Aviation Investigation Final Report

Location:	PENA POBRE, Puerto Rico	**Accident Number:**	MIA01FA140
Date & Time:	May 13, 2001, 19:33 Local	**Registration:**	N404BA
Aircraft:	Cessna 404	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

The flight was being handled as a VFR aircraft by air traffic control, was given a discreet transponder code, and was radar contact at an altitude of 4,500 feet. The pilot requested a VFR decent from 4,500 feet, and was cleared to "...descend unrestricted west bound." Radar and radio contact were lost at an altitude of 2,700 feet. The controller tried to re-establish radio contact with the airplane's pilot 10 times before initiating search and rescue efforts. A U.S. Coast Guard helicopter found the wreckage, using the aircraft's emergency locator transmitter. The next day a ground search for the aircraft was halted because of hazardous terrain. Search and rescue personnel had to be air lifted into the crash site to remove the victim. A police helicopter was vectored to the crash site by ATC about an 1 1/2 hours after contact was lost with the flight, and the pilot reported that he could not fly near the crash site because of fog. He reported the ceiling about 2,400 feet. The aircraft impacted in heavily wooded, mountainous terrain at the 2,700-foot level of a 3,524-foot mountain. Toxicology test showed that venlafaxine and desmethylvenlafaxine drugs were found in the pilot's blood, and the levels found were consistent with the recent ingestion of more than 10 times a normal dose of venlafaxine.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: failure of the pilot-in-command to maintain altitude/clearance, resulting in an in-flight collision with rising terrain.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - NORMAL

Findings
1. LIGHT CONDITION - DARK NIGHT
2. WEATHER CONDITION - FOG
3. TERRAIN CONDITION - RISING
4. (C) ALTITUDE/CLEARANCE - NOT OBTAINED/MAINTAINED - PILOT IN COMMAND
5. USE OF INAPPROPRIATE MEDICATION/DRUG - PILOT IN COMMAND

Factual Information

HISTORY 0F Flight

On May 13, 2001, about 1933 Atlantic daylight time, a Cessna 404, N404BA, registered to Air Cargo Systems International Inc., and operated by City Wings Inc., as a Title 14 CFR Part 91 positioning flight, impacted with rising terrain, at night, in the Caribbean National Forest, near Pena Pobre, Puerto Rico (PR). Visual meteorological conditions prevailed. No flight plan was filed. The airplane was destroyed. The commercial rated-pilot was fatally injured. The flight had departed from St. Croix, U.S. Virgin Islands at 1900.

The flight was en route to Aguadilla, PR (TJBQ), with a stopover at Luis Munoz Marin International Airport, San Juan, PR (SJU). According to the air traffic control tapes, the pilot was in radio contact with San Juan approach control and was being handled as a VFR aircraft. The pilot was given a discreet transponder code of 0411, and was in radar contact at about 1910, 12 miles west of St. Croix, at an altitude of 4,500 feet. The pilot requested a VFR descent from 4,500 feet. The controller coordinated with Roosevelt Roads Naval Station, the sector that the flight was in, and subsequently cleared the flight at 1923:59, to "…descend unrestricted west bound." The flight appeared to follow the 160 degree radial, inbound to the San Juan VORTAC (Very High Frequency Omni-Directional Radio Range Tactical Air Navigation Aid). According to ATC controllers at SJU approach control, the minimum-vectoring altitude for all aircraft flying in the same area as N404BA, on instrument flight rule (IFR) flight plans was 6,000 feet.

At 1924:10, radar showed that the flight started to descend out of 4,500 feet, and at 1928:33, had stopped its descent at 2,700 feet. Radio and radar contact were lost at 1930:26, and the last radar hit on the flight showed it at an altitude of 2,700 feet. The controller tried to re-establish radio contact with the airplane's pilot 10 times before initiating search and rescue efforts. About 2020, a U.S. Coast Guard helicopter located the wreckage, with the aid of the aircraft's emergency locator transmitter, and rescue workers got within 2 to 3 nautical miles of the wreckage, but due to night darkness, and the steep-rugged terrain elected to wait until day light before continuing the search and rescue operations, postponing their efforts for several hours. The next day a ground search for the aircraft was halted because of hazardous terrain, and the air rescue continued. Search and rescue personnel were air lifted into the crash site to remove the victim.

