Aviation Investigation Final Report

Location:	MATTAPOISETT, Massachusetts	**Accident Number:**	NYC99FA026
Date & Time:	November 20, 1998, 12:20 Local	**Registration:**	N6820J
Aircraft:	Cessna 414A	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane was level at 2,000 feet, in instrument meteorological conditions, when the pilot reported 'we've just lost our ahh artificial horizon.' About 5 minutes later, air traffic control lost radar contact, and communications with the airplane. A witness about 1 mile north of the accident site stated he heard the sound of engine noise coming from the water and he described the sound as loud and constant. The sound lasted for about 30 seconds and was followed by an 'explosive collision/impact sound.' He further stated he walked to the shore and attempted to locate the source of the sound, but 'because of the fog, I couldn't see anything at all.' The airplane was located in about 25 feet of water, and was scattered over a 150 to 200 foot area. The recovered wreckage consisted of both engines, parts of the airplane's left wing, empennage, fuselage, seats, and interior. The airplane's attitude indicator was not recovered. A faint needle impression was found on the face of the airplane's vertical speed indicator between minus 2,500 and 3,000 feet per minute. Examination of the left and right vacuum pumps did not reveal any malfunctions or failures.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain control of the airplane after an undetermined failure of the airplane's attitude indicator. A factor in this accident was fog.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: CRUISE

Findings
1. (C) FLIGHT/NAV INSTRUMENTS,ATTITUDE INDICATOR - UNDETERMINED

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: CRUISE

Findings
2. (F) WEATHER CONDITION - FOG
3. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
4. TERRAIN CONDITION - WATER

Factual Information

HISTORY OF FLIGHT

On November 20, 1998, about 1220 eastern standard time, a Cessna 414A, N6820J, was destroyed when it impacted water 1/2 mile off shore of Mattapoisett, Massachusetts. The certificated commercial pilot was fatally injured. Instrument meteorological conditions prevailed and an instrument flight rules (IFR) flight plan had been filed for the flight that departed the Barnstable Municipal-Boardman/Polando Airport (HYA), Hyannis, Massachusetts, about 1207, destined for the New Bedford Regional Airport (EWB), New Bedford, Massachusetts. The personal flight was conducted under 14 CFR Part 91.

At 0953, the pilot telephoned the Bridgeport Automated Flight Service Station and received an abbreviated weather briefing. At that time, the pilot filed two IFR flight plans; one from EWB to HYA, and one from HYA to EWB.

At 1025, the pilot departed EWB with a passenger in the accident airplane and flew to HYA, a distance of about 30 nautical miles. The passenger described the flight as normal and uneventful. He also noted that the ceiling was about 800 to 1,000 feet, with a visibility below the clouds of 5 miles. At 1207, the pilot departed HYA, with the intent to return to EWB.

According to the Providence Air Traffic Control Communication Transcript, the pilot contacted the Providence West Low Radar Controller at 1214:49, and said his altitude was 2,000 feet. At 1214:52, the controller provided the pilot the current Providence altimeter setting and asked to be contacted when the pilot had obtained the Automatic Terminal Information Service (ATIS) at EWB. At 1214:59, the pilot stated he had obtained the ATIS information and "...be advised we've just lost our ahh artificial horizon." At 1215:21, the pilot said he was in instrument meteorological conditions. At 1219:18, the controller issued N6820J, a low altitude alert. At 1219:23, the pilot replied "ahh roger correct." There were no further intelligible transmissions from N6820J.

In a telephone interview, a witness located about 1 mile north of the accident site stated he heard the sound of engine noise coming from the water and thought it was a power boat. He described the sound as loud and constant. The sound lasted for about 30 seconds and was followed by an "explosive collision/ impact sound," then all was quiet. He further stated he walked to the shore and attempted to locate the source of the sound, but "because of the fog, I couldn't see anything at all."

The accident occurred during the hours of daylight approximately 41 degrees, 37 minutes north latitude, and 70 degrees, 46 minutes west longitude.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with ratings for airplane single engine land, multi-engine land, and instrument airplane. He also held a flight instructor certificate for airplane single engine and multi-engine land.

