



National Transportation Safety Board Aviation Accident Final Report

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|--------------------------------|-----------------------------------------------|-------------------------|------------|
| Location: | RENO, NV | Accident Number: | LAX95FA141 |
| Date & Time: | 03/22/1995, 0812 PST | Registration: | N9417B |
| Aircraft: | Cessna 208B | Aircraft Damage: | Destroyed |
| Defining Event: | | Injuries: | 1 Fatal |
| Flight Conducted Under: | Part 135: Air Taxi & Commuter - Non-scheduled | | |

Analysis

Approaching Reno, the pilot received an instrument clearance to perform a Localizer DME-1, Rwy 16R, approach, which the FAA had previously approved for the operator's use. The localizer centerline passed over a 6,161-foot msl mountain, which was depicted on the chart. The pilot was familiar with the area, having transported cargo from Sacramento to Reno for 5 days each week since December, 1994. IMC existed and light snow showers were present. ATC issued the pilot a series of instructions as he was radar vectored toward the final approach fix (FAF), which had a minimum crossing altitude of 6,700 feet msl. The pilot misstated four of the instructions during clearance readbacks and was corrected by ATC each time. Contact with the pilot was lost following issuance of his landing clearance. The airplane impacted the mountainside at an elevation of about 6,050 feet, while tracking inbound near the centerline of the localizer course, about 2.7 nautical miles before reaching the FAF. The airframe, engine, and avionics equipment were examined. No mechanical malfunctions were found.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's failure to comply with published instrument approach procedures by a premature descent below the minimum altitude specified for the approach.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: APPROACH - IAF TO FAF/OUTER MARKER (IFR)

Findings

1. WEATHER CONDITION - SNOW
2. WEATHER CONDITION - LOW CEILING
3. TERRAIN CONDITION - HIGH TERRAIN
4. RADIO COMMUNICATIONS - NOT UNDERSTOOD - PILOT IN COMMAND
5. (C) IFR PROCEDURE - IMPROPER - PILOT IN COMMAND
6. (C) ALTITUDE - NOT OBTAINED/MAINTAINED - PILOT IN COMMAND
7. (C) DESCENT - PREMATURE - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On March 22, 1995, at 0812 hours Pacific standard time, a Cessna 208B, N9417B, operated by Union Flights on a FAR Part 135 air taxi cargo flight for Airborne Express, collided with a mountain on final approach to the Reno Cannon International Airport, Reno, Nevada. Instrument meteorological conditions prevailed, and an IFR flight plan was filed. The airplane was destroyed, and the airline transport certificated pilot was fatally injured. The flight originated at 0734 from Sacramento, California, as flight number 9840.

According to the Federal Aviation Administration (FAA), all communications and services with flight 9840 were routine upon departure from Sacramento. At 0803:28, as flight 9840 approached Reno, the pilot made the following transmission to the radar controller: "ah Reno Approach Union Flight ninety eight forty is with you. I have Romeo and request ah localizer DME one for runway one six." The controller responded by providing a radar approach vector to the pilot.

Thereafter, in reply to a series of air traffic control instructions, the pilot made a series of statements which were subsequently corrected by the radar controller. For example, at 0805:28 the controller instructed the pilot to "descend and maintain niner thousand five hundred." The pilot responded that he was "out of nine thousand five hundred." The controller corrected the pilot.

At 0808:28, the controller cleared the pilot to "descend and maintain eight thousand two hundred." The pilot acknowledged the instruction with "down to seven thousand." The controller corrected the pilot.

At 0809:26, the controller instructed the pilot to turn to a heading of "one four zero." The pilot replied with "one two zero," and the controller again corrected the pilot.

At 0810:31, the controller made the following transmission to the pilot: "Union Flight ninety eight forty one two miles from the airport maintain seven thousand two hundred til established on the localizer cleared localizer DME one runway one six right approach circle one six left."

The pilot replied: "Cleared for ah ILS ah one six er ah localizer DME one and ah circle to one six left ninety eight forty."

