



National Transportation Safety Board Aviation Accident Final Report

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| Location: | Beaver Island, MI | Accident Number: | CHI01FA083 |
| Date & Time: | 02/08/2001, 1920 EST | Registration: | N318DH |
| Aircraft: | Swearingen SA227-AT | Aircraft Damage: | Destroyed |
| Defining Event: | | Injuries: | 2 Fatal, 2 Serious, 2 Minor |
| Flight Conducted Under: | Part 135: Air Taxi & Commuter - Non-scheduled | | |

Analysis

The airplane was on an on-demand air-taxi flight operating under 14 CFR Part 135 and was destroyed when it impacted trees and terrain while circling to land during a non-precision instrument approach at night. The airplane came to rest 1.74 nautical miles and 226 degrees magnetic from the intended airport. A weather briefing was obtained and instrument meteorological conditions were present along the route of flight at the time of the briefing. Weather conditions for the two reporting stations closest to the destination were obtained by the airplane prior to executing the approach. The weather reports listed ceilings and visibilities as 400 to 500 feet overcast and 5 to 7 statute miles. The airport elevation is 669 feet and the minimum descent altitude for the approach was listed as 1,240 feet. There was no weather reporting station at the destination airport at the time of the accident. According to the operators General Operations Manual, the pilot was responsible for the dispatch of the airplane including flight planning, and confirming departure, en-route, arrival and terminal operations compliance. The manual also states, "For airports without weather reporting, the area forecast and reports from airports in the vicinity must indicate that the weather conditions will be VFR [visual flight rules] at the ETA so as to allow the aircraft to terminate the IFR operations and land under VFR. (Note: a visual approach is not approved without weather reporting)." For 14 CFR Part 135 instrument flight operations conducted at an airport, federal regulations require weather observations at that airport. Furthermore, the regulations state that, for 14 CFR Part 135 operations, an instrument approach cannot be initiated unless approved weather information is available at the airport where the instrument approach is located, and the weather information indicates that the weather conditions are at or above the authorized minimums for the approach procedure. The commercial pilot held a type rating for the accident airplane. The right seat occupant was a commercial pilot employed by the operator and did not hold an appropriate type rating for the accident airplane. The pitch trim selector switch was found set to the co-pilot side. The regulations state that 14 CFR Part 135 operators cannot use the services of any person as an airman unless that person is appropriately qualified for the operation for which the person is to be used. The circling approach was made over primarily unlit land and water. An FAA publication states that during night operations, "Distance may be deceptive at night due to limited lighting conditions. A lack of intervening

references on the ground and the inability of the pilot to compare the size and location of different ground objects cause this. This also applies to the estimation of altitude and speed. Consequently, more dependence must be placed on flight instruments, particularly the altimeter and the airspeed indicator." No anomalies were found with respect to the airframe, engines, or systems that could be associated with a pre-impact condition.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flightcrew not maintaining altitude/clearance during the circling instrument approach. Factors were the pilot in command initiating the flight without proper weather reporting facilities at the destination, the flightcrew not flying to an alternate destination, the flightcrew not following company and FAA procedures/directives, the lack of certification of the second pilot, the operator not following company and FAA procedures/directives, and the dark night and the low ceiling.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: CIRCLING (IFR)

Findings

1. (F) FLT WITH INADQT EN ROUTE/DESTN FACILITIES - INITIATED - PILOT IN COMMAND
2. (F) NOT PERFORMED - FLIGHTCREW
3. (F) LIGHT CONDITION - DARK NIGHT
4. (F) PROCEDURES/DIRECTIVES - NOT FOLLOWED - FLIGHTCREW
5. (F) WEATHER CONDITION - LOW CEILING
6. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - FLIGHTCREW
7. (F) LACK OF CERTIFICATION - COPILOT/SECOND PILOT
8. (F) PROCEDURES/DIRECTIVES - NOT FOLLOWED - COMPANY/OPERATOR MANAGEMENT

