Airline Transport; Flight Instructor	<b>Age:</b>	54, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane Single-engine; Instrument Airplane	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 1 With Waivers/Limitations	<b>Last FAA Medical Exam:</b>	08/01/2004
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	13400 hours (Total, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Beech	<b>Registration:</b>	N611JC
<b>Model/Series:</b>	BE-60	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	P-496
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	6
<b>Date/Type of Last Inspection:</b>	12/01/2003, Annual	<b>Certified Max Gross Wt.:</b>	6775 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	2144 Hours as of last inspection	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	TIO-541-E1C4
<b>Registered Owner:</b>	Jorge Campillo	<b>Rated Power:</b>	380 hp
<b>Operator:</b>	Rafael Zur	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Instrument Conditions	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	AVL, 2165 ft msl	<b>Distance from Accident Site:</b>	0 Nautical Miles
<b>Observation Time:</b>	1022 EDT	<b>Direction from Accident Site:</b>	0°
<b>Lowest Cloud Condition:</b>		<b>Visibility</b>	1.5 Miles
<b>Lowest Ceiling:</b>	Broken / 300 ft agl	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	/	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.23 inches Hg	<b>Temperature/Dew Point:</b>	15° C / 13° C
<b>Precipitation and Obscuration:</b>	Light - In the Vicinity - Fog		
<b>Departure Point:</b>	Asheville, NC (AVL)	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Greensboro, NC (GSO)	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	1050 EDT	<b>Type of Airspace:</b>	

## Airport Information

<b>Airport:</b>	Ashville Regional Airport (AVL)	<b>Runway Surface Type:</b>	Concrete
<b>Airport Elevation:</b>	2165 ft	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	34	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	8001 ft / 150 ft	<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	3 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	4 Fatal	<b>Latitude, Longitude:</b>	35.462222, -82.552778

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Butch Wilson	<b>Report Date:</b>	01/31/2006
<b>Additional Participating Persons:</b>	Robert J Schilling; FAA Charlotte FSDO; Charlotte, NC Timothy D Rainey; Raytheon Aircraft Company (Beech Aircraft); Wichita, KS Ed Rogalski; Lycoming Engines; Belleview, FL Tom McCreary; Hartzell Propeller Inc.; Piqua, OH		
<b>Publish Date:</b>			
<b>Investigation Docket:</b>	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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](#).