



National Transportation Safety Board Aviation Accident Final Report

Location:	Edgartown, MA	Accident Number:	NYC01FA005
Date & Time:	10/06/2000, 2158 EDT	Registration:	N60BT
Aircraft:	Mitsubishi MU-2B-26A	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	4 Fatal

Flight Conducted Under: Part 91: General Aviation - Personal

Analysis

The pilot departed on a night cross-country flight without obtaining a weather briefing or flight plan. Arriving in the area of the destination airport, the weather was reported as, 2 statute miles of visibility and mist; overcast cloud layer at 100 feet. The pilot requested an instrument flight rules clearance from the approach controller, and was vectored and cleared for the ILS 24 approach. The clearance included an altitude restriction of 1,500 feet msl, until the airplane was established on the localizer. As the pilot contacted the control tower, the tower controller issued a low altitude alert to the pilot. The pilot replied that he was climbing and the tower controller cleared the pilot to land, which the pilot acknowledged. No further pertinent radio transmissions were received from the airplane. The airplane came to rest in a wooded area about 3/4-mile from the runway threshold, and about 50 feet right of the extended centerline. Review of the approach plate for the ILS 24 approach revealed that the minimum glide slope intercept altitude at the beginning of the final approach segment on the precision approach was 1,500 feet. The glide slope altitude at the final approach fix for the non-precision approach, which was located about 4 miles from the approach end of the runway, was 1,407 feet. The glide slope altitude at the middle marker, which was located about 0.6 miles from the approach end of the runway, was 299 feet. Review of radar data revealed that the airplane was observed at 700 feet, about 4 miles from the airport, and at 300 feet, about 1.5 miles from the airport. The pilot had accumulated about 1,946 hours of total flight experience, with about 252 hours in make and model. The pilot had attended initial and recurrent training for the make and model airplane; however, did not complete the training.

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 instrument flight procedures resulting in a collision with a tree. A factor related to the accident was the low cloud ceiling.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT

Phase of Operation: APPROACH - FAF/OUTER MARKER TO THRESHOLD (IFR)

Findings

1. LIGHT CONDITION - DARK NIGHT
2. (C) IFR PROCEDURE - NOT FOLLOWED - PILOT IN COMMAND
3. OBJECT - TREE(S)
4. (F) WEATHER CONDITION - LOW CEILING

Factual Information

HISTORY OF FLIGHT

On October 6, 2000, about 2158 eastern daylight time, a Mitsubishi MU-2B-26A, N60BT, was destroyed when it impacted terrain while conducting an instrument approach to the Vineyard Haven Airport (MVY), Edgartown, Massachusetts. The certificated commercial pilot and three passengers were fatally injured. Night instrument meteorological conditions prevailed at the accident site. No flight plan was filed for the personal flight conducted under 14 CFR Part 91.

According to Federal Aviation Administration (FAA) air traffic control transcripts and radar data, the airplane had departed the Trenton Mercer Airport (TTN), Trenton, New Jersey, about 2101, and proceeded in an easterly direction. The last communication from the airplane to the TTN air traffic control tower was about 2103. The next radio communication from the airplane was received by Cape Approach Control, about 2138, in the vicinity of MVY. The pilot requested an instrument flight rules clearance from the approach controller, and was vectored for the ILS Runway 24 approach at MVY. The approach controller issued the pilot an approach clearance about 4 miles from BORST intersection. The clearance included a left hand turn to 230 degrees, and an altitude restriction of 1,500 feet msl, until the airplane was established on the localizer. The pilot acknowledged the clearance and requested the approach controller to repeat the heading for the left turn. The approach controller replied "continue left turn heading of" 220 degrees.