The pilot then contacted the Reno Airport Tower local controller and at 0811:58 stated: "Reno Tower Union Flight ninety eight forty is ah localizer inbound full stop." The local controller cleared the pilot to land on runway 16 left. There were no further contacts with the pilot.

PERSONNEL INFORMATION

The pilot held airline transport pilot, certified flight instructor, and mechanic certificates. According to the operator, his total flight time was about 4,388 hours, and his total experience flying Cessna 208 airplanes was about 200 hours.

Based upon resume data from the pilot, the National Transportation Safety Board estimated that his combined actual and simulated instrument experience was 300 hours.

The pilot last completed required FAR Part 135 competency/proficiency flight training on October 10, 1994. The training was performed in a Piper PA-31 airplane. The pilot last completed required FAR Part 135 flight training in a Cessna 208 on June 30, 1994.

The Safety Board reviewed copies of pilot flight hour and maintenance records which the operator maintained for the months of December, 1994, through February, 1995. The records indicated that during this period the pilot flew Cessna 208 airplanes for an estimated 110 hours.

During February, 1995, the pilot flew the accident airplane on at least 12 different occasions which included performance of at least three instrument approaches. Regarding the pilot's flying experience along the accident route of flight, the operator reported that the pilot had flown the route between Sacramento and Reno "5 days each week since December 1994."

AIRPLANE INFORMATION

According to the FAA, its review of the airplane's maintenance records revealed that all pertinent airworthiness directives had been complied with. The Safety Board noted that no outstanding discrepancies (squawks) were observed written in the original airplane maintenance record log sheet page which was found at the crash site.

Airborne Express load manifest data indicated that prior to takeoff, about 2,650 pounds of cargo was placed onboard the airplane. No hazardous material was identified.

METEOROLOGICAL INFORMATION

At 0459 the pilot received a telephone weather briefing from the FAA's Rancho Murieta Flight Service Station (FSS). In pertinent part, the briefer informed the pilot that along the route of flight between Sacramento and Reno, between the pilot's proposed 0700 departure time and 0800 arrival time, he could expect to encounter occasional moderate to severe turbulence and occasional icing conditions. The 0800 terminal forecast for Reno indicated an overcast ceiling at 4,000 feet above ground level (agl), surface winds from 170 degrees at 14 knots with gusts to 24 knots, and occasional sky partially obscured with ceilings of 1,500 feet overcast, 2 miles visibility, and light snow.

Between 0750 and 0813, Reno Airport's weather was variable. The base of the overcast ceiling increased from 1,600 to 1,900 feet; the visibility increased from 2.5 to 3 miles; the southerly wind decreased in speed from 42 to 27 knots; the atmospheric pressure decreased from 29.59 to 29.58" Hg; and the amount of sky hidden by snow decreased from 0.5 to 0.1, respectively.

At 0812:03, when the Reno Airport tower controller cleared the pilot to land, the controller reported that the wind direction was from 170 degrees at 25 knots.

Several minutes after the accident another of the operator's Cessna 208 airplanes landed at Reno. The Cessna pilot reported that during his instrument approach he had encountered light chop and light rime icing.

AIDS TO NAVIGATION

During the pilot's preflight weather briefing, the FSS briefer advised the pilot that the ILS glideslope at Reno was out of service.

In March, 1993, the operator received permission from the FAA to utilize a special terminal instrument approach procedure (IAP) at Reno. The IAP was entitled "LOC DME-1 Rwy 16R."

As noted in the IAP chart (see attached copy), while flying inbound on the 164-degree final approach segment, pilots were not permitted to be at an altitude lower than 6,700 feet mean sea level (msl) until crossing the Dicey Intersection final approach fix.

While tracking inbound on the Reno localizer, an airplane's position at the Dicey Intersection can be determined by the following two methods: (1) Upon noting that the distance measuring equipment (DME) indicates a distance of 7.7 nautical miles; and/or (2) upon noting passage of the 295-degree radial from the Mustang VOR (navigation aid).

