National Transportation Safety Board
Aviation Accident Final Report

Location:	Carson, WA	**Accident Number:**	SEA06FA147
Date & Time:	01/25/2006, 1344 PST	**Registration:**	N69KM
Aircraft:	Cessna 421C	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

During a cross country flight, the pilot was informed by air traffic control that adverse weather was along his route of flight for terrain obscurement in clouds, precipitation, fog or mist. Turbulence was reported below 12,000 feet and occasional moderate rime or mixed icing was reported from the freezing level to 14,000 feet. Further along the route, the pilot reported to another controller that he was at 13,000 feet and descending. The controller inquired if the pilot was aware of the center weather advisory and the reports of severe rime ice in the direction that he was heading. The pilot acknowledged the controller by reporting that he was aware of the weather and that the aircraft was "equipped." The controller continued to inform the pilot of pilot reports from commercial aircraft flight crews of the reports of icing conditions, however, the pilot continued on his routing and again reported that the aircraft was "equipped." During the last transmissions from the pilot, he reported that he was "turning on (de-ice) equipment now." The controller recommended to the pilot to stay clear of the clouds. The pilot responded, "roger." The controller then asked the pilot if he was "going to orbit there for awhile." The pilot responded, "yes," followed by a partially unintelligible transmission of "getting some weather here." The pilot's last transmissions were "Ah, I'm in a little trouble," followed by "Ah, standby 9KM." Radar tracking indicated that the aircraft had been cruising at 16,500 feet before starting a gradual descent. The aircraft descended to 12,700 feet and it began a turn to the right. During this turn, the aircraft's altitude changed rapidly beginning with an increase, followed by a rapid loss of altitude from 8,000 feet per minute descent to 10,600 feet per minute descent before radar contact was lost. The aircraft was found 6 months later in an area of mountainous terrain. On site evidence indicated that the aircraft collided with trees and terrain in a nose low attitude with the majority of the wreckage contained in a large deep crater.

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 aircraft control while maneuvering. Icing conditions, clouds and the pilot's continued flight into known adverse weather were factors.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: MANEUVERING

Findings
1. (F) WEATHER CONDITION - ICING CONDITIONS
2. (F) FLIGHT INTO KNOWN ADVERSE WEATHER - CONTINUED - PILOT IN COMMAND
3. (F) WEATHER CONDITION - CLOUDS

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

Findings
4. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND

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

Findings
5. TERRAIN CONDITION - MOUNTAINOUS/HILLY

Factual Information

HISTORY OF FLIGHT

On January 25, 2006, at 1344 Pacific standard time, a Cessna 421C, N69KM, registered to Sugar Financial Inc., and operated by the pilot as a 14 CFR Part 91 personal flight, was reported missing when radar contact and communications were lost over mountainous terrain about 15 nautical miles northeast of Carson, Washington. Visual and isolated instrument meteorological conditions prevailed in the area where the aircraft dropped from radar contact. A search was initiated, however, due to adverse weather conditions and rugged terrain, the wreckage was not located and the search was suspended on January 27, 2006. The pilot was presumed fatally injured. No flight plan had been filed, however, the pilot was utilizing flight following services. The flight departed from Scottsdale, Arizona, approximately 1030 mountain standard time, with a final destination to Tacoma, Washington. No emergency locator transmitter signal was detected.

On July 27, 2006, the wreckage was located by two U.S. Forest Service personnel in an area of mountainous terrain about one-half mile south of the last radar target at North 45 degrees 52.154 minutes latitude and West 122 degrees 2.465 minutes longitude. Impact damage and a post-crash fire destroyed the aircraft. The pilot was fatally injured.

PERSONNEL INFORMATION

Federal Aviation Administration airmen records indicated that the pilot was issued a private pilot certificate for airplane single engine land on July 19, 2005. At this time, the pilot indicated a total flight time of 134 hours, with 12.5 hours as pilot-in-command.

On December 21, 2005, the pilot was issued the airplane multi-engine land rating for private pilot privileges. At this time, the pilot indicated a total flight time of 350 hours, with 130 hours as pilot-in-command. The rating was attained in a Cessna 310, with a reported 12 hours total time in this aircraft.

At the time of the accident, the pilot held a second-class medical certificate, dated June 8, 2005. No waivers or limitations were identified.

