National Transportation Safety Board
Aviation Accident Final Report

Location:	EL PRADO, NM	**Accident Number:**	FTW95FA130
Date & Time:	03/05/1995, 1355 MST	**Registration:**	N421BL
Aircraft:	CESSNA 421C	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

THE PILOT OBTAINED A WEATHER BRIEFING FOR THE IFR FLIGHT TO TAOS, NEW MEXICO, AND WAS ADVISED OF FORECAST CONDITIONS FOR LIGHT TO MODERATE RIME ICING AND MODERATE TURBULENCE AT HIS DESTINATION. DURING DESCENT, ABOUT 30 NM EAST OF THE TAOS VOR, AT 15,200 FEET, THE PILOT REPORTED 'LIGHT RIME ICING' AND 3 MINUTES LATER 'FREEZING RAIN.' THE AIRPLANE WAS CLEARED FOR THE VOR DME-B APPROACH TO THE TAOS AIRPORT, AND RADAR SERVICES WERE TERMINATED. THE AIRPLANE IMPACTED THE GROUND IN A STEEP NOSE DOWN ATTITUDE 7 NM SE OF THE VOR AND 1 NM RIGHT OF THE INBOUND APPROACH COURSE . WEATHER DATA INDICATED THAT THE AIRPLANE ENTERED CLOUDS ABOUT 6 NM EAST OF WHERE 'LIGHT RIME' WAS REPORTED AND REMAINED IN THE CLOUDS UNTIL IT DESCENDED BELOW 10,000 FEET. METEOROLOGICAL INVESTIGATION INDICATED THAT THE FREEZING LEVEL WAS ABOUT 10,700 FEET. RADAR DATA REVEALED CYCLIC VARIATIONS IN THE AIRPLANE'S GROUNDSPEED FROM 120 TO 190 KNOTS, AS IT CROSSED THE HIGH MOUNTAIN RANGE EAST OF TAOS. THERE WAS A PIREP OF SEVERE TURBULENCE ON THE EASTERN SLOPE OF THE MOUNTAIN RANGE.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: THE PILOT'S DECISION TO CONTINUE FLIGHT INTO KNOWN ADVERSE WEATHER CONDITIONS AND THE ENSUING INADVERTENT STALL DUE TO AIRFRAME ICE. FACTORS WERE THE WEATHER CONDITIONS.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: DESCENT - NORMAL

Findings
1. (F) WEATHER CONDITION - MOUNTAIN WAVE
2. (F) WEATHER CONDITION - CLOUDS
3. (F) WEATHER CONDITION - FREEZING RAIN

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH - IAF TO FAF/OUTER MARKER (IFR)

Findings
4. (C) FLIGHT INTO KNOWN ADVERSE WEATHER - CONTINUED - PILOT IN COMMAND
5. (C) AIRFRAME - ICE
6. STALL - INADVERTENT - PILOT IN COMMAND

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

Factual Information

HISTORY OF FLIGHT

On March 5, 1995, approximately 1355 mountain standard time, a Cessna 421C, N421BL, was destroyed following a loss of control during approach to the Taos Municipal Airport near El Prado, New Mexico. The commercial instrument rated pilot and his three passengers were fatally injured. An instrument flight plan was filed for the 14 CFR Part 91 personal flight which departed Will Rogers World Airport in Oklahoma City, Oklahoma, at 1207 central standard time. Instrument meteorological conditions prevailed for the approach to Taos.

At 0759 central standard time (CST), the pilot telephoned the McAlester Automated Flight Service Station and requested a standard weather briefing from Oklahoma City to Taos. During the briefing, the pilot was advised of forecast conditions for light to moderate rime icing and moderate turbulence at his destination. At the conclusion of the briefing, the pilot filed an IFR flight plan with a proposed departure time of 1200 CST. While en route, at 1307 mountain standard time (MST), the pilot requested the current weather at Taos, and was given the 1254 MST observation of "measured ceiling one thousand nine hundred broken, two thousand five hundred overcast, visibility ten, temperature forty one, dew point thirty four, altimeter two nine eight eight."

According to radar track data, during the period of time from about 1324 to 1344 MST, the airplane passed over the Sangre de Cristo mountain range, which contains numerous peaks with elevations greater than 12,000 feet. During this period, as shown on the attached Data Analysis and Reduction Tool (DART) printout, cyclic variations in the airplane's groundspeed from as low as 120 knots to as high as 190 knots occurred. There were no corresponding variations in heading or altitude.