PERSONNEL INFORMATION

The pilot, held an FAA commercial pilot certificate, with airplane single and multi-engine land, airplane instrument, last issued on June 6, 1998. The pilot held an FAA class 2 medical certificate issued on August 24, 2000, with no limitations. The pilot received a biennial flight

review, as required by 14 CFR Part 61, on August 6, 1999. As per the entries in his company flight records, he had accumulated a total of 550 total flight hours, 166 total single engine flight hours, and 384 hours muti-engine aircraft when he was hired by City Wing Inc; on May 24, 2000. In addition, the records showed that he had a total of 80 night flight hours, 50 simulated instrument flight hours, and 20 actual instrument flight hours. In the last 90 days before the accident the pilot flew a total 90 hours all in this make and model aircraft. In the last 30 days before the accident the pilot flew a total of 67 hours all in this make and model aircraft. According to the company flight records the pilot had not logged any instrument flight hours in the three months before the accident. In addition, the company records showed that the pilot had logged 6.5 of night flight hours in the 90 days before the accident. As of the pilot's last flight physical on August 24, 2000, at the time of the accident, the pilot had logged a total of about 1,000 flight hours in all aircraft.

AIRCRAFT INFORMATION

The airplane was a Cessna, model 404, serial number 404-0237, manufactured in 1978. At the time of the last annual the airplane had accumulated 11,953.1 total flight hours. The airplane received an annual inspection on April 29, 2001, 50 hours before the accident. The airplane was equipped with two Continental Motors GTSIO-520-M, 375 horsepower engines. According to the engine logbooks, the left engine was put in service March 4, 1997, and the right engine was put in service on November 11, 2000. At the time of the accident it was estimated that the left engine had a total time of 1,363.1 hours since major overhaul (SMOH) and the right engine had 165.7 hours SMOH (See the copies of the engine and airframe logbooks, an attachment to this report).

METEOROLOGICAL INFORMATION

The reported weather at Roosevelt Roads Naval Air Station (JNR) at 1955, about 12 miles east of the crash site was; 2,500 feet broken, 25,000 feet overcast, visibility 10 sm, winds 140 degrees at 6 knots, temperature 79 degrees F, dew point 75 degrees F, and the altimeter was 30.00 inches Hg.

The reported weather at San Juan at 1954, 30 miles northeast of the crash site was; clear, visibility 10 sm, winds 160 degrees at 5 knots, temperature 82 degrees F, dew point 75 degrees F, and the altimeter was 29.99 inches Hg.

A police helicopter was vectored to the area of the crash site by ATC at 2045, and the pilot reported that he could not fly near the crash site because of fog. He reported the ceiling about 2,400 feet.

The San Juan weather was VMC. However, according too FAA personnel from the area, it is common for rain clouds to move in and out of the Caribbean Forrest, and mountain regions in the area of the crash site, and not always picked up on automated surface observation (ASOS) weather.

WRECKAGE AND IMPACT INFORMATION

The aircraft impacted in heavily wooded, mountainous terrain about 30 miles southeast of San Juan, Puerto Rico, on the property of the Caribbean National Forest. The wreckage was located at the 2,700-foot level of a 3,524-foot mountain. The accident occurred during the hours of darkness about 18 degrees, 15 minutes north, and 065 degrees, 49 minutes west.

Due to the terrain difficulty, and the National Park Service restrictions, access to the wreckage by foot or road was impossible. Rescue personnel had to be lowered into the crash site by helicopter and with their assistance only the two engines were removed from the crash site. The airframe could only be viewed overhead from a helicopter. The airplane appeared to have impacted the trees on a heading of 340 degrees, and parts of the airplane separated as the airplane impacted trees. It was noted that the fuselage, wings and tail had sustained post-impact fire damage. Both engines had separated from the airframe, and both propellers had separated from their respective engines.

The fuel system was not recovered, and was not observed. Company records had indicated that 200 gallons of fuel had been added to the airplane's fuel tanks before departure from Saint Croix.