The flight instructor/Designated Examiner, who signed the pilot off for the private pilot certificate in both the single and multi-engine aircraft, stated that the pilot had been working on his instrument rating since October 2005. He believed that the pilot had accumulated about 200 hours in the Cessna 421. The day before the accident, he spoke with the pilot. The pilot reported that he just accumulated 400 hours total flight time. The Examiner stated that he had flown with the pilot on several occasions, and that he had flown in the Cessna 421C with the pilot from Scottsdale to Tacoma on one of those flights.

The pilot's flight logbook was not located.

AIRCRAFT INFORMATION

Aircraft records indicated that the aircraft was manufactured in 1977. The aircraft held a standard class, normal category airworthiness certificate. The aircraft was equipped with two Teledyne Continental Motors GTSIO-520-L engines. The aircraft was also equipped with a deice boot system attached to the leading edges of the wings and stabilizers.

Federal Aviation Administration Aircraft Registration records indicated that the aircraft was

registered to Sugar Financial, Scottsdale, Arizona, on October 17, 2005.

Maintenance records indicated that the aircraft was signed off for the completion of the Cessna Progressive Operation #4 Inspection on August 19, 2005. At the time of the inspection the aircraft had accumulated a total airframe time of 5,206 hours.

On November 29, 2005, Scottsdale Flyers, LLC, signed the aircraft off for the Cessna Progressive Operation #1 Inspection. At the time of the inspection, the aircraft had accumulated a total airframe time of 5,264.1 hours. On December 15, 2005, the logbook entry indicated that the aircraft was removed from the Cessna Progressive Care Inspections program. At this time the airframe total time was listed as 5,306.5 hours. The next annual inspection was due August 2006.

The last entry in the maintenance logbook was dated January 23, 2006, for the completion of a visual inspection of the exhaust system in compliance with AD 00-01-16. At this time the airframe total time was listed as 5,358.8 hours.

The engine logbooks indicated that the left engine, model GTSIO-520-L3B, s/n: 292435-R, was rebuilt/zero timed on March 31, 2000, by Teledyne Continental Motors, and installed on N69KM on April 24, 2000. The last entry in the logbook dated January 23, 2006, indicated that the engine total time since major overhaul was 1,541.8 hours. During this maintenance visit, the oil and filter were changed and the engine was serviced with 12 quarts of oil. The engine was run and a leak check was accomplished.

The right engine, model GTSIO-520-L, s/n: R-245870.R, was overhauled by RAM Aircraft on June 13, 2001, and installed on N69KM June 15, 2001. The last entry in the logbook dated January 23, 2006, indicated that the engine total time was 7,907.2 hours, with 1,207.7 hours since major overhaul.

Prior to departing from Scottsdale, the aircraft was fueled. The person who fueled the aircraft was employed with Corporate Jets. The fueler stated that he was familiar with this aircraft and had seen this pilot before, however, he stated that this was the first time that the pilot was not with another person. The fueler stated that he topped off both wing main tanks and finished with the left side wing locker tank. A total of 152.2 gallons of 100LL fuel was added. During the brief conversation the fueler had with the pilot, he did not notice anything out of the ordinary with the pilot's behavior. The fueler stated that the pilot did a pre-flight check of the aircraft. Once the fueling was complete, the fueler stated that the engines were started and the pilot taxied the aircraft out to the runway and took off. The fueler did not provide any other services to the aircraft and noted nothing out of the ordinary with the operation of the aircraft or engines.

The Cessna 421C Airplane & Systems Description section from the Pilot's Operating Handbook of the fuel system indicated that the left and right main tanks in the wings each held 103 gallons. The optional wing locker fuel tank held 28 gallons.

METEOROLOGICAL INFORMATION

Weather information provided by the Federal Aviation Administration indicated that the weather in the area about 35 miles south of the accident site reported moderate to occasional severe rime/mixed icing conditions in precipitation between 8,000 feet to 12,000 feet. The area of icing covered from 55 miles east of Seattle International Airport (SEA), to 70 miles south, to 40 miles west and was valid from 1324 to 1430 local time. Tacoma Narrows Airport

was within this area of coverage to the southwest (15 nautical miles) of SEA.

Flight crews from commercial aircraft in the area issued pilot reports (PIREPs) to air traffic control. At 1228 local time a DeHavilland Dash-8 flight crew reported their location of 360 degrees from Battle Ground VOR at 40 miles, the flight encountered severe mixed icing from 13,000 feet descending to 11,000 feet. At 1246, another commercial flight crew reported at 340 degrees from Battle Ground VOR at 10 miles, the flight encountered moderate mixed icing climbing from 10,000 feet to 13,000 feet.