Factual Information

HISTORY OF FLIGHT

On February 8, 2001, about 1920 eastern standard time (all times herein are est), a Swearingen SA227-AT, N318DH, operated by Northern Illinois Flight Center (NIFC) and piloted by a commercial pilot, was destroyed when it impacted trees and terrain 1.74 nautical miles and 226 degrees magnetic from the Beaver Island Airport (SJX), Beaver Island, Michigan. The 14 CFR Part 135 on-demand air-taxi flight was operating in instrument meteorological conditions and was on an instrument flight rules (IFR) flight plan. The pilot and pilot rated front seat occupant were fatally injured. Two passengers received minor injuries and two passengers received serious injuries. There were a total of six persons on board the aircraft. The flight departed the Chicago Midway Airport (MDW), Chicago, Illinois, at 1810, with SJX as the intended destination.

According to a certified re-recording from the Kankakee, Illinois, Automated Flight Service Station, a call was received about 1738 to file an IFR flight plan for the accident airplane. During the call, the flight service station specialist issued the current weather conditions for the two reporting stations closest to the destination were given. The weather at Charlevoix, Michigan was given as: Wind 110 at 9 knots; Visibility 10 statute miles; Ceiling 1,100 feet overcast; Temperature 1 degree Celsius; Dew point -1 degree Celsius. The weather at Pellston, Michigan was given as: Wind 110 at 10 knots; Visibility 8 statute miles; Ceiling 900 feet overcast; Temperature 0 degrees Celsius; Dew point -1 degree Celsius.

The airplane was cleared for takeoff from MDW at 1810. The airplane proceeded to fly to SJX. At 1841, the pilot established communications with the Minneapolis Air Route Traffic Control Center (ARTCC). At 1908, the controller cleared the airplane for the instrument approach to SJX.

Aircraft radar track data was obtained from 1833:58 to 1919:53. The last recorded radar return was at 1919:53. The radar data was plotted on the instrument approach procedure chart and on a sectional aeronautical chart using commercial software. These plots are appended to this report. The last recorded radar position was at 45 degrees, 41 minutes, 03 seconds north latitude and 85 degrees, 32 minutes, 12 seconds west longitude. The last radar position is about 1.3 nautical miles and 110 degrees magnetic from SJX.

The chief pilot for the airplane operator stated in a telephone conversation that the pilot of the accident airplane was informed that the flight was only to be executed if visual meteorological weather conditions existed at the destination airport.

PERSONNEL INFORMATION

The pilot held commercial pilot and flight instructor certificates with airplane multiengine land, airplane single engine land, and instrument airplane ratings. The pilot was type-rated in BE-1900 and SA227 aircraft. The pilot held a second-class aviation medical certificate issued on August 17, 2000. The medical certificate listed the restriction, "Must wear corrective lenses."

A written report submitted by the airplane operator states that the pilot had accumulated 6,500 hours total flight time, of which 3,500 hours were in multi-engine airplanes and 250

hours in the same make and model as the accident airplane.

The pilot-rated front seat occupant held a commercial pilot certificate with airplane multiengine land, airplane single engine land, and instrument airplane ratings. He also held a flight instructor certificate with an airplane single engine rating. He was not type-rated in the SA227. He held a first-class aviation medical certificate issued on November 14, 2000. The medical certificate listed the restriction, "Must wear corrective lenses."

A written report submitted by the airplane operator states that the pilot-rated front seat occupant had accumulated 800 hours total flight time, of which 10 hours were in multi-engine airplanes. In a telephone conversation, the chief pilot for the operator stated that the front seat occupant was not a required crew-member and was on the airplane for observation purposes only.

AIRCRAFT INFORMATION

The airplane was a Swearingen model SA227-AT, serial number AT469, manufactured in 1981. The SA227-AT is a twin-engine turboprop aircraft. The fuselage is a semi-monocoque structure. The interior of the airplane was configured to accommodate 12 passengers in addition to the two crew stations. Two Honeywell model TPE331-11U-611G engines, each producing 1,000 shaft-horsepower, powered the airplane.

Maintenance records supplied by the operator state that the airplane had accumulated 7,280.5 hours of flight time. The maintenance records further state that the right and left engines had accumulated 4,222.2 and 4,359.5 hours, respectively, since overhaul.