About 7 miles from the airport, the pilot was instructed to contact the MVY air traffic control tower. The pilot contacted the MVY control tower and announced that he was on the ILS 24 approach. The tower controller replied to the pilot to report BORST intersection inbound, which the pilot acknowledged. At 2153:14, the approach controller contacted the tower controller to issue a low altitude alert warning for the accident airplane. The tower controller advised the pilot, "and uh six zero bravo tango approach advises low altitude alert check your altitude immediately altimeter two niner eight seven." The pilot replied "bravo tango climbing up." The tower controller then queried the pilot about what type of aircraft he was, and how long he would be staying on the island. The pilot replied that he was a Mitsubishi and that he would be staying until Monday. At 2154:54, the pilot stated that he was "crossing" BORST intersection. The tower controller cleared the pilot to land, which the pilot acknowledged. No further radio transmissions were received from the airplane.

The airplane came to rest in a wooded area about 3/4-mile from the runway 24 threshold, and about 50 feet right of the extended centerline.

The accident occurred during the hours of darkness, at 41 degrees, 24.40 minutes north latitude, 70 degrees, 35.90 minutes west longitude, at an elevation of 55 feet.

PILOT INFORMATION

The pilot held a commercial pilot certificate with ratings for multi-engine land and single-engine land airplanes. The pilot was also instrument rated. His most recent application for a FAA second-class medical certificate was dated on December 9, 1999.

According to the pilot's logbook, he had accumulated about 1,946 hours of total flight experience, with about 252 hours in make and model. The pilot had also accumulated about 178 hours of night flying experience and about 209 hours of actual instrument flight

experience. His last instrument competency check was completed on January 2, 1999.

Further review of the pilot's logbook revealed a remark, entered during the month of April 1999, stating that the pilot had "completed flight safety MU-2 initial course." A certified flight instructor signed the entry.

A flight instructor, who was employed by the Flight Safety (FS) Houston Learning Center, Houston, Texas, stated that the pilot had attended MU-2 ground school and simulator training early in 1999. At that time, the flight instructor estimated that the pilot arrived at FS with about 1470 hours of total time, and his only experience with turbine aircraft was in a Vampire Jet. During the ground school, the pilot had a positive attitude, but did not meet the minimum standards of FS during the simulator sessions and left without completing the course.

The pilot returned to FS about August 1999, for recurrent training. The flight instructor was tasked with conducting the simulator portion of the training with the pilot. During the simulator training, the pilot needed to be "spoon fed" procedures and techniques, "step by step," in the simulator. He was not near the minimum standards set by FS. The pilot was able to fly the simulator if the weather was VFR and no emergencies occurred. However, when the weather was low or an emergency occurred, the pilot "could not keep the airplane right side up." As the simulator sessions progressed the flight instructor observed the pilot improving in his abilities; however, "he was still a 100 knot pilot in a 300 knot airplane." The pilot did not complete the recurrent training, and departed FS. The flight instructor advised the pilot prior to his departure that he should secure a second qualified pilot to fly with him, and avoid flying in bad weather.

AIRCRAFT INFORMATION

The airplane's maintenance logbooks were not recovered during the investigation.

According to records from a maintenance facility in Rhode Island, the airplane was last maintained on October 4, 2000. The maintenance included a 100-hour inspection, and the repair of the turn and bank indicator. The owner of the maintenance facility stated that the pilot picked up the airplane on October 5, 2000. The maintenance facility owner advised the pilot that the pilot's side horizontal situation indicator (HSI) was still inoperative and suggested that it be removed for repair prior to departing. The pilot replied to the maintenance facility owner that he would have it fixed by another maintenance facility, and that he would fly the airplane as it was. The pilot also added that the upcoming weekend was very important and he did not want the problem with the HSI to ruin it.

An individual, who sold the accident airplane to the pilot, stated that he had conversed with the pilot about 1 week prior to the accident. The conversation included the subject of the pilot's side HSI installed in the airplane. The pilot stated to the salesman that the HSI had been inoperative for about the last 4-5 trips and he was utilizing the instruments on the right pilot's side to fly the airplane during inclement weather conditions. The salesman advised the pilot of several facilities that could fix the HSI, but the pilot replied that he would have the maintenance facility in Rhode Island check it the next time maintenance was performed.