The pilot's most recent Federal Aviation Administration (FAA) Second Class Medical Certificate was issued on March 30, 1998, at that time, the pilot reported 3,458 hours of total flight experience.

The pilot's flight logbooks were not located. The airplane was owned by the pilot, and according to the pilot's family, the pilot had flown the airplane about 10 to 15 hours since the last annual inspection, which was performed on October 9, 1998. Review of the airplane's maintenance records revealed the airplane had been flown about 63 hours between the annual inspection in October 1998, and an annual inspection in September 1997.

AIRCRAFT INFORMATION

The airplane was manufactured in 1981, by the Cessna Aircraft Company, Wichita, Kansas. At the time of manufacturer, the airplane's equipment included dual; airspeed indicators, altimeters, and vertical speed indicators. The airplane was also equipped with a vacuum driven Horizontal Situation Indicator, directional gyro, flight director indicator, and an artificial horizon.

Review of the airplane's maintenance records, and information obtained from the FAA, did not revealed any changes to the instrumentation or manner in which the instrumentation was powered.

According to the airplane's maintenance records, at the time of the airplane's last annual inspection, it was reported that the airframe total time was 2,654.8 hours. The airframe total time at the airplane's previous annual inspection, which occurred on September 23, 1997, was 2,591.7.

Records obtained from an avionics maintenance facility at HYA, revealed that on October 20, 1997, a static system check was performed on pilot's and co-pilot's, respective static systems. Additionally, the pilot's and co-pilot's altimeters were bench checked, and the airplane's transponder was tested.

METEOROLOGICAL INFORMATION

The weather reported at EWB, at 1230, was: Visibility 7 miles; Ceiling 1,200 feet broken, 6,000 feet overcast; Temperature 57 degrees F; Dewpoint 54 degrees F.

The weather reported at the Otis Air National Guard Bases (FMH), about 11 miles east

of the accident site, at 1228, was: Visibility 2 miles in mist; Few clouds at 200 feet; Ceiling 400 feet overcast; Temperature degrees 55 F; Dewpoint degrees 52 F.

The weather reported at HYA, at 1234, was: Visibility 3 statue miles, with light rain and mist; Ceiling 300 feet broken, 800 feet overcast; Temperature 55 degrees F; Dewpoint 54 degrees F.

A representative from the United States Coast Guard who participated in the search for the airplane stated that the visibility at the accident site was approximately 1/8 of a mile, in fog.

WRECKAGE AND IMPACT INFORMATION

The airplane was located in about 25 feet of water, about 1/2 mile southwest of Angelica Point, and about 9 miles southeast of EWB. According to recovery personnel, the airplane wreckage was scattered over a 150 to 200 foot area. The recovered wreckage, which consisted of both engines, the right propeller, the empennage, parts of the airplane's left wing, fuselage and the airplane's seats and interior, was examined on November 21 and 23, 1998.

The horizontal stabilizer with elevator attached, was connected to the empennage by the elevator trim cables. The outboard half of the right horizontal stabilizer contained compression wrinkles which increased towards the tip, and progressed to the elevator control surface. The left horizontal stabilizer contained some wrinkling of the skin, but otherwise, was intact. Flight control continuity was confirmed from the rudder control surface to the mid cabin area, and from the elevator bell crank to the mid cabin area.

Both propellers were separated from their respective engines. The left propeller separated from the crankshaft at the propeller mounting flange and was not recovered. The right propeller had separated aft of the propeller mounting flange. Examination of the right propeller revealed one blade had separated about 4 inches from the hub, and was not recovered. The remaining two blades had curled tips and displayed "s" bending.

The left and right engines were rotated by hand via a tool inserted into an accessory drive. Valve train continuity and compression was confirmed to all cylinders of both engines. The top spark plugs of both engines, the number one, three, four and five, cylinder bottom spark plugs from the left engine, and the number one, two, and four, cylinder spark plugs from the right engine were removed and it was noted that their electrodes were intact and dark gray in color. The left and right magnetos of left engine were separated and not recovered. The left magneto of the right engine remained attached; the right magneto was present, but separated.