The NIFC Operations Specifications state that the operator was authorized to use the airplane and its autopilot system in lieu of a second-in-command pilot, provided that the pilot has satisfactorily completed the proficiency check requirements, and the autopilot system is operational.

Documents regarding the seating configuration of the airplane were provided to the NTSB. In a letter to NIFC, a representative of Fairchild Aerospace, the airplane type certificate holder, stated, "We, Fairchild Aerospace, have no technical objections with your plan for an Alternate Configuration B: 9 passenger with couch placarded, not to be occupied for take off and landing." In a letter to the FAA, NIFC stated, "The aircraft will be configured for 9 passengers in accordance with the letter from Fairchild." A letter from the FAA to NIFC stated, "This aircraft must be operated in a factory authorized configuration of 9 passenger seats or less."

METEOROLOGICAL INFORMATION

At the time of the accident, SJX did not have a weather reporting station. According to the instrument approach procedure chart for the NDB or GPS runway 27 approach at SJX, the Pellston altimeter setting is to be used for the approach.

The Pellston, Michigan, surface weather observation station, KPLN, located about 100 degrees true and 35 nautical miles from the accident site recorded the following observations:

Time-1854; type-METAR; wind-130 degrees at 12 knots; visibility-5 miles;
present weather-mist; sky condition-overcast 500 feet; temperature-00
degree Celsius; dew point-00 degree Celsius; altimeter setting-30.09
inches hg.

Time-1954; type-METAR; wind-110 degrees at 11 knots; visibility-5 miles; present weather-mist; sky condition-overcast 500 feet; temperature-00 degree Celsius; dew point-00 degree Celsius; altimeter setting-30.01 inches hg.

The Mackinac Island, Michigan, surface weather observation station, KMCD, located about 075 degrees true and 42 nautical miles from the accident site recorded the following observations:

Time-1855; type-METAR; wind-120 degrees at 4 knots gusting 14 knots; visibility-4 miles; present weather-mist; sky condition-overcast 300 feet; temperature-00 degree Celsius; dew point-00 degree Celsius; altimeter setting-30.08 inches hg.

Time-1955; type-METAR; wind-130 degrees at 10 knots gusting 21 knots wind 110 degrees variable 190 degrees; visibility-10 miles; present weather-none; sky condition-overcast 500 feet; temperature-00 degree Celsius; dew point-minus 01 degree Celsius; altimeter setting-30.00 inches hg.

The Newberry, Michigan, surface weather observation station, KERY, located about 039 degrees true and 39 nautical miles from the accident site recorded the following observations:

Time-1855; type-METAR; wind-110 degrees at 10 knots gusting 16 knots; visibility-2 1/2 miles; present weather-mist; sky condition-overcast 400 feet; temperature-minus 03 degree Celsius; dew point-minus 05 degree Celsius; altimeter setting-30.07 inches hg.

Time-1955; type-METAR; wind-110 degrees at 10 knots; visibility-2 miles; present weather-mist; sky condition-overcast 400 feet; temperature-minus 03 degree Celsius; dew point-minus 04 degree Celsius; altimeter setting-30.00 inches hg.

Additional meteorological information is appended to this report.

COMMUNICATIONS

The airplane was in radio communication with the Minneapolis ARTCC prior to the accident. The following are excerpts from the transcript of those communications.

1841:58 N318DH minneapolis center merlin three one eight delta
hotel with you flight level one nine zero direct to
beaver island

1842:04 ZMP02 november three one eight delta hotel minneapolis

center roger

1846:30 ZMP02 november three one eight delta hotel change to my
frequency one three two point niner

1846:34 N318DH one three two point niner your frequency

1846:40 N318DH and center merlin three one eight delta hotel with
you

1846:47 ZMP02 november eight delta hotel roger

1851:18 N318DH minneapolis center merlin three one eight delta
hotel we would like ah lower altitude if we get it

1851:23 ZMP02 november eight delta hotel pilots discretion
maintain seven thousand pellston altimeter three
zero zero niner

1851:29 N318DH pilots discretion to seven thousand three one eight
delta hotel

1853:36 ZMP02 ah metro eight delta hotel at beaver island there i
got ah one notam for um a lets see here it's for
thin loose snow on runway that's it