Copies of discrepancies, or "squawks," which were in the pilot's handwriting, outlined problems that included, "Pilot's side HSI does not slave to fluxgate. (Right side HSI slaves fine!) (Pilot's HSI works fine except slaving.) Pilot side ball and needle is frozen inop. (I would prefer a turn coordinator anyway but it sits in a 2 1/2 hole." "Autopilot no problems at all."

METEOROLOGICAL INFORMATION

The weather reported from MVY, at 2153 was, winds from 340 degrees at 12 knots; 2 statute miles of visibility and mist; overcast cloud layer at 100 feet; temperature and dew point of 55 degrees Fahrenheit; and an altimeter setting of 29.86 inches of mercury.

AIDS TO NAVIGATION

About 3 minutes prior to the accident, a "Citation X" jet airplane landed uneventfully at MVY, after conducting the ILS Runway 24 approach. According to an FAA inspector, the runway 24 ILS system was "flight checked" the day after the accident, and no abnormalities were noted.

Review of the approach plate for the ILS Runway 24 approach revealed that the minimum glide slope altitude at the beginning of the final approach segment on the precision approach was 1,500 feet. The glide slope altitude at BORST intersection, which was located about 4 miles from the approach end of the runway, was 1,407 feet. The glide slope altitude at the middle marker, which was located about 0.6 miles from the approach end of the runway, was 299 feet.

WRECKAGE INFORMATION

Examination of the accident site on October 7, 2000, revealed the terrain consisted of low-lying brush, in addition to evergreen and hardwood trees that reached a height of about 40 feet. The evergreen trees, which predominantly surrounded the accident site, had branches of varying diameters, which were cut at 45-degree angles and displayed black paint transfer. The cut branches were located on the ground and snared in other trees along the wreckage path. The first tree strike area was located about 210 feet prior to the main fuselage. The wreckage path was oriented on a 358-degree heading, with the main fuselage coming to rest on a 180-degree heading.

About 22 feet from the first tree strike, a 51-inch section of the left horizontal stabilizer and a 28-inch piece of the left elevator, were located. A large section of an 11-inch diameter tree was found lying on the ground about 13 feet past the horizontal stabilizer. About 4 feet in front of the fallen tree, were the right wing fuel tip tank and an estimated 6-foot section of the outer right wing. The right engine propeller assembly was found about 20 feet beyond the right wing fuel tank, followed by the empennage section, which came to rest 195 feet from the initial tree strike point. The left wing and main fuselage, which came to rest against a hardwood tree, were located about 15 feet beyond the empennage. The right wing inboard section, with the right engine attached to it, came to rest about 10 feet beyond the main fuselage.

Beyond the right wing were large patches of burned grass and fallen leaves, which extended forward about 30 feet.

When the wreckage was examined, the left horizontal stabilizer had an 8-inch deep "u"-shaped dent on the leading edge; about 14 inches from the inboard attach point.

The right wing inboard section sustained damage from a post-crash fire. The right engine remained attached to the inboard section. Examination of the engine revealed that the propeller assembly had separated at the hub assembly, and the two hub locking pins were sheered. The complete engine air intake duct was filled with dirt, leaves, soft broken tree branches, and evergreen tree branches that were cut at 45-degree angles. Examination of the forward compressor impeller revealed damage to seven blades, which were bent opposite to the

direction of rotation. The impeller also exhibited leading edge nicks and gouges on all blades. The right engine propeller assembly exhibited chordwise scratching and curled tips to all four blades. Two propeller blades were bent rearward and the other two were bent forward. The propeller spinner cap remained attached to the assembly, and was crushed upward and inward. The right horizontal stabilizer remained attached to the empennage, and exhibited leading edge damage and crushing. The rudder was deflected to the left, about 10 degrees. The cable controlled rudder trim tab was deflected to the right about 20 degrees. The right elevator was deflected downward about 12 degrees. The emergency locator transmitter was recovered from the empennage section, and found in the off position.