After removal of the engines from the crash site they were examined at the facilities of the Puerto Rico State Police, San Juan, Puerto Rico, in the presence of the NTSB IIC, the FAA, representatives of Continental Motors, and Cessna Aircraft, on May 17, 2001.

The initial inspection of the left engine revealed the following damage: The number 6 cylinder valves were found broken out of the cylinder head; the propeller was broken off at the hub; the propeller governor was broken off and missing; the magnetos were broken off the engine; the number 5 intake pipe was broken off; the starter was broken off and missing; the alternator was broken; and the hydraulic pump was broken off and missing. The oil pan was found crushed. Most of the exhaust system was missing.

Examination of the left engine revealed the presences of fuel in the fuel manifold, and the fuel pump. The fuel pump drive was found undamaged, in place, and the pump rotated freely. The fuel screen was found clean. The crankshaft was free to partially move, but could not be rotated 360 degrees. Continuity was observed through the gear train. Further examination was made to determine what caused the restriction in the crankshaft rotation. It was determined that the left side of the crankcase had shifted rearward from impact forces, and the camshaft was binding in the forward camshaft bearing. The oil pump gears and housing were free from pitting or scouring. There was a presence of oil in the pump. Both magnetos rotated freely by hand and produced spark. Observations of the spark plugs revealed normal wear and combustion color. Observations of the pistons revealed normal color and deposits. No broken rings were observed. The vacuum pump displayed impact damage, the pump would not rotate, the unit was disassembled, and all the vanes were found broken.

Examination of the left engine did not reveal any discrepancies.

The initial inspection of the right engine revealed the following damage: The number 4 cylinder valves were found broken out of the cylinder head; the number 6 cylinder head was broken off and missing; the propeller was broken off at the hub; the propeller governor was broken off and missing; the magnetos were broken off the engine; the number 5 intake tube was broken off; the number 5 intake rocker assembly was found broken off; the alternator was broken; the starter was broken off. The propeller governor was broken off and missing. The oil pan was found crushed. Most of the exhaust system was broken off and missing. The right side of the engine was exposed to the fire. The vacuum pump was broken off and missing.

Examination of the right engine revealed the fuel pump drive was found undamaged, in place, and the pump rotated freely, the pump had been subjected to heat damage. The fuel screen was found clean. The crankshaft was free to partially move, but could not be rotated 360 degrees due to impact damage. Continuity was observed through the gear train. The oil pump gears and housing were free from pitting or scouring. There was a presence of oil in the pump. Both magnetos rotated freely by hand and produced spark. Observations of the spark plug revealed normal wear and combustion color. Observations of the pistons revealed normal color and deposits. No broken rings were observed. Examination of the right engine did not reveal any discrepancies.

MEDICAL AND PATHOLOGICAL INFORMATION

Dr. Janet J. Rivera performed an autopsy on the pilot, at the Medical Examiner's Office, San Juan, Puerto Rico, on May 15, 2001. According to the autopsy report the cause of death was "…Severe trauma to the body..." No findings, which could be considered causal to the accident, were reported.

Toxicological tests were conducted at the Federal Aviation Administration, Research Laboratory, Oklahoma City, Oklahoma, and revealed, "No ethanol detected in Blood." Drugs were found in the urine and blood, to include; Venlafaxine and Desmethylvenlafaxine (See the Federal Aviation Administration's Toxicology Report, an attachment to this report).

The National Transportation Safety Board's, Medical Officer reviewed the FAA-CAMI toxicology report and gave the following information about the drugs that were found in the study.