1853:46 N318DH okay thank you very much eight delta hotel

1859:00 ZMP02 november three one eight delta hotel descend at
pilots discretion maintain three thousand

1859:05 N318DH pilots discretion to three thousand eight delta
hotel

1900:49 N318DH and eight delta hotel do you have any weather here
at beaver island

1900:55 ZMP02 calling center go ahead

1900:59 N318DH and center this is three one eight delta hotel do
you have any ah nearest weather for beaver island

1901:04 ZMP02 i'll get right back with you here sir it will be
just a minute

1902:37 ZMP02 and three one eight delta hotel i got schoolcraft
weather if you would like it

1902:40 N318DH (unintelligible)

1902:42 ZMP02 yup twenty three thirty five observation at

schoolcraft off the automated winds are one one zero
at one two gusts to one seven visibility seven miles
at a ceiling four hundred overcast temperature minus
one dew point minus one altimeter three zero zero
four

- 1902:58 N318DH all right thank you eight delta hotel
- 1904:31 N318DH and center this is merlin three one eight delta
hotel can i get the pellston weather please
- 1904:37 ZMP02 three one eight delta hotel pellston ah two three
five four observation off the automated winds three
ah one three zero at one two visibility five miles
and mist ceilings are five hundred overcast
temperature zero dew point zero altimeter three zero
zero niner
- 1904:53 N318DH ah roger three one eight delta hotel thanks
- 1908:09 ZMP02 three one eight delta hotel cleared for approach
beaver island maintain at or above ah two thousand
ah five hundred until established on a segment of
the approach
- 1908:18 N318DH okay maintain two thousand five hundred established
cleared for approach eight delta hotel
- 1908:22 ZMP02 eight delta hotel affirmative change to advisory
approved your arrival or cancellation you can
attempt on one thirty four six with cancel otherwise
it will be ah arrival with flight service
- 1908:32 N318DH all right we will try one thirty four six then we
will switch to advisory

The Minneapolis ARTCC received no further communications from the accident airplane.

AIRPORT INFORMATION

The SJX airport has a 4,000 foot by 50 foot paved asphalt runway (runway 09/27), and two intersecting turf runways. The turf runways are listed in the Airport/Facility Directory as being closed between November and April and when the runways are snow covered. The airport is located on the western edge of Beaver Island, Michigan. The western shore of the island is

about 1 mile from the departure end of runway 27. Heavily wooded areas are located to the south and west of the airport. The terrain south and west of the airport is primarily unlit.

The only instrument approach listed for the SJX airport is the NDB or GPS RWY 27 approach. The instrument approach procedure lists a minimum descent altitude of 1,240 feet MSL for both the straight-in runway 27 and circling approaches. The missed approach procedure is listed as "Climb to 2400, then right turn direct SJX NDB and hold." The airport elevation at SJX is 669 feet MSL.

WRECKAGE AND IMPACT INFORMATION

The main wreckage was located in a densely wooded area at a GPS location of 45 degrees 40.277 minutes north latitude and 85 degrees 35.785 minutes west longitude. The first impact point was about 365 feet and 335 degrees magnetic from the main wreckage. All components of the aircraft were located between the first impact point and the main wreckage. The main wreckage site consisted of the entire fuselage and the wings from a point just outboard of the right engine nacelle across the centerline to a point about 9 feet from the left wingtip. The wing structure had separated from the fuselage. The fuselage was oriented on an approximately 155 degree heading and was resting inverted. The forward fuselage was separated from the remainder of the fuselage at a point approximately even with the wing leading edge. The fuselage forward of this point was crushed. The wing center section was lying atop the fuselage and was upright facing approximately opposite of the fuselage orientation. The landing gear was found in the down and locked position. An odor consistent with aviation jet fuel was noted around the accident site. A fluid consistent with jet fuel was leaking from the remains of the left wing fuel tank. Both engines and propellers were found in the immediate area of the main wreckage.

The control system was examined at the accident site. The right rudder cable was found to have a break in the area near the wing leading edge. The left rudder cable had a break in the wing carry-thru area. Both breaks exhibited signatures consistent with overload failure.

