



National Transportation Safety Board Aviation Accident Final Report

Location:	Cerrillos, NM	Accident Number:	DEN01FA113
Date & Time:	06/10/2001, 1221 MDT	Registration:	N187AF
Aircraft:	Mitsubishi MU-2B-20	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot was maneuvering the airplane south of the airport preparing to make a VFR approach. Witnesses observed the airplane in a right spin. NTAP data showed the airplane to be well above stall speed before disappearing from radar. Examination of the radar data revealed that in 6 seconds, ground speed dropped 31 knots, from 200 knots to 169 knots, and altitude dropped 440 feet, from 11,760 feet to 11,320 feet (4,400 feet per minute). In the next 6 seconds, ground speed dropped another 31 knots, from 169 knots to 138 knots, and altitude dropped 1,020 feet, from 11,320 feet to 10,300 feet (10,200 feet per minute). According to the manufacturer, if the throttles were to be brought back into Beta (flat pitch) range, it is possible that one propeller could go into Beta an instant before the other propeller. If this were to happen, the airplane would instantly snap roll and enter a spiral. The pilot had received an estimated 4 hours of dual instruction in the airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's loss of aircraft control inflight for reasons undetermined. Contributing factors were the pilot's inadequate transition/upgrade training and his total lack of experience in aircraft make/model.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: MANEUVERING

Findings

1. (C) REASON FOR OCCURRENCE UNDETERMINED
 2. (F) INADEQUATE TRANSITION/UPGRADE TRAINING - PILOT IN COMMAND
 3. (F) LACK OF TOTAL EXPERIENCE IN TYPE OF AIRCRAFT - PILOT IN COMMAND
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Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

4. TERRAIN CONDITION - MOUNTAINOUS/HILLY

Factual Information

HISTORY OF FLIGHT

On June 10, 2001, at 1221 mountain daylight time, a Mitsubishi MU-2B-20, N187AF, registered to and operated by the pilot, was destroyed when it impacted terrain in an uncontrolled descent near Cerrillos, New Mexico. The private pilot and one passenger were fatally injured. Visual meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan had been filed for the personal flight being conducted under Title 14 Code of Federal Regulations (CFR) Part 91. The flight originated in Peoria, Illinois, approximately 0945 central daylight time.

North Point Aviation, Inc., records indicated that on the morning of the accident, the pilot used his personal key to unlock a fuel pump. The airplane was serviced to capacity with 190 gallons of Jet-A fuel. The pilot then telephoned the Kankakee, Illinois, Automated Flight Service Station (AFSS), obtained a standard weather briefing, and filed an IFR flight plan to Santa Fe. The airplane was seen to take off from the Mount Hawley Auxiliary Airport (3MY) between 0930 and 0945 central daylight time. According to a family member, the pilot and his wife were traveling to Santa Fe to celebrate their wedding anniversary.

According to the Federal Aviation Administration (FAA), when the pilot arrived in the Santa Fe area, the Albuquerque Air Route Traffic Control Center (ARTCC) instructed him to enter a holding pattern due to conflicting traffic. He then cancelled his IFR flight plan and was told to contact the Santa Fe tower. An unofficial transcript of radio communications was prepared. Approximately 1218, the pilot contacted the control tower and reported he was 4 miles from the Santa Fe VORTAC. Shortly thereafter, he reported he was 2 miles from the VORTAC. At 1220, the pilot said he was "just going to do a three sixty out here south of the V-O-R and turn around and come back in." This was the last significant transmission from the pilot.

There were several witnesses to the accident, and the following is based on written statements, interviews and telephone conversations. Witness #1 was driving a tractor in the village of Cerrillos. He looked up and saw an airplane, north of the village, "do a couple of motions," then it "headed nose down towards the ground." He said the wings appeared to be "rocking back and forth." Being a volunteer fireman, he responded to the accident site with the fire department after calling 9-1-1 and reporting the accident. Witness #2 was walking near his home when an airplane appeared about 40 to 50 degrees above the horizon. It made an "irregular" sound, "like he was going up and down," and the airplane came down steeply in a right (clockwise) spin. He said both engines were operating, and he attributed the irregular sound he heard "to the change of the sound while it was spinning." Witness #3 was driving north and was approximately 1/2-mile south of Cerrillos when he saw an airplane "going straight down and spinning in a clockwise motion." Three other witnesses were interviewed and their observations were similar.

Witness #4, a Continental Airlines captain, was flying his personal airplane from Aztec, New Mexico, to Alpine, Wyoming. When he was 20 miles southeast of the Santa Fe VORTAC (Very high frequency Omnidirectional Radio range, TACTical air navigation), he noticed "a large black vertical plume of smoke." Albuquerque ARTCC requested that he proceed to the area. He circled the accident site and advised them of the burning wreckage. He said he did not hear any distress call.

According to the New Mexico State Police, the first 9-1-1 call was received at 1223. The accident occurred during the hours of daylight at a GPS (Global Positioning System) location of 35 degrees, 27'33.6" north latitude, and 106 degrees, 06'28.5" west longitude. The accident site was 9.57 miles from the Santa Fe Airport on the 175 degree bearing.