A post-crash fire consumed the main fuselage cabin area. The pilot's altimeter was recovered, but had sustained impact and heat damage. No other flight instruments, which could provide any useful information for the investigation, were located in the wreckage. Impact forces and fire damage destroyed all engine instruments. The "Run Crank Stop" switches, located in the forward section of the main fuselage wreckage, were observed selected to the "Run" position. The throttle quadrant of the central pedestal was recovered and examined. The two power levers were found in the full forward or "TAKEOFF" position. The two condition levers were found in the full forward or "TAKEOFF LAND" position.

The left wing was located parallel and adjacent to the right side of the fuselage. The left engine and propeller assembly remained attached to the wing, but sustained heat damage from the post crash fire. Examination of the left engine propeller blades revealed chordwise s-bending and scratching to all four blades. Two propeller blade tips were bent rearward, one propeller blade tip was melted off, and the fourth propeller was buried in the soil. Examination of the forward compressor impeller on the engine revealed damage to two blades, which were bent opposite to the direction of rotation. The impeller also exhibited leading edge nicks and gouges on all blades.

Continuity of the control cables from the inboard section of the left wing to the spoilers, and trim surfaces was confirmed. Control cable continuity for the right wing was confirmed from the wing separation point to the spoiler and trim surface. The control cable continuity for the rudder, elevator, and trim surfaces located on the tail section of the airplane, were confirmed from the separation point. All cable ends were examined with a 10-power magnifying glass. The cable end strands were cut at 45-degree angles, which were consistent with tension overload, and no corrosion was observed at the separation points.

The landing gear was confirmed in the fully extended position, by noting the jackscrews positioned to the full retract position. The flap position was determined to be 20 degrees, by the position of the left and right flaps and the cockpit flap selector. The mechanical rudder trim indicator in the cockpit was aligned with the 10 degrees nose left position. The rudder trim tab was offset to the right of the rudder, full deflection.

MEDICAL AND PATHOLOGICAL INFORMATION

The Commonwealth of Massachusetts, Department of Health, Office of the Chief Medical Examiner, Pocasset, Massachusetts, performed an autopsy on the pilot, on October 7, 2000.

The FAA Toxicology and Accident Research Laboratory, Oklahoma City, Oklahoma conducted toxicological testing on the pilot.

TEST AND RESEARCH

The pilot's altimeter was retained and sent to the Safety Board's Materials Laboratory for examination.

According to the Metallurgist factual report, the instrument was fire damaged, and the indicated altitude and the altimeter setting number drums could not be observed on the front face of the instrument.

When the instrument was disassembled, and the number drums were removed from the instrument housing, the numbers displayed on front of the altimeter setting drum were "2983."

ADDITIONAL INFORMATION

Radar

Radar information was obtained from the Cape 8 Radar facility, Otis ANGB, Massachusetts. A target identified as N60BT, was observed:

At 2142:08, at an altitude of 7,500 feet, about 16 miles southwest of MVY.

At 2146:03, the target was observed crossing the MVY VOR at 3,000 feet.

At 2148:57, the target was observed at 2,900 feet, on a heading of 088 degrees, about 8 miles east of MVY.

At 2150:08, the target was observed at 1,700 feet, on a heading of 044 degrees, about 10 miles east of the MVY VOR.

At 2150:41, the target was observed at 1,500 feet, on a heading of 331 degrees.

At 2151:42, the target was observed at 1,500 feet, on a heading of 306 degrees.

At 2152:06, the target was observed at 1,400 feet, on a heading of 299 degrees.

At 2152:29, the target was observed at 1,300 feet, on a heading of 233 degrees.

At 2153:02, the target was observed at 900 feet, on a heading of 195 degrees.

At 2153:21, the target was observed at 600 feet, on a heading of 243 degrees.

