



National Transportation Safety Board Aviation Accident Final Report

Location:	Greenhead, FL	Accident Number:	MIA07FA029
Date & Time:	12/22/2006, 0849 CST	Registration:	N70BC
Aircraft:	CESSNA 421B	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	5 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

Prior to takeoff, the pilot contacted Eglin Clearance Delivery for a weather briefing. He was informed of severe thunderstorms in the area and worked out a plan with the Clearance Delivery operator to avoid them. The flight originated from Destin Florida Airport, Destin, Florida about 0832 central standard time en route to Marsh Harbor, Bahamas. Eglin South Approach Control provided vectors to steer the flight around the weather. At 0841:30, the flight was handed off to Tyndall Approach Control. The flight was informed that it was entering "a line of weather that's going to continue for the next 15 miles." At 0844:10, Tyndall Approach Control alerted all aircraft of "hazardous weather." Tyndall Approach Control also informed the flight that their station was not equipped with the same detailed weather radar that Eglin had, and instructed the flight to continue on its current vector, which was provided by Eglin. About 4 minutes later, the pilot contacted ATC to request a block altitude clearance because he was "up and down here quite a bit." The controller provided a clearance for 4,000 through 6,000 feet. The pilot acknowledged the clearance, and there were no further communications with the flight. The pilot and four passengers were fatally injured, and the aircraft was destroyed after impacting the ground near Greenhead, Florida. According to the Sheriff, the property owner who initially located the wreckage, said that there was heavy rain, thunder, lightning and wind in the area at the time of the accident. The NTSB conducted a meteorological study and weather data along with the airplane's track and found it to be consistent with the airplane encountering a level 5 thunderstorm.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot-in-command's improper planning/decision and continued flight into known adverse weather which resulted in an encounter with a level 5 thunderstorm.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER

Phase of Operation: CRUISE - NORMAL

Findings

1. WEATHER CONDITION - THUNDERSTORM
 2. (C) PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
 3. FLIGHT INTO KNOWN ADVERSE WEATHER - CONTINUED - PILOT IN COMMAND
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Occurrence #2: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: CRUISE - NORMAL

Findings

4. DESCENT - UNCONTROLLED
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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

5. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On December 22, 2006, about 0849 central standard time, a Cessna 421B Golden Eagle airplane, N70BC, registered to and operated by Island Times LLC, as a Title 14 CFR Part 91 personal flight, crashed in Greenhead, Florida. Instrument meteorological conditions prevailed, and an instrument flight rules flight plan was filed. The airline transport-rated pilot and four passengers received fatal injuries, and the airplane was destroyed. The flight originated in Destin, Florida, the same day, about 0832, and was en route to the Bahamas.

Records obtained from the FAA showed that the pilot of N70BC had contacted Eglin Clearance Delivery at 0805:35 to "talk to somebody about the weather." For about fifteen minutes, the accident pilot and Eglin Clearance Delivery discussed the location of weather systems in Northern Florida, and a route of flight that could avoid them. The weather systems mentioned in their conversation included level 6 thunderstorms, which FAA Advisory Circular AC 00-24B described as "extreme" with severe turbulence, lightning, large hail, and extensive surface wind gusts and turbulence.

At 0829:41, a controller with Eglin South Approach Control cleared the pilot of N70BC for departure on runway 32, en route to Marsh Harbor, Bahamas. The pilot was instructed to, after takeoff, "turn right heading zero niner zero maintain two thousand." And the pilot of N70BC acknowledged. At 0832:48, the pilot reported that they had taken off, and was "climbing to two thousand." South Approach Control instructed the flight to "climb and maintain five thousand." At 0833:17, South Approach Control informed the flight that "in about another three miles I'm showing ... no weather at all between you and Pensacola."

For the next seven minutes, South Approach Control proceeded to vector N70BC around "some weather that's going to be southeast of your position" and around traffic, until the flight was able to reach five thousand feet. At 0835:18, South Approach Control informed N70BC that "there's so much weather around I don't have a lot of area to vector you in." At 0840:23, South Approach Control instructed N70BC to "contact Tyndall Approach on one one niner point one and advise them of your heading." The pilot of N70BC acknowledged at 0840:31.

At 0841:30, the pilot of N70BC contacted Tyndall Approach Control, and at 0841:44, Tyndall Approach responded saying, "roger. Yeah I'm showing you just entering a line of weather that's going to continue for the next 15 miles."

N70BC was instructed to maintain the last heading given by Eglin. At 0844:10, Tyndall Approach stated, "Attention all aircraft, hazardous weather information airmets sierra, tango, and zulu for TN, WV, VA, MS, LA, AL, FL, GA, SC, NC and coastal waters available on HIWAS, Flight Watch, and Flight Service frequencies.