The Portland International Airport (PDX) aviation routine weather report (METAR) reported at 1255, a temperature of 07 degrees C., dew point of 06 degrees C., and wind from 170 degrees at 6 knots. The visibility was 5 statute miles, with an altimeter setting of 29.91" Hg. The clouds were broken at 600 feet and 2,500 feet, and overcast at 4,000 feet, with light rain and mist.

At 1343 a Special METAR for PDX indicated a temperature of 07 degrees C., a dew point of 06 degrees C., and wind from 170 degrees at 7 knots. The visibility was 6 statute miles, with an altimeter setting of 29.92" Hg. The clouds were scattered at 600 feet, broken at 2,900 feet and overcast at 3,700 feet, with light rain and mist.

AIRMETs Tango and Zulu were effective January 25, 2006, from 1245 to 1900 local for turbulence and icing conditions for Washington, Oregon, California and coastal waters. AIRMET Zulu reported occasional moderate rime/mixed icing conditions in precipitation between the freezing level and 14,000 feet. The freezing level was from 4,000 feet to 5,000 feet. AIRMET Tango reported occasional moderate turbulence below 12,000 feet due to strong low-level winds.

COMMUNICATIONS

At 1304, while in flight, the pilot contacted McMinnville Automated Flight Service Station (AFSS) and reported that he was 45 miles southwest of Redmond, Oregon, at 16,500 feet with a final destination to Tacoma, Washington, and requested weather along his route of flight.

The specialist reported that AIRMETS were in effect along the route for terrain obscurement in clouds, precipitation, fog or mist. Occasional moderate turbulence was reported below 12,000 feet. Occasional moderate rime or mixed icing was reported from the freezing level to 14,000 feet. The freezing level was from 3,000 feet to 5,000 feet. Instrument flight rule (IFR) conditions were forecast throughout Western Washington. East of the Cascades was "in good shape." The west side had few to scattered clouds from 700 feet to 1,000 feet. At 2,000 feet to 4,000 feet the clouds were broken, with variable overcast. Tacoma Narrows had a wind reported from 180 degrees at 9 knots, with a visibility of 4 miles with light rain and mist. The cloud conditions were scattered at 3,000 feet, a ceiling was broken at 3,800 feet and overcast at 4,900 feet. The temperature was 7 degrees C, with a dew point of 5 degrees C. The altimeter was 29.83" Hg. The Redmond altimeter was 29.82" Hg. The specialist reported that visual flight rules (VFR) flight was not recommended from the Cascades, westward due to terrain obscurement.

The pilot thanked the specialist for the help, and the conversation was concluded at 1307, with the specialist reporting to the pilot for additional weather he could contact flight watch on 122.0.

The NTSB Investigator-In-Charge requested from the Federal Aviation Administration a copy of the air traffic communications from 1335 local to 1426 local. The communications began

with conversations between Seattle Air Route Traffic Control Center, R32 position, and several commercial aircraft within the sector before the pilot of N69KM made contact about 1345. The conversations began with the R32 controller reporting the icing conditions to the flight crews, and the flight crews responding with what actual icing conditions they were experiencing and at what flight altitudes.

The pilot of N69KM initially made contact with the R32 controller reporting that he was 13,000 feet and descending. The controller acknowledged the pilot and inquired if he was aware of the center weather advisory and the reports of severe rime ice in the direction that he was heading. The pilot acknowledged the controller by reporting that he was aware of the weather and that the aircraft was "equipped." The pilot also stated that he would get a deviation to the east "in a little bit." The pilot then asked for a report (weather) to the east.

The controller informed the pilot of the reports from flight crew in commercial aircraft, of the severe mixed icing conditions and numerous reports of moderate rime icing conditions. The pilot responded that he would deviate to the east and try a different field. The controller then asked the pilot if he was changing his destination. The pilot responded that he would come into Tacoma Narrows from the east if there were no reports coming in from the east. The controller responded that the weather would be moving to the east, the report he had of the severe rime icing was probably over a half hour old and that weather was moving to the northeast. The controller thought that maybe "to the west would be better or not."

The pilot again responded that he was "equipped." The remainder of the pilot's transmission was unintelligible, however, it was believed that he meant that the aircraft was equipped with de-icing equipment. The following transmission from the pilot was partially unintelligible, however he indicated that he was "turning on (the de-ice) equipment now." The controller recommended to the pilot to stay clear of the clouds. The pilot responded, "roger." The controller then asked the pilot if he was "going to orbit there for awhile." The pilot responded, "yes," followed by a partially unintelligible transmission of "getting some weather here."