The elevator cables were found intact except for a single break in the down elevator cable. The break exhibited signatures consistent with overload failure.

The aileron cables were broken in the wing carry-thru area and exhibited signatures consistent with overload failure. The pushrods from the rudder/aileron interconnect assembly were found broken about 6 inches from the bellcrank. The breaks in both pushrods exhibited signatures consistent with overload and bending.

The examination of the cockpit revealed that the altitude alert was set for 1,100 feet msl, and the pitch trim selector switch was found set to the co-pilot side.

The airframe manufacturer's report of the airframe examination is appended to this report.

No anomalies were found with respect to the airframe that could be associated with a pre-impact condition.

The propellers were examined after removal from the accident scene. The examination of the propellers was conducted under the direct supervision of the NTSB investigator in charge (IIC). No anomalies were found that could be associated with a pre-impact condition. The manufacturer's report of the examination is appended to this report.

The engines were examined at the engine manufacturer's facility under the direct supervision of the NTSB IIC. The engines were disassembled and rotational score marks were found on compressor shrouds and impellers of both engines. Wood debris was found within the combustion section of the engines. Wood debris was also found within the turbine section of both engines. Metal spray deposits were found on various rotating and static components within the turbine section of each engine. No anomalies were found with respect to the engines that could be associated with a pre-impact condition. The manufacturer's report of the examination is appended to this report.

The airplane was equipped with an ACK Technologies model E-01 emergency locator transmitter (ELT), manufactured to comply with FAA Technical Standard Order TSO-C91a. The ELT was found separated from its mounting plate and the battery case was found broken loose from the transmitter assembly. The antenna lead wire was pulled loose from the connector at the ELT. The ELT was mounted in the tail-cone of the airplane near the avionics rack. The mounting straps were examined and no anomalies were noted.

The ELT and its batteries were retained for further examination. The batteries were tested using a digital voltmeter. The voltage reading of all batteries was 1.56 volts. The batteries were reinserted into the battery case and the battery case was manually held in position relative to the transmitter assembly. The ELT was then activated and a signal was detected using a handheld aviation transceiver tuned to a frequency of 121.5 mega-Hertz. The ELT G-switch was tested using the procedures described in FAA Action Notice A 8150.3 and was found to be functioning.

MEDICAL AND PATHOLOGICAL INFORMATION

A "Final Forensic Toxicology Fatal Accident Report" issued by the FAA, for the pilot, was negative for all tests performed.

Spectrum Health of Grand Rapids, Michigan, performed an autopsy of the pilot, on February 12, 2001.

A "Final Forensic Toxicology Fatal Accident Report" issued by the FAA, for the front seat occupant, stated that the volatiles found were caused by the embalming of the body prior to specimen collection.

Spectrum Health of Grand Rapids, Michigan, performed an autopsy of the front seat occupant, on February 13, 2001.

SURVIVAL ASPECTS

A relative of the passengers reported that he saw the airplane fly over the Beaver Island Airport, where he was waiting, but did not land. He said that the airplane flew over about 1920 on February 8, 2001. At 2058 on February 8, 2001, the Ninth District Command Center of the United States Coast Guard received an Alert Notice of a missing aircraft. A search and rescue effort was initiated. According to a report of the search and rescue efforts, the night search efforts, "were hampered and cut short by poor visibility of 1/8 - 1/4 NM [nautical miles] in the search area." The Coast Guard search helicopters resumed their search about 0920 the following morning. At 1035 on February 9, 2001, a commercial air-taxi operator spotted the

wreckage 1.74 nautical miles and 226 degrees from SJX. The search and rescue report states that the survivors were ambulatory and were transported by helicopter to the Charlevoix, Michigan airport where they were transported by ambulance to the Charlevoix Hospital.