PERSONNEL INFORMATION

The pilot, age 58, an orthodontist, held a private pilot certificate, dated June 20, 1999, with airplane single/multiengine land and instrument ratings. He also held a third class airman medical certificate, dated July 31, 2000, containing the restriction, "Must wear corrective lenses for near and distant vision," along with a waiver for amblyopia.

The pilot's flight logbook was not located during the investigation and documentation of a biennial flight review was not found. However, the multiengine rating, the most recent activity recorded by FAA, was added to the pilot's certificate on June 20, 1999. The practical test was taken in a Beech 95A. According to his application for medical certification, the pilot estimated he had logged 800 total flight hours, of which 100 hours were accrued in the previous six months.

According to N187AF's previous owner in Aiken, South Carolina, the pilot traded his Cessna 414 as a down payment on the MU-2B on April 27, 2001. He attended initial MU-2 training at Howell Enterprises in Smyrna, Tennessee, but was unable to complete the course when he could not obtain insurance on the airplane. Howell Enterprises referred him to a private MU-2 flight instructor in Dickson, Tennessee. The instructor flew with the pilot and family members from Peoria, Illinois, to Lake Placid, New York, and back. According to friends and business associates, the pilot was told not to make the accident trip on at least four different occasions during the week preceding the accident. The flight instructor also told the pilot twice not to go. Estimated dual instruction time that the pilot received in the airplane was 4 hours.

AIRCRAFT INFORMATION

N187AF (s/n 187), an MU-2B-20 (-20 denotes a short bodied airplane), also known as the MU-2F, was manufactured by Mitsubishi Heavy Industries of Japan in 1969. It was equipped with two Garrett (Honeywell) TPE-331-1-151A turboprop engines (s/n P92163C, left; P92164C, right), each rated at 705 eshp (equivalent shaft horsepower), and two Hartzell HC-B3TN-5E propellers (non-counter rotating) with T10178B-11R blades. Each propeller assembly consisted of three all-metal, hydraulically operated, constant speed blades, with full feathering and reversing (Beta) capabilities.

The airplane maintenance records were not located during the investigation.

METEOROLOGICAL INFORMATION

The following METARs (Aviation Routine Weather Report) were recorded at Santa Fe Municipal Airport:

1153: Wind, 200 degrees at 8 knots; visibility, 10 statute miles; sky condition, clear; temperature, 29 degrees C. (84 degrees F.); dew point, -2 degrees C. (28 degrees F.); altimeter setting, 30.17 inches of mercury.

1253: Wind, 250 degrees at 10 knots, gusts to 17 knots; visibility, 10 statute miles; sky condition, clear; temperature, 31 degrees C. (88 degrees F.); dew point, -2 degrees C. (28 degrees F.); altimeter setting, 30.15 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted hilly terrain on a magnetic heading of 200 degrees at a GPS elevation of 6,146 feet msl (above mean sea level). The airplane wreckage was confined to a relatively small area, and was almost completely consumed by an intense ground fire.

The left wing leading edge was crushed rearward to the rear spar. The left aileron trim actuator measured 3.5 inches. The upper surface of the right wing was melted between the fuselage and engine nacelle. The right aileron trim actuator measured 2.5 inches. The traveling nut on the attached right wing flap jackscrew and on the separated left wing flap jackscrew were both measured to be 1.5 inches from the aft bearing housing. According to the manufacturer, this equates to 20 degrees flaps down, or an approach/landing flap setting. The vertical stabilizer and rudder were aligned on a magnetic heading of 193 degrees and were on top of the right horizontal stabilizer and elevator. The left horizontal stabilizer and elevator had been consumed by fire. The elevator trim actuator was extended 1-7/8 inches, and the rudder trim actuator was extended 7.0 inches. The left tip tank and flap separated from the wing and were found in a gully approximately 50 feet northeast of the impact point. The right tip tank separated from the wing and was located approximately 20 feet northwest of the impact point on a small hill. Crush lines on the right tip tank measured approximately 45 degrees. The landing gear was retracted. The swaged ends of the flight control cables were intact and found in the vicinity of the destroyed flight control wheels and rudder pedals.

Both engines were disrupted and exposed internal parts. Rotational scoring of the curvic couplings was noted, and the interlocking teeth were meshed. Metal splatter could be seen on the turbine discs and stators. The left and right power levers were in the FLIGHT IDLE and TAKEOFF positions, respectively. The position of the condition levers could not be determined.

Both propeller assemblies were separated from their respective engines. The left propeller blades bore chordwise scratches on the cambered surfaces and leading edge gouges. One blade was curled. The right propeller blades bore leading edge gouges, and the black paint on the cambered surfaces had been polished off. All of the blades were twisted toward a low pitch setting. One blade was fractured 6 inches from the tip.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the New Mexico State Medical Examiner's Office in Albuquerque. Toxicological protocols were conducted by both the New Mexico State Medical Examiner's Office and FAA's Civil Aeromedical Institute (CAMI). Neither report indicated the presence of ethanol or drugs. Tests for carbon monoxide and cyanide could not be performed.