Radar data indicated that the airplane had descended from FL220 to 15,200 feet MSL and was about 30 nautical miles (nm) east of the Taos VOR when the pilot reported "light rime icing" at 1338 MST. Three minutes later, at 1341, the pilot reported "experiencing freezing rain" and, at 1343, requested a lower altitude. The controller cleared the airplane to descend to 15,000 feet and advised the pilot to "expect lower about 6 or 7 miles east of the Taos VOR." At 1348, when the airplane was about 7 nm east of the Taos VOR, the controller issued instructions to "cross the Taos VOR at or above one two thousand cleared v o r d m e alpha approach into Taos." Radar contact was lost due to terrain at 1350, and the airplane was "cleared to advisory frequency."

When the IFR flight plan was not closed, a search for the airplane was initiated. A witness reported seeing "a large puff of smoke," and this allowed the search area to be narrowed. The airplane was located about 2330, approximately 7 nm southeast of the VOR and 1 nm right of the inbound approach course as depicted on the attached VOR DME-B approach plate.

PERSONNEL INFORMATION

The pilot purchased the airplane in November 1992, and from November 11 to November 14, 1992, attended a Cessna 421 initial pilot training program consisting of 17 hours ground instruction and 10 hours flight instruction in the airplane. According to the course instructor, during the program, the pilot was given a copy of the manufacturer's publication entitled Pilot Safety and Warning Supplements, and the section called "Flight Into Icing" (copy enclosed) was discussed. This section contains the statement that the airplane's known icing package

"will not provide total protection under severe conditions such as those that exist in areas of freezing rain."

A review of the pilot's personal logbook revealed that he had made numerous flights into the Taos Municipal Airport in the accident airplane under both visual and instrument meteorological conditions. On March 16, 1993, the pilot noted that he encountered light rime ice at 18,000 feet on a flight from Oklahoma to Taos.

AIRCRAFT INFORMATION

A review of the maintenance records revealed no pre-existing discrepancies or defects which could have affected the airworthiness of the airplane. The airplane was equipped with an IMC compatible avionics package which included an autopilot with a flight director system. When the airplane was manufactured, equipment required for flight into known icing conditions was installed. At the last annual inspection, on October 26, 1994, the pneumatic regulator filters were replaced and the de-ice boots were functionally checked. Estimates indicated that the airplane was within the prescribed limits for weight and center of gravity, both at takeoff and at the time of the accident.

METEOROLOGICAL INFORMATION

An NTSB Meteorological Factual Report is attached to this report.

Geostationary Operational Environmental Satellite (GEOS) images show that cloud cover began about 6 nm east of the location where the pilot reported "light rime icing" and extended westward over the accident site. The freezing level was estimated to be 10,700 feet based on the upper air data for Albuquerque, New Mexico. This data also indicated possible cloud bases at about 10,000 feet and cloud tops at about 16,500 feet. Doppler weather radar images show radar echoes of 5 to 10 dBZ intensity at the locations where the pilot reported "light rime icing" and "freezing rain."

The following Pilot Weather Report of severe turbulence occurred in the area east of the accident site.

30 nautical miles west of LVS / time 1253 MST / Flight Level 12,000 feet / Beech 36 / skies 12,500 scattered to broken / occasional light to moderate chop / CIM to RTN severe turbulence unable to maintain altitude. LVS .. Las Vegas, New Mexico CIM .. Cimarron, New Mexico RTN .. Raton, New Mexico CIM is located on the eastern slope of the Sangre de Cristo mountain range, 44 nautical miles east of the accident site.

COMMUNICATIONS

Copies of the transcribed communications between the pilot and the air traffic control personnel at the McAlester Automated Flight Service Station and the Albuquerque Air Route Traffic Control Center are attached to this report. There was no report of any transmissions from the airplane being heard on the Taos Unicom frequency.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located approximately latitude 36 degrees 31 minutes 37 seconds north and longitude 105 degrees 48 minutes 1 second west at an elevation of 7,620 feet. Total wreckage distribution, including tree and ground scars, encompassed a linear rectangular area of 350 feet long and 300 feet wide on a center line heading of 060 degrees magnetic. The terrain along the wreckage path was heavily wooded, uneven, and partially covered with snow. There

was evidence of fuel damage to the foliage surrounding the accident site.