The pilot of N70BC contacted Tyndall Approach at 0844:52, to ask if they "still show this a good heading?" and at 0844:58, the Tyndall Approach controller responded, "fly heading 1-1-0". At 0845:07, the Tyndall Approach controller said to the pilot of N70BC "I don't have the weather radar that Eglin had. They put you up in this area based on the different levels of precipitation that they are showing. So all I show is precipitation returns. I'm showing you beginning line of a band of weather and on that 110 heading you'll be breaking out of it in about 15 miles."

N70BC acknowledged "Ok good copy Bravo Charlie." At 0848:38, N70BC requested a block clearance because he was "up and down here quite a bit."

Tyndall Approach approved a clearance for 4,000 through 6,000, and the pilot of N70BC acknowledged at 0848:46. There were no further communications with the flight.

According to the Tyndall controller, the aircraft was on the 012 degree radial at 12 miles from the Panama City VOR, at the time of the last radio communications contact.

PERSONNEL INFORMATION

The pilot held certificates for commercial pilot with single- and multi-engine land ratings, commercial helicopter with instrument rating, instrumental airplane with single- and multi-engine ratings, and certified flight instructor with single-engine, multi-engine and instrument airplane ratings, and was also a FAA Designated Pilot Examiner. The pilot held an FAA Class 2 medical certificate, issued in December, 2005.

The pilot's logbook was available to the NTSB, but a resume that had been included in copies of a flight training record indicated that the pilot had accumulated about 15,000 total flight hours, including about 8,000 hours as a FAA certificated flight instructor, about 14,500 hours as the pilot-in-command, about 8,000 hours in multi-engine aircraft, about 2,000 instrument hours, and about 900 hours with the Cessna 400 series airplane. The information also showed that the pilot possessed experience with a wide range of other aircraft, including gliders, helicopters, and military jets to include the AV-8B Harrier and the F-104 Starfighter airplanes, and that he was a graduate of USAF Experimental Test Pilot School.

AIRCRAFT INFORMATION

N70BC was a 1974 Cessna 412B, serial number 421B0813. Information obtained from the aircraft's maintenance records showed that the aircraft had received an annual inspection on November 5, 2006, at which time it had accumulated about 6,477.8 hours.

The airplane was equipped with two engines that were mounted on the respective wings. A 375-horsepower Continental GTSIO-520-HIB engine, serial number 267338-R was mounted on the left, and a 375-horsepower Continental GTSIO-520-H engine, serial number 600096 was mounted on the right. Inspections were last performed on the engines on November 5, 2006, at which time they were noted to have been in service for 1297.3 hours and 4,324.3 hours respectively.

The airplane was equipped with two full-feathering McCauley 3AF34C92 propellers, on the left propeller the serial number was 743409, and that on the right was 794955. As of November 5, 2006, the logbook information showed that the propellers had been in service for about 1,294.3 hours.

METEOROLOGICAL INFORMATION

Panama City, Florida (PFN) is located about 15 nautical miles south of the last radar location for N70BC. Instrument meteorological conditions prevailed at the time of the accident, and the 0853, Panama City Airport (PFN) surface weather observation was: wind from 190 degrees at 12 knots, visibility 5 statute miles, ceiling 600 feet overcast, temperature 22 degrees Celsius, dew point temperature 21 degrees Celsius, and the altimeter setting was 29.98 inHG.

Several SIGMETs and AIRMETS had been issued pertinent area and/or time of the flight. Convective SIGMETs and AIRMETS are issued by the Aviation Weather Center (AWC) in

Kansas City, Missouri.

Convective SIGMET (WST) 17E was issued December 22, 2006, at 1255Z, and was stated to be valid until December 22, 2006 at 1455Z, and encompassed an area of embedded thunderstorms moving from 220 degrees at 20 knots, with tops to FL400.

Convective SIGMET 18E was issued December 22, 2006, at 1255Z and valid until December 22, 2006 at 1455Z, and encompassed an area of thunderstorms moving from 220 degrees at 25 knots, with tops to FL410.

Convective SIGMET 19E had been issued December 22, 2006, at 1355Z, and was valid until December 22, 2006 at 1555Z. It encompassed an area of embedded thunderstorms moving from 220 degrees at 25 knots, and with tops to FL400.

Convective SIGMET 21E was issued on December 22, 2006, at 1455Z, and was valid until December 22, 2006, at 1655Z. It involved a line of embedded thunderstorms 15 nautical miles wide moving from 240 degrees at 20 Knots, and with tops to FL400.

AIRMET Sierra Update 1 for IFR issued December 22, 2006 at 0845Z and valid until December 22, 2006 at 1500Z. Ceiling below 1,000 feet, and visibility below 3 miles in precipitation, mist and fog.

At 1445Z, December 22, 2006, AIRMET Sierra Update 2 pertaining to instrument meteorological conditions was issued, and it was valid until December 22, 2006 at 2100Z. It warned of ceilings below 1,000 feet, visibility below 3 miles in precipitation, with mist and fog.