The left and right vacuum pumps remained attached to their respective engines. The vanes of both vacuum pumps appeared intact and could be rotated by turning their respective drive couplings. Both vacuum pumps were sent to the National Transportation Safety Board's Materials Laboratory for further examination.

Additionally, salvage personal later recovered a vertical speed indicator, and a horizontal situation indicator, which were also sent to the National Transportation Safety Board's Material Laboratory.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on November 21, 1998, by Dr. George Kury, of the Southeastern Medical Examiners Office, Pocasset, Massachusetts.

The toxicological testing report from the FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma, was negative for drugs and alcohol for the pilot.

TESTS AND RESEARCH

Vertical Speed Indicator

According to the NTSB Materials Laboratory Factual Report, the indicating arm of the vertical speed indicator was separated adjacent to the axle. The portion of the needle opposite from the indicating arm was still attached to the axle and moved freely. Examination of the dial face revealed a faint needle impression. The needle impression indicated a vertical speed between minus 2,500 and 3,000 feet per minute.

Horizontal Situation Indicator

According to the NTSB Materials Laboratory Factual Report, the gyro housing was intact and contained no physical damage. Visual examination revealed the interior of the gyro was contaminated with corrosion buildup consistent with exposure to salt water. After ultrasonic cleaning, examination of the gyro rotor and housing revealed no evidence of scoring on the rotor housing interior or damage to the ball bearing shaft of the rotor.

Vacuum Pumps

Further examination of the airplane's left and right vacuum pumps did not reveal any evidence of failures or malfunctions.

ADDITIONAL INFORMATION

Radar

Radar information was obtained from the Boston Air Route Traffic Control Center (ARTCC). A target identified as N6820J, was observed:

At about 1216, at an altitude of 2,000 feet, when it turned northwest towards EWB.

At 1218:00, the target was observed at 1,800 feet.

At 12:18:37, the target was observed at 1,700 feet.

At 1219:05, the target was observed at 1,600 feet, and had turned towards the west.

At 1219:14, the target was observed at 1,200, and had turned towards the southwest.

At 1219:23 and 1219:32, the target was observed at 1,300 feet, and had turned towards the west.

At 1219:42, the target was observed at 700 feet, and had turned towards the north.

There were no further radar contacts.

Wreckage Release

The main airplane wreckage was released on November 23, 1998, to a representative of the salvage company. The parts which were retained were released on August 19, 1999.

Pilot Information

Certificate:	Commercial	**Age:**	57,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	March 30, 1998
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	3458 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N6820J
Model/Series:	414A 414A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	414A0671
Landing Gear Type:	Retractable - Tricycle	**Seats:**	8
Date/Type of Last Inspection:	October 9, 1998 Annual	**Certified Max Gross Wt.:**	7000 lbs
Time Since Last Inspection:	20 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	2675 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	TSIO-520NB
Registered Owner:	GEMCO	**Rated Power:**	310 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	FMH ,132 ft msl	**Distance from Accident Site:**	11 Nautical Miles
Observation Time:	12:28 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Scattered / 200 ft AGL	**Visibility**	2 miles
Lowest Ceiling:	Overcast / 400 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	220°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	13°C / 11°C
Precipitation and Obscuration:	N/A - None - Rain		
Departure Point:	HYANNIS , MA (HYA)	**Type of Flight Plan Filed:**	IFR
Destination:	NEW BEDFORD , MA (EWB)	**Type of Clearance:**	IFR
Departure Time:	12:07 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	NEW BEDFORD EWB	**Runway Surface Type:**	
Airport Elevation:	80 ft msl	**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	

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:**	

Administrative Information

Investigator In Charge (IIC):	Schiada, Luke
Additional Participating Persons:	CHRISTY M MEHEGAN; BEDFORD , MA SETH D BUTTNER; WICHITA , KS GEORGE HOLLINGSWORTH; RESTON , VA RICHARD I BUNKER; BOSTON , MA
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