The first evidence of ground impact was a linear ground scar about 50 feet long and oriented at a 60 degree angle to the main wreckage path. The scar consisted of a central circular crater flanked by two smaller circular craters with a narrow indentation extending laterally from each of the smaller craters. Fragments of the instrument panel were found in the central crater. The angle between the horizontal and a surface formed by the ends of cut branches on three trees adjacent to this scar was measured at 80 degrees.

All of the structural components of the airplane, control surfaces, and both engines were identified along the wreckage path. The main wreckage was located 80 feet from the principle point of impact and consisted of the empennage. The wings, horizontal stabilizer, ailerons, elevators, and sections of the fuselage displayed longitudinal crushing. Due to the extent of the impact damage, it was not possible to determine control continuity.

One main landing gear trunnion was found with the actuator attached and exhibited a gear up configuration. The nose gear strut was driven through the nose wheel tire. Examination of the flap actuation system revealed that the flap chains were in a position which equated to partial flaps; however, it was noted that the control cables were severed and the chains may have moved during the impact sequence. The cockpit instruments and gauges were destroyed. Several minor postimpact fires consumed portions of the seat cushions.

Both engines were examined and no evidence of pre-impact mechanical failure was found. All six propeller blades separated from the hubs and displayed evidence of rotational scoring on the blade surfaces. Both turbocharger housings displayed evidence of rotational scoring.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was performed by Marcus Nashelsky, M.D., and Kurt Nolte, M.D., of the State of New Mexico Office of the Medical Investigator in Albuquerque, New Mexico. Toxicological findings were negative for drugs and alcohol. Carbon monoxide analysis could not be performed on the specimens provided.

TESTS AND RESEARCH

Three out of the four actuators and the mode selector were the only autopilot components to survive the impact in a condition permitting positive identification. These units were examined at Sigma-Tek Instruments and Avionics in Augusta, Kansas, on July 16, 1995. Extensive crush damage to the mode selector precluded bench testing it. The three actuators were disassembled to the extent necessary to examine the relays. The relays in two of the units were found in the open position, and the relay in the third unit was damaged. According to Sigma-Tek, the relays are closed when the autopilot is engaged; however, it should be noted that the relays automatically open when power is removed. Sigma-Tek also reported that the autopilot has a pitch limit disconnect circuit which automatically disengages the autopilot when pitch up exceeds 20 degrees or pitch down exceeds 18 degrees.

ADDITIONAL INFORMATION

The wreckage was released to a representative of the owner.

Pilot Information

Certificate:	Commercial	**Age:**	53, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	10/04/1994
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	809 hours (Total, all aircraft), 195 hours (Total, this make and model), 700 hours (Pilot In Command, all aircraft), 21 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	**Registration:**	N421BL
Model/Series:	421C 421C	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	421C0605
Landing Gear Type:	Retractable - Tricycle	**Seats:**	8
Date/Type of Last Inspection:	10/26/1994, Annual	**Certified Max Gross Wt.:**	6800 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	CONTINENTAL
ELT:	Installed	**Engine Model/Series:**	GTSIO-520-L
Registered Owner:	BROWN, BENNY	**Rated Power:**	375 hp
Operator:	BROWN, BENNY	**Operating Certificate(s) Held:**	None
Operator Does Business As:	BROWN'S AIRCRAFT SALES	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	SKX, 7091 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	1356 MST	**Direction from Accident Site:**	116°
Lowest Cloud Condition:	Thin Broken / 2000 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	Overcast / 2700 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	9 knots / 16 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	220°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	6°C / 1°C
Precipitation and Obscuration:			
Departure Point:	OKLAHOMA CITY, OK (OKC)	**Type of Flight Plan Filed:**	IFR
Destination:	(SKX)	**Type of Clearance:**	IFR
Departure Time:	1207 CST	**Type of Airspace:**	Class E

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:**	

Administrative Information

Investigator In Charge (IIC):	GEORGIA R SNYDER	**Report Date:**	11/08/1995
Additional Participating Persons:	MARION E TILTON; ALBUQUERQUE, NM		
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.ntsb.gov/pubdms/.		