AIRMET Tango Update 3 for turbulence was issued on December 22, 2006 at 1445Z , and it was valid until December 22, 2006 at 2100Z. It warned of moderate turbulence below 12,000 feet.

At the time of the accident no Convective SIGMETs or Jacksonville Center Weather Advisories were issued for the area that encompassed the accident location.

A weather radar image taken from Eglin Air Force Base (EVX) at 0848:40, twenty seven seconds before the last radar contact with the accident airplane, showed that there were radar echoes in the 50-54 dBZ range, which corresponded to there being level 5 thunderstorm or thunderstorms being present in the vicinity of N70BC's last known position.

FAA Advisory Circular AC 00-24B defines level 5 thunderstorms as "intense" with severe turbulence, lightning, hail likely, and organized surface wind gusts.

The NTSB conducted a meteorological study and examined data ,which included surface weather observations, upper air data, weather radar data, satellite data, and in-flight weather advisories. The data when superimposed with N70BC flight track, showed that N70BC penetrated an area of intense weather radar echoes (VIP Level 5), consistent with a thunderstorm.

According to sheriff's deputies, as well as the landowner upon whose property the wreckage was found, there was heavy rain, thunder, lightning, and high winds in the area around the time of the accident.

WRECKAGE AND IMPACT INFORMATION

N70BC impacted the ground in an area at the edge of heavy brush and trees. From the initial impact point, commencing at geographic position 30 degrees 28 minutes 13 seconds north

latitude, 085 degrees 38 minutes 55 seconds west longitude, the debris field was oriented on a heading of about 078 degrees magnetic, and was about 300 feet long, fanning outwards into dense thicket and tall trees.

The initial impact point along the debris field consisted of a large crater of about 40 feet long, and it had an imprint consistent with the shape of the airplane (starting with the left wing tip, wing area, left wing mounted engine, fuselage, right wing mounted engine, remaining right wing area, and right wing tip along the length of the gouge), having impacted in a knife edged fashion, with the left wing tip tank having impacted first. From the initial impact point, downstream, the imprints and signatures were consistent with the general shape of the airplane impacting progressively span-wise along the leading edge starting with the left wing, the left propeller/engine pod, the nose/fuselage area, followed by the right wing and right wing mounted items, outboard to the right wing tip tank.

Within the impact crater, two propeller blades and about a 10-inch section of a propeller blade were found. Both the left and right engines were found within about 15 feet of each other near the initial impact point. Various engine accessories were spread throughout the area adjacent to both engines.

The left engine, serial number 267338, was found positioned upright with the cylinders still attached. The propeller blades had separated at the hub, and examination of the recovered blades revealed extensive damage, to include chord wise scratching, blade face polishing, s-type bending and other signatures and damage, consistent with heavy impact forces. Although extensive impact damage was evident, no preaccident anomalies were noted with this engine that would have prevented normal operation and the production of power. All accessories had detached from the engine, and the accessory portion of the crankcase was damaged, and it too had mostly separated. In addition, the forward portion of the crankcase including the reduction gear and propeller flange, had separated, and had incurred damage, exposing the bent but intact crankshaft, and a counterweight.

All cylinders exhibited cooling fin damage, and cylinders No. 3 and 4 exhibited cylinder head damage as well, and when examined with a lighted bore scope, combustion deposits were noted. The connecting rods had remained intact and connected to the crankshaft and pistons, and connecting rod bearings exhibited normal signatures. The camshaft had incurred impact damage and had separated into two pieces. The induction system and fuel manifold valve were separated. Both magnetos were separated and exhibited extensive impact damage, and the ignition harness had frayed. Top and bottom spark plugs were removed and examined, with the exception of Nos. 1, 3, and 5 spark plugs, and they exhibited normal signatures and wear, when compared to the Champion Check Plug Comparison Chart.

The fuel pump had separated from the left engine and it had incurred extensive damage. The pump drive coupling was missing and the pump drive shaft rotated freely. Neither the fuel manifold valve, nor was the throttle body fuel control unit, were located. In addition, on the left engine, the oil sump and bottom portion of the crankcase had separated from the crankcase, and the exhaust system had been crushed. The oil pump, oil sump, oil pickup tube and screen, and the oil filter were not located.

The starter, started adapter, alternator had separated from the left engine. The turbo charger had incurred impact damage and had separated into two pieces at the turbocharger drive shaft, and neither wheel could be rotated. All turbocharger and compressor blades were bent in the

same direction, consistent with rotation. The vacuum pump separated from the engine and was not located. In addition, the propeller governor had also separated and was not found.