One of the surviving passengers said in an interview that her daughter and one of her sons were seated in the forward front-facing seats just aft of the point where the aft fuselage separated from the forward fuselage. She said that after the accident, she and her three children initially stayed under an evergreen tree. She said that when it began raining she and her children went back in the airplane where they huddled together for warmth. She said that they used blankets and cushions as insulation because of the cold weather. She said that about 1000 the morning after the accident, she heard something and inflated a life jacket to use to signal an airplane flying overhead. She said that shortly after signaling the airplane the rescue helicopter arrived. In a later interview, the passenger stated that her daughter was seated in the center couch seat located toward the front of the airplane during the takeoff from MDW.

A weather reporting station located about 35 nautical miles east of the accident site recorded temperatures for the time period beginning at 1854 on February 8, 2001 and ending at 1054 on February 9, 2001 as 0 to 1 degree Celsius.

TESTS AND RESEARCH

A weight and balance calculation form found at the accident site listed the forward and center positions of the 3-seat couch, and the 1-place couch as "Not to be used during Part 135 Operations."

According to the NIFC General Operations Manual (GOM) Chapter 2.4.1:

The PIC [pilot in command] is responsible for the dispatch of the aircraft to which they are assigned for a specific flight using the procedures provided in this manual. Dispatch includes but is not limited to completing airworthiness checks, establishing flight following, completing flight planning requirements, and confirming departure, en route, arrival and terminal operations compliance.

The NIFC GOM further states in Chapter 2.4.7:

In order to depart IFR [instrument flight rules], the destination airport must have an approach procedure suitable for use by the aircraft based upon equipment, forecast winds, terrain, and runway length. The forecast weather conditions at the ETA [estimated time of arrival] must indicate that conditions will be equal to or greater than the visibility minimums for the applicable approach to be used. (135.219) When a forecast is not specifically provided for the destination airport, the forecast can be based upon the current weather conditions, or the area forecasts, or any

combinations of these.

For airports without weather reporting, the area forecast and reports from airports in the vicinity must indicate that the weather conditions will be VFR [visual flight rules] at the ETA so as to allow the aircraft to terminate the IFR operations and land under VFR (Note: a visual approach is not approved without weather reporting). The terminal arrival procedures of this manual must be followed. (2.9, Terminal Operations)

14 CFR Part 135.95 states:

No certificate holder may use the services of any person as an airman unless the person performing those services -

- (a) Holds an appropriate and current airman certificate; and
- (b) Is qualified, under this chapter, for the operation for which the person is to be used.

14 CFR Part 135.99 states:

- (a) No certificate holder may operate an aircraft with less than the minimum flight crew specified in the aircraft operating limitations or the Aircraft Flight Manual for that aircraft and required by this part for the kind of operation being conducted.
- (b) No certificate holder may operate an aircraft without a second in command if that aircraft has a passenger seating configuration, excluding any pilot seat, of ten seats or more.

14 CFR Part 135.113 states:

No certificate holder may operate an aircraft type certificated after October 15, 1971, that has a passenger seating configuration, excluding any pilot seat, of more than eight seats if any person other than the pilot in command, a second in command, a company check airman, or an authorized representative of the Administrator, the National Transportation Safety Board, or the United States Postal Service occupies a pilot seat.

14 CFR Part 135.152 states:

- (a) Except as provided in paragraph (k) of this section, no person may

operate under this part a multi-engine, turbine-engine powered airplane or rotorcraft having a passenger seating configuration, excluding any required crewmember seat, of 10 to 19 seats, that was either brought onto the U.S. register after, or was registered outside the United States and added to the operator's U.S. operations specifications after, October 11, 1991, unless it is equipped with one or more approved flight recorders that use a digital method of recording and storing data and a method of readily retrieving that data from the storage medium. The parameters specified in either Appendix B or C of this part, as applicable must be recorded within the range, accuracy, resolution, and recording intervals as specified. The recorder shall retain no less than 25 hours of aircraft operation.

14 CFR Part 135.153 states:

(a) No person may operate a turbine-powered airplane having a passenger seat configuration of 10 seats or more, excluding any pilot seat, unless it is equipped with an approved ground proximity warning system.

14 CFR Part 135.180 states:

(a) Unless otherwise authorized by the Administrator, after December 31, 1995, no person may operate a turbine powered airplane that has a passenger seat configuration, excluding any pilot seat, of 10 to 30 seats unless it is equipped with an approved traffic alert and collision avoidance system. If a TCAS II system is installed, it must be capable of coordinating with TCAS units that meet TSO C-119.