At 2153:30, the target was observed at 700 feet, on a heading of 250 degrees.

At 2153:40, the target was observed at 700 feet, on a heading of 239 degrees.

At 2153:49, the target was observed at 600 feet, on a heading of 251 degrees.

At 2153:59, the target was observed at 800 feet, on a heading of 244 degrees.

At 2154:32, the target was observed at 900 feet, on a heading of 235 degrees.

At 2154:41, the target was observed about 4 miles from MVY, at 700 feet, on a heading of 245 degrees.

At 2155:00, the target was observed at 700 feet, on a heading of 242 degrees.

At 2155:10, the target was observed at 600 feet, on a heading of 214 degrees.

At 2155:24, the target was observed at 400 feet, on a heading of 229 degrees.

At 2155:38, the target was observed at 400 feet, on a heading of 241 degrees.

At 2155:47, the target was observed at 300 feet, on a heading of 230 degrees.

At 2155:52, the target was observed at 300 feet, on a heading of 207 degrees.

At 2155:57, the target was observed at 200 feet, on a heading of 228 degrees.

There were no further radar contacts.

According to the Aeronautical Information Manual chapter on Navigation Aids, Instrument Landing System (ILS), it stated that "Make every effort to remain on the indicated glide path." It also cautioned the pilot to, "Avoid flying below the glide path to assure obstacle/terrain clearance is maintained."

Wreckage Release

The airplane wreckage was released on October 8, 2000, to a representative of the owners insurance company.

Pilot Information

Certificate:	Commercial	Age:	61, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	12/09/1999
Occupational Pilot:		Last Flight Review or Equivalent:	01/06/1999
Flight Time:	1946 hours (Total, all aircraft), 253 hours (Total, this make and model), 1755 hours (Pilot In Command, all aircraft), 39 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mitsubishi	Registration:	N60BT
Model/Series:	MU-2B-26A MU-2B-26A	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	358SA
Landing Gear Type:	Retractable - Tricycle	Seats:	9
Date/Type of Last Inspection:	10/05/2000, Annual	Certified Max Gross Wt.:	10500 lbs
Time Since Last Inspection:	2 Hours	Engines:	2 Turbo Prop
Airframe Total Time:	5400 Hours as of last inspection	Engine Manufacturer:	Garrett
ELT:	Installed, not activated	Engine Model/Series:	TPE-331
Registered Owner:	KEITH CORP	Rated Power:	665 hp
Operator:	KEITH CORP	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Night/Dark
Observation Facility, Elevation:	MVY, 68 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	2153	Direction from Accident Site:	240°
Lowest Cloud Condition:	Unknown	Visibility	2 Miles
Lowest Ceiling:	Overcast / 100 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	12 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	340°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.86 inches Hg	Temperature/Dew Point:	13°C / 13°C
Precipitation and Obscuration:			
Departure Point:	TRENTON, NJ (TTN)	Type of Flight Plan Filed:	IFR
Destination:	Edgartown, MA (MVY)	Type of Clearance:	IFR
Departure Time:	2101 EDT	Type of Airspace:	Class D

Airport Information

Airport:	Vineyard Haven Airport (MVY)	Runway Surface Type:	Asphalt
Airport Elevation:	68 ft	Runway Surface Condition:	Wet
Runway Used:	24	IFR Approach:	ILS
Runway Length/Width:	5500 ft / 100 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	3 Fatal	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	4 Fatal	Latitude, Longitude:	41.411111, -70.416667

Administrative Information

Investigator In Charge (IIC):	STEPHEN M DEMKO	Report Date:	02/07/2002
Additional Participating Persons:	NANCY RISSO; Bedford, MA Richard Bunker; Massachusetts Aeronautical Commission; Boston, MA Ralph Sorrells; Mitsubishi Heavy Industries; Addison, TX Dave Chapel; Honeywell; Phoenix, AZ		
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/ .		

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