TESTS AND RESEARCH

On July 19 and 20, the engines and propellers were disassembled and inspected by Honeywell Engines at their facility in Phoenix, Arizona, under the direction of the National Transportation Safety Board. A Federal Aviation Administration aviation safety inspector was also in attendance. According to Honeywell's report, "the type and degree of damage was indicative of engine rotation and operation at the time of impact with the ground. No pre-existing condition was found on either engine that would have interfered with normal operation."

According to Hartzell's report, "Both propellers had power on at the time of impact. No estimate of the preimpact blade angle or amount of power could be made. There were no propeller discrepancies noted that could have precluded normal operation. All damage was

consistent with impact damage."

National Track Analysis Program (NTAP) data was obtained from the Albuquerque ARTCC. According to this data, between 1217:17 and 1220:41, the airplane gradually slowed from 231 knots to 200 knots and descended from 14,300 feet to 11,760 feet. Then, between 1220:41 and 1220:47 (6 seconds), groundspeed dropped 31 knots, from 200 knots to 169 knots, and altitude dropped 440 feet, from 11,760 feet to 11,320 feet (4,400 feet per minute). Between 1220:47 and 1220:53 (6 seconds), groundspeed dropped another 31 knots, from 169 knots to 138 knots, and altitude dropped 1,020 feet, from 11,320 feet to 10,300 feet (10,200 feet per minute). According to the MU-2B Airplane Flight Manual, the stall speed varies between 72 and 85 knots, depending on airplane weight, and between 85 and 120 knots, depending on the angle of bank, with flaps deployed 20 degrees. The airplane, according to the radar data, was above stall speed.

Denver ARTCC's Quality Assurance Division was asked to examine the radar data. The data, in ASCII format, was loaded into Tactical Mapping Software. Aircraft position was depicted using latitude/longitude plots in time sequence. Speed information was then obtained by mathematical calculation of distance traveled. The data can then be animated independently or synchronized with IRIG-B audio data and viewed in three dimensions. Three dimensional viewing was accomplished by utilizing U.S. Geographic Survey elevation data, and can be viewed from any angle. According to their results, between 1220:47 and 1220:53, when the altitude dropped from 11,320 feet to 10,300 feet, the computed descent angle was 33.9 degrees (margin of error + or - 4 degrees). Between that last position and the GPS-derived point of impact, the descent angle was 29 degrees (minimum).

FAA has noted several cases where turboprop pilots have either inadvertently or intentionally positioned the power levers over the flight idle gate while in flight, usually to decelerate and/or lose altitude rapidly, or they may not have appreciated the consequences of their actions. As a result, a series of Airworthiness Directives (A.D.s) were issued in 1997. A.D. 97-25-02 was one of these and affected all MU-2B models. It required the insertion of the following statement into Airplane Flight Manuals (AFMs): "Positioning of power levers below the flight idle stop while the airplane is in flight is prohibited. Such positioning may lead to loss of airplane control or may result in an over speed condition and consequent loss of engine power." This wording was incorporated into the "Limitations" section of the MU-2B-20 AFM by revision in March 1998.

ADDITIONAL INFORMATION

In addition to the Federal Aviation Administration, parties to the investigation included Mitsubishi Heavy Industries of America and Honeywell (Garrett engines).

The wreckage was released to the executor of the pilot's estate on October 18, 2001.

Pilot Information

Certificate:	Private	Age:	58, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	07/31/2000
Occupational Pilot:		Last Flight Review or Equivalent:	06/20/1999
Flight Time:	800 hours (Total, all aircraft), 4 hours (Total, this make and model), 50 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mitsubishi	Registration:	N187AF
Model/Series:	MU-2B-20	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	187
Landing Gear Type:	Retractable - Tricycle	Seats:	9
Date/Type of Last Inspection:		Certified Max Gross Wt.:	9920 lbs
Time Since Last Inspection:		Engines:	2 Turbo Prop
Airframe Total Time:	6500 Hours	Engine Manufacturer:	Garrett
ELT:		Engine Model/Series:	TPE331-1-151A
Registered Owner:	John M. White	Rated Power:	705 hp
Operator:	John M. White	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	SAF, 6348 ft msl	Distance from Accident Site:	
Observation Time:	1153 MDT	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	200°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.17 inches Hg	Temperature/Dew Point:	29° C / -2° C
Precipitation and Obscuration:			
Departure Point:	Peoria, IL (3MY)	Type of Flight Plan Filed:	IFR
Destination:	Santa Fe, NM (SAF)	Type of Clearance:	None
Departure Time:	0945 UTC	Type of Airspace:	Class E

Airport Information

Airport:	Santa Fe Municipal (SAF)	Runway Surface Type:	Unknown
Airport Elevation:	6348 ft	Runway Surface Condition:	Unknown
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	35.459444, -106.100556

Administrative Information

Investigator In Charge (IIC):	Arnold W Scott	Report Date:	07/25/2002
Additional Participating Persons:			
Publish Date:			
Investigation Docket:	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 pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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](#).