14 CFR Part 135.213 (b) states:

(b) For the purposes of paragraph (a) of this section, weather observations made and furnished to pilots to conduct IFR operations at an airport must be taken at the airport where those IFR operations are conducted, unless the Administrator issues operations specifications allowing the use of weather observations taken at a location not at the airport where the IFR operations are conducted. The Administrator issues such operations specifications when, after

investigation by the U.S. National Weather Service and the certificate-holding district office, it is found that the standards of safety for that operation would allow the deviation from this paragraph for a particular operation for which an air carrier operating certificate or operating certificate has been issued.

14 CFR Part 135.219 states:

No person may takeoff an aircraft under IFR or begin an IFR or over the top operation unless the latest weather reports or forecasts, or any combination of them, indicate that weather conditions at the estimated time of arrival at the next airport of intended landing will be at or above authorized IFR landing minimums.

14 CFR Part 135.225 states:

(a) No pilot may begin an instrument approach procedure to an airport unless -

(1) That airport has a weather reporting facility operated by the U.S. National Weather Service, a source approved by U.S. National Weather Service, or a source approved by the Administrator; and

(2) The latest weather report issued by that weather reporting facility indicates that weather conditions are at or above the authorized IFR landing minimums for that airport.

(b) No pilot may begin the final approach segment of an instrument approach procedure to an airport unless the latest weather reported by the facility described in paragraph (a)(1) of this section indicates that weather conditions are at or above the authorized IFR landing minimums for that procedure.

14 CFR Part 135.243 states:

(a) No certificate holder may use a person, nor may any person serve, as pilot in command in passenger-carrying operations -

(1) Of a turbojet airplane, of an airplane having a passenger-seat configuration, excluding each crewmember seat, of 10 seats or more, or of a multiengine airplane in a commuter operation as defined in part 119 of this chapter, unless that person holds an

airline transport pilot certificate with appropriate category and class ratings and, if required, an appropriate type rating for that airplane.

FAA publication FAA-H-8083-3-Airplane Flying Handbook states in Chapter 10, Night Operations:

Distance may be deceptive at night due to limited lighting conditions. A lack of intervening references on the ground and the inability of the pilot to compare the size and location of different ground objects cause this. This also applies to the estimation of altitude and speed.

Consequently, more dependence must be placed on flight instruments, particularly the altimeter and the airspeed indicator.

ADDITIONAL INFORMATION

During an interview, one of the surviving passengers stated that the pilot and the front seat occupant were pointing to the left and looking to the left when the initial impact occurred. She said that the airplane was in a left turn when the initial impact occurred. She stated that both men seated in the crew stations were in uniform.

The Federal Aviation Administration, Fairchild Dornier, Honeywell, Dowty Propellers, and the National Air Traffic Controllers Association were parties to the investigation.

The main wreckage was released to a representative of the Charlevoix County Sheriff on February 13, 2001. The remainder of the wreckage was released to a representative of the insurance company on January 11, 2002.

Pilot Information

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| Certificate: | Flight Instructor; Commercial | Age: | 52, 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: | Yes |
| Instructor Rating(s): | Airplane Multi-engine; Airplane Single-engine; Instrument Airplane | Toxicology Performed: | Yes |
| Medical Certification: | Class 2 Valid Medical--w/ waivers/lim. | Last Medical Exam: | 08/17/2000 |
| Occupational Pilot: | | Last Flight Review or Equivalent: | 09/22/2000 |
| Flight Time: | 6500 hours (Total, all aircraft), 250 hours (Total, this make and model), 6400 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 40 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft) | | |