Venlafaxine is a prescription antidepressant also known by the trade name Effexor, used for a variety of additional purposes including the treatment of certain painful muscle conditions. Desmethylvenlafaxine is a metabolite of venlafaxine. The levels of venlafaxine and desmethylvenlafaxine that were found in the pilot's blood were consistent with the recent ingestion of more than 10 times a normal dose of venlafaxine. Recent controlled studies of venlafaxine in healthy volunteers have shown no significant impairment of cognitive or psychomotor performance. However, the second of those studies indicated a reduction in vigilance, particularly in the first week of beginning the medication, prompting the authors to

conclude that drugs in this class may reduce arousal in particularly monotonous tasks or environments. Overdose has been reported to cause dizziness, abnormal heart rhythms, and loss of consciousness, but deaths due to overdose of venlafaxine alone are rare. (NOTE: the two sources of the studies were; Nathan, P.J.; Sitaram, G.; Stough, C.; and others. 2000. "Serotonin, noradrenaline and cognitive function: a preliminary investigation of the acute pharmacodynamic effects of a serotonin versus a serotonin and noradrenaline reuptake inhibitor." Behavioral Pharmacology 11(7-8):639-42; and O'Hanlon, J.F.; Robbe, H.W.; Vermeeren, A.; and others. 1998. "Venlafaxine's effects on healthy volunteers' driving, psychomotor, and vigilance performance during 15-day fixed and incremental dosing regimens." Journal of Clinical Psychopharmacology 18(3):212-21.)

The NTSB Medical Officer, from the medical records maintained on the pilot by the Federal Aviation Administration (FAA) Aerospace Medical Certification Division, extracted the following medical information:

The pilot's initial application (dated November 15, 1995) for an Airman Medical and Student Pilot Certificate noted the use of "…Wellbuton [sic] - chemical imbalance/ 3 daily." A letter from the FAA dated December 7, 1995, indicated that consideration of the pilot's application disclosed that he did not meet the medical standards due to a "medical condition requiring the use of disqualifying medication (Wellbutrin)." A letter from the pilot's psychiatrist dated November 12, 1996, noted that the pilot had been seen on "... two occasions. The first time was over a year ago. He presented [me] with symptoms, which I thought warranted a trial of antidepressant medication. I gave him a prescription, which he never filled. I recently re-examined [the pilot]. There were no signs of depression. He told me he had never taken the antidepressants I had prescribed, and his emotional complaints had cleared by themselves. I do not believe [the pilot] is in need of further psychiatric treatment." A second letter from the FAA dated November 12, 1996, indicated "Our review of your medical records has established that you are eligible for a third-class medical certificate. …" Further applications for airman medical certificate indicate "no" in response to the question "Do You Currently Use Any Medication?"

ADDITIONAL INFORMATION

The FAA operating certificate was issued to Prin Air Company Inc., doing business as City Wings INC., was issued for CFR part 135, and specified "on demand, day VFR only." The accident flight was returning to San Juan empty, after completion of a revenue flight, at night under CFR Part 91.

The airplane was released to Mr. Luis A. Irizarry President L.A. Irizarry and Associates, on behalf of the owner, on May 17, 2001.

Pilot Information

Certificate:	Commercial	**Age:**	22,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	August 24, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 6, 2000
Flight Time:	1000 hours (Total, all aircraft), 103 hours (Total, this make and model), 90 hours (Last 90 days, all aircraft), 67 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N404BA
Model/Series:	404	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	404-0237
Landing Gear Type:	Retractable - Tricycle	**Seats:**	10
Date/Type of Last Inspection:	March 29, 2001 Annual	**Certified Max Gross Wt.:**	8400 lbs
Time Since Last Inspection:	50 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	12000 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	GTSIO-520 M
Registered Owner:	Air Cargo Systems International Inc.	**Rated Power:**	375 Horsepower
Operator:	CITY WINGS INC	**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:	Prinair/City Wings	**Operator Designator Code:**	W5NA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	TJNR,38 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	19:55 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Clear	**Visibility**	3 miles
Lowest Ceiling:	Broken / 2500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	26°C / 24°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	ST CROIX (STX)	**Type of Flight Plan Filed:**	None
Destination:	San Juan, PR (SJU)	**Type of Clearance:**	VFR flight following
Departure Time:	19:00 Local	**Type of Airspace:**	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	18.221744,-66.589157(est)

Administrative Information

Investigator In Charge (IIC):	Yurman, Al
Additional Participating Persons:	Joaquin Camacho; FAA; San Juan, PR John V Bures; Continental Motors; Mobile, AL Seth Buttner; Cessna Aircraft; Wichita, KS
Original Publish Date:	May 13, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=52256