WRECKAGE AND IMPACT INFORMATION

From an examination of the accident site and airplane wreckage, the airplane was found to have collided with a 21-degree upsloping snow-covered terrain on the north side of a mountain. The mountain's peak elevation was depicted on the centerline of the Reno Airport's LOC DME-1 RWY 16R IAP chart. Its charted elevation was 6,161 feet msl. The crash site elevation was estimated at 6,050 feet msl.

The location of the accident site, as determined by global positioning system (GPS) measurements, was about 39 degrees, 39.1 minutes north latitude, by 119 degrees, 46.2 minutes west longitude. The site was 9.17 nautical miles (NM) and 343 degrees (magnetic) from the center of the airport. The magnetic bearing and distance from the Mustang VOR to the accident site was 308 degrees and 8.93 NM. The bearing and distance from the accident site to the Dicey Intersection final approach fix was 163 degrees and 2.66 NM. (See the IAP chart for additional details.) The initial point of impact (IPI) was marked by the presence of several tree branches which had been severed (see the wreckage diagram). Several yards south of the IPI, pieces of the fragmented belly-mounted cargo pod and assorted cargo were found in the snow-covered hillside.

The main wreckage was found about 81 feet and 168 degrees (magnetic) from the IPI. The cockpit was found right side up, and was oriented toward a magnetic heading of 310 degrees. The empennage, which was found attached to the fuselage, was found upside down. The aft fuselage was observed buckled near the leading edge of the dorsal fin's attachment point, in the vicinity of where the emergency locator beacon transmitter (ELT) was installed (see the Caravan Weight and Balance Data Sheet, and photographs).

The airplane's right wing was observed broken from its attachment fittings, and it was found next to the right side of the fuselage. The left wing, and fragments from the splintered composite material propeller blades, were found about 11 feet north-northeast of the main wreckage. All of the airplane's flight control surfaces were located in the vicinity of the accident site. There was no evidence of fire.

The omni bearing course selector (OBS) for the number two navigation receiver was observed set to a course of 295 degrees.

MEDICAL AND PATHOLOGICAL INFORMATION

An acquaintance of the pilot reported that the pilot had been in good health. The pilot did not smoke or take medications.

On March 23, 1995, an autopsy was performed by the Washoe County Medical Examiner\Coroner, Reno, Nevada. Results of toxicology tests performed by the Armed Forces Institute of Pathology were negative for ethanol and all screened drugs.

TESTS AND RESEARCH

The pilot's (left side) altimeter was examined under the Safety Board's direction on April 5, 1995. The examination was performed under FAA observation at United Altimeter's Wichita,

Kansas, facilities. The FAA reported that, upon initial testing, the altimeter was found to have sustained damage which rendered it inoperative. The subsequent teardown examination revealed internal components had received impact damage. No impact-related needle (pointer) slap mark was detectable. No evidence of preimpact internal component failures were found.

On July 20, 1995, under Safety Board observation, a partial teardown examination of the engine was performed at Pratt & Whitney Canada's Los Alamitos, California, service center. Following the examination, Pratt & Whitney issued a report which stated the following: "The engine displayed rotational signatures to the internal components characteristic of the engine developing power at impact, likely in a low to middle power range. There were no indications of any anomalies or distress observed to the engine components examined that would have precluded normal operation prior to impact."

Under FAA observation, on February 27, 1996, avionics equipment consisting of the airplane's Bendix radios, the DME, and the horizontal situation indicator (HSI) were examined at Allied Signal's (formerly Bendix) Olathe, Kansas, facilities. Allied Signal reported that due to the extent of impact-related damage, functional testing of the HSI was precluded from being accomplished. The DME indicator display head was powered up and was found functional. The number two (digital) navigation receiver was found functional. It was observed set to the Mustang VOR on the assigned frequency of 117.9 MHZ. No evidence of preimpact failures were observed during the tests. (See the attached Allied Signal report for additional details.)