Other Flight Crew Information

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|----------------------------------|---|--|----------------------------|
| Certificate: | Flight Instructor; Commercial | Age: | 23, Male |
| Airplane Rating(s): | Multi-engine Land; Single-engine Land | Seat Occupied: | Right |
| Other Aircraft Rating(s): | None | Restraint Used: | Seatbelt, Shoulder harness |
| Instrument Rating(s): | Airplane | Second Pilot Present: | Yes |
| Instructor Rating(s): | Airplane Single-engine | Toxicology Performed: | Yes |
| Medical Certification: | Class 1 Valid Medical--w/ waivers/lim. | Last Medical Exam: | 01/14/2001 |
| Occupational Pilot: | | Last Flight Review or Equivalent: | 06/08/2000 |
| Flight Time: | 800 hours (Total, all aircraft), 750 hours (Pilot In Command, all aircraft), 195 hours (Last 90 days, all aircraft), 76 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft) | | |

Aircraft and Owner/Operator Information

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| Aircraft Manufacturer: | Swearingen | Registration: | N318DH |
| Model/Series: | SA227-AT | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | No |
| Airworthiness Certificate: | Normal | Serial Number: | AT469 |
| Landing Gear Type: | Retractable - Tricycle | Seats: | 14 |
| Date/Type of Last Inspection: | 11/02/2000, AAIP | Certified Max Gross Wt.: | 14500 lbs |
| Time Since Last Inspection: | 74 Hours | Engines: | 2 Turbo Prop |
| Airframe Total Time: | 7207 Hours | Engine Manufacturer: | Allied Signal |
| ELT: | Installed, not activated | Engine Model/Series: | TPE331 |
| Registered Owner: | Northern Illinois Flight Center | Rated Power: | 1000 hp |
| Operator: | Northern Illinois Flight Center | Air Carrier Operating Certificate: | On-demand Air Taxi (135) |
| Operator Does Business As: | | Operator Designator Code: | NTFA |

Meteorological Information and Flight Plan

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|----------------------------------|-------------------------|-------------------------------|-------------|
| Conditions at Accident Site: | Instrument Conditions | Condition of Light: | Night/Dark |
| Observation Facility, Elevation: | PLN, 720 ft msl | Observation Time: | 1954 EST |
| Distance from Accident Site: | 35 Nautical Miles | Direction from Accident Site: | 100° |
| Lowest Cloud Condition: | Unknown | Temperature/Dew Point: | 0° C / 0° C |
| Lowest Ceiling: | Overcast / 500 ft agl | Visibility | 5 Miles |
| Wind Speed/Gusts, Direction: | 11 knots, 110° | Visibility (RVR): | |
| Altimeter Setting: | 30.01 inches Hg | Visibility (RVV): | |
| Precipitation and Obscuration: | | | |
| Departure Point: | Chicago, IL (MDW) | Type of Flight Plan Filed: | IFR |
| Destination: | Beaver Island, MI (SJX) | Type of Clearance: | IFR |
| Departure Time: | 1810 EST | Type of Airspace: | Class G |

Airport Information

| | | | |
|----------------------|---------------------|---------------------------|--|
| Airport: | BEAVER ISLAND (SJX) | Runway Surface Type: | Asphalt |
| Airport Elevation: | 669 ft | Runway Surface Condition: | Snow--compacted |
| Runway Used: | 27 | IFR Approach: | ADF/NDB; Circling; Global Positioning System |
| Runway Length/Width: | 4000 ft / 50 ft | VFR Approach/Landing: | |

Wreckage and Impact Information

| | | | |
|---------------------|-----------------------------|----------------------|-----------------------|
| Crew Injuries: | 2 Fatal | Aircraft Damage: | Destroyed |
| Passenger Injuries: | 2 Serious, 2 Minor | Aircraft Fire: | On-Ground |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 2 Fatal, 2 Serious, 2 Minor | Latitude, Longitude: | 45.671389, -85.596389 |

Administrative Information

| | | | |
|-----------------------------------|--|---------------|------------|
| Investigator In Charge (IIC): | John M Brannen | Adopted Date: | 07/02/2002 |
| Additional Participating Persons: | Jack D Morgan; Fairchild Aerospace; San Antonio, TX Darren T Gaines; National Air Traffic Controllers Association; Washington, DC Peter B Baker; Honeywell - Engines and Systems; Phoenix, AZ Donald W Finney; FAA-Grand Rapids, Michigan-FSDO; Grand Rapids, MI Robert Morgan; Dowty Propellers; Sterling, VA | | |
| 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.