After a short time, the controller asked the pilot what his intentions were and the pilot responded, "Ah, I'm in a little trouble." The controller responded, "are you in trouble now." The pilot responded, "Ah, standby 9KM." No further transmissions were received from N69KM after this time.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located in an area of mountainous terrain at 45 degrees 52.154 minutes north latitude, 122 degrees 02.465 minutes west longitude at an elevation of approximately 2,591 feet mean sea level. The area was covered with 100 foot plus tall deciduous trees and thick ground cover in the immediate area of the accident site. The debris path was over relatively flat terrain, with rising terrain to the east. Evidence of impact with tree tops was noted with wreckage found at the bases of these trees. The wreckage distribution path traveled on about a 320 degree magnetic heading. From the first evidence of tree impact to the furthest piece of wreckage (left side propeller blade), the total distribution path of wreckage was about 297 feet. At the beginning of the path, pieces of the right side winglet were located at the base of about 100 foot tall trees. The tree tops were broken off. Several trees were damaged for about 144 feet into the path before the first evidence of ground impact was noted. A large crater measuring about 40 feet in length and at least five feet deep contained the remains of the majority of the aircraft fuselage. Evidence of a post crash fire was noted.

Within the crater, remains of the rudder, main landing gear tires, sections of the cabin and sections of the elevators were noted. Both engines were buried within this crater and deep enough that only the accessory section of one of the engines was visible. Four of the six propeller blades were either in or close proximity to the crater. The remaining two propeller blades were not located. The blades that were located were numbered by the investigative team and the part numbers were later matched to identify blade numbers 1, 3, and 4 as the blades for the left side engine. Blade #3 was the most severely damaged with blade tip curling and bending. The other blades displayed aft bending and chordwise scratching.

Flight control continuity was not possible, however, the investigative team was able to locate and identify both wing tips and empennage control surfaces.

MEDICAL AND PATHOLOGICAL INFORMATION

Skamania County Sheriff's Office personnel conducted a search for remains. A small amount of bone fragments were located. During the search a blue colored rubber urine bag was located that was intact and contained urine. The urine sample was sent to the Federal Aviation Administration Civil Aeromedical Institute, Oklahoma City, Oklahoma, however the specimen was unsuitable for analysis.

ADDITIONAL DATA/INFORMATION

Radar data tracking began at 1309 and indicated that the aircraft had been cruising at approximately 16,500 feet heading northwesterly. At 1335, the tracking began a gradual descent. At 1343 the aircraft had descended to 12,700 feet and began a turn to the right. During this turn, the aircraft's altitude changed rapidly beginning with an increase, followed by a rapid loss of altitude from 8,000 feet per minute descent to 10,600 feet per minute descent. The last target recorded was at 1344, at an altitude of 7,400 feet, at coordinates 45 degrees, 52 minutes, 46.800 seconds north latitude, 122 degrees, 02 minutes, 13.732 seconds west longitude.

The wreckage was not recovered from the accident site.

Pilot Information

Certificate:	Private	**Age:**	42, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2	**Last FAA Medical Exam:**	06/01/2005
Occupational Pilot:		**Last Flight Review or Equivalent:**	12/01/2005
Flight Time:	400 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N69KM
Model/Series:	421C	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	421C0440
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:	11/01/2005, Annual	**Certified Max Gross Wt.:**	7500 lbs
Time Since Last Inspection:	95 Hours	**Engines:**	2 Reciprocating
Airframe Total Time:	5363 Hours at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	GTSIO-520-L
Registered Owner:	Sugar Financial	**Rated Power:**	375 hp
Operator:	Martin A Ayres	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	PDX, 30 ft msl	**Distance from Accident Site:**	29 Nautical Miles
Observation Time:	1355 PST	**Direction from Accident Site:**	218°
Lowest Cloud Condition:	Few / 600 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	Overcast / 3400 ft agl	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	160°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.9 inches Hg	**Temperature/Dew Point:**	7°C / 5°C
Precipitation and Obscuration:			
Departure Point:	Scottsdale, AZ (SDL)	**Type of Flight Plan Filed:**	None
Destination:	Tacoma, WA (TIW)	**Type of Clearance:**	None
Departure Time:	1030 MST	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	45.870833, -122.046111

Administrative Information

Investigator In Charge (IIC):	Debra J Eckrote	**Report Date:**	01/31/2007
Additional Participating Persons:	Ernie Keener; FAA/FSDO; Hillsboro, OR Seth D Butner; Cessna Aircraft Company; Wichita, KS Andrew Swick; Teledyne Continental Motors; Mobile, AL		
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/.		

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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.