ADDITIONAL INFORMATION

The main wreckage was verbally released to the owner's assigned insurance representative following completion of the July, 1995, teardown examination. On February 28, 1996, the altimeter, avionics equipment, and related maintenance and airplane/operator papers were released. No parts or documents were retained by the Safety Board.

Pilot Information

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|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------|
| Certificate: | Airline Transport; Flight Instructor | Age: | 43, 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): | Airplane Multi-engine; Airplane Single-engine; Instrument Airplane | Toxicology Performed: | Yes |
| Medical Certification: | Class 1 Valid Medical--no waivers/lim. | Last FAA Medical Exam: | 10/31/1994 |
| Occupational Pilot: | | Last Flight Review or Equivalent: | |
| Flight Time: | 4388 hours (Total, all aircraft), 200 hours (Total, this make and model), 126 hours (Last 90 days, all aircraft), 1 hours (Last 24 hours, all aircraft) | | |

Aircraft and Owner/Operator Information

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|-------------------------------|--------------------------------------------------|--------------------------------|--------------------------|
| Aircraft Make: | Cessna | Registration: | N9417B |
| Model/Series: | 208B 208B | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | No |
| Airworthiness Certificate: | Normal | Serial Number: | 208B0065 |
| Landing Gear Type: | Tricycle | Seats: | 2 |
| Date/Type of Last Inspection: | 02/07/1995, AAIP | Certified Max Gross Wt.: | 8750 lbs |
| Time Since Last Inspection: | 67 Hours | Engines: | 1 Turbo Prop |
| Airframe Total Time: | 4959 Hours | Engine Manufacturer: | P&W |
| ELT: | Installed, activated, aided in locating accident | Engine Model/Series: | PT6A-114 |
| Registered Owner: | ALCOHOL AVIATION FUELS, INC. | Rated Power: | 600 hp |
| Operator: | UNION FLIGHTS | Operating Certificate(s) Held: | On-demand Air Taxi (135) |
| Operator Does Business As: | | Operator Designator Code: | UNIA |

Meteorological Information and Flight Plan

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|----------------------------------|--------------------------------|--------------------------------------|------------------|
| Conditions at Accident Site: | Instrument Conditions | Condition of Light: | Day |
| Observation Facility, Elevation: | RNO, 4412 ft msl | Distance from Accident Site: | 9 Nautical Miles |
| Observation Time: | 0812 PST | Direction from Accident Site: | 163° |
| Lowest Cloud Condition: | Partial Obscuration / 0 ft agl | Visibility | 3 Miles |
| Lowest Ceiling: | Overcast / 1900 ft agl | Visibility (RVR): | 0 ft |
| Wind Speed/Gusts: | 25 knots / | Turbulence Type Forecast/Actual: | / |
| Wind Direction: | 170° | Turbulence Severity Forecast/Actual: | / |
| Altimeter Setting: | 29 inches Hg | Temperature/Dew Point: | 1°C / -3°C |
| Precipitation and Obscuration: | | | |
| Departure Point: | SACRAMENTO, CA (SMF) | Type of Flight Plan Filed: | IFR |
| Destination: | (RNO) | Type of Clearance: | IFR |
| Departure Time: | 0734 PST | Type of Airspace: | Class E |

Airport Information

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|----------------------|---------------------------------|---------------------------|----------------|
| Airport: | RENO CANNON INTERNATIONAL (RNO) | Runway Surface Type: | Concrete |
| Airport Elevation: | 4412 ft | Runway Surface Condition: | |
| Runway Used: | 16L | IFR Approach: | Localizer Only |
| Runway Length/Width: | 9000 ft / 150 ft | VFR Approach/Landing: | None |

Wreckage and Impact Information

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

Administrative Information

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|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------|
| Investigator In Charge (IIC): | WAYNE POLLACK | Report Date: | 09/19/1996 |
| Additional Participating Persons: | REID WALBURG; RENO,, NV CHUCK MOTE; PALMDALE,, CA TOM BERTHE & PAUL CROSBY; QUEBEC, CANADA, CLAUD UNDERWOOD; WICHITA,, KS | | |
| 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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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](#).