The right engine, serial number 600096, was found embedded into soft mud in an upside down position. The four propeller blades that had separated at the hub, and when recovered were noted to have a mix of chord wise blade scratching, s-type bending, leading and trailing edge gouging, chord wise scoring, and face polishing along with assorted nicks. In addition, one propeller blade was missing about 17 inches of the outboard portion of the blade. The propeller governor had separated from the engine and was not located. Both propeller hub assembly springs were found about 50 feet of the initial impact point, and a propeller blade was located about 100 feet away. The exhaust system had been crushed and had separated.

The engine was recovered with the remaining wreckage and was partially disassembled and examined, and no abnormalities that would have prevented normal operation and production of power, were noted. The accessory portion of the crankcase was damaged and had separated at the top of the case, and the forward portion of the crankcase, including the reduction gear and propeller flange, had incurred damage and had separated.

All cylinders remained attached to the right engine, and they had incurred damage to their cooling fins. Cylinders No. 2, 4, and 6 had incurred damage to the cylinder heads, and when examined with a lighted bore scope combustion deposits were noted. Intake and exhaust valves exhibited normal wear, and the rocker arm area and rocker arms were separated. The crankshaft had remained intact and was bent. The counterweights had remained attached to the hangar blades, and were noted to move freely by hand. Nos. 1, 2, 3, 4, and 6 connecting rods had remained intact, and was connected to the crank shaft and pistons, and when examined they as well as the bearings exhibited normal signatures. The camshaft had separated into two pieces, and the damage noted was consistent with that incurred due to heavy impact. The oil sump and bottom portion of the crankcase had separated. The fuel pump, oil scavenger pump and starter adapter had remained attached to the engine, and the starter had separated from the engine consistent with the impact.

Both magnetos were devoid of harness/electrical leads and had separated from the engine. Externally they exhibited heavy impact damage and all their internal components had been damaged as well. The top and bottom spark plugs were removed and examined. Top and bottom No 4 spark plugs were missing, and the bottom No 3 spark plug was damaged with its electrode area missing. When compared to the Champion Check a Plug chart, the spark plugs exhibited normal signatures and wear. The vacuum pump which was attached to the right engine had separated, consistent with impact forces.

The airframe was completely destroyed and was found to be in many small pieces scattered over the large area of dense vegetation that constituted the accident site. All aircraft pieces at the site were collected, recovered and weighed, and then the wreckage was combed, and pieces were examined, and staged as necessary, to ensure that all of the airplane's structure had been recovered and/or was accounted for. The airplane related wreckage when weighed was found to weigh close to that of the certificated weight, and evidence of each corner of the airplane's airframe was found to be present. The extensive damage precluded the exercise of flight controls to verify continuity, however pieces and/or sections of each of the control surfaces were noted to be present. All cables and control rods exhibited damage consistent with overstress.

MEDICAL AND PATHOLOGICAL INFORMATION

On March 9, 2007, a medical examiner with the District 14 Medical Examiner's Office performed an autopsy on the human remains that were obtained from the wreckage site. According to the medical examiner, the causes of death for all five occupants were attributed to multiple blunt force trauma.

ADDITIONAL INFORMATION

On January 10, 2007, the NTSB released the wreckage pertaining to N70BC to Mr. Todd Thaxton, Recovery Manager, Atlanta Air Salvage, Griffin, Georgia. Ms. Brooke Gammill, Account Manager, Atlanta Air Salvage, has acknowledged receipt of the wreckage.

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	Age:	75, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	No
Medical Certification:	Class 2 Without Waivers/Limitations	Last FAA Medical Exam:	03/01/2005
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	05/01/2006
Flight Time:	15000 hours (Total, all aircraft), 14500 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	Registration:	N70BC
Model/Series:	421B	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	421B0813
Landing Gear Type:	Retractable - Tricycle	Seats:	8
Date/Type of Last Inspection:	11/01/2006, Annual	Certified Max Gross Wt.:	6840 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:	6478 Hours as of last inspection	Engine Manufacturer:	Teledyne Continental
ELT:	Installed	Engine Model/Series:	GTSIO-520-H
Registered Owner:	Island Times LLC	Rated Power:	375 hp
Operator:	Island Times LLC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Day
Observation Facility, Elevation:	PFN	Distance from Accident Site:	
Observation Time:	0853	Direction from Accident Site:	
Lowest Cloud Condition:		Visibility	5 Miles
Lowest Ceiling:	Overcast / 600 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	12 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	190°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.98 inches Hg	Temperature/Dew Point:	22° C / 21° C
Precipitation and Obscuration:	Heavy - Thunderstorms - Rain		
Departure Point:	Destin, FL (DTS)	Type of Flight Plan Filed:	IFR
Destination:	Marsh Harbour (MYAM)	Type of Clearance:	IFR
Departure Time:	0832 CST	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	4 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	5 Fatal	Latitude, Longitude:	30.470556, -85.648611

Administrative Information

Investigator In Charge (IIC):	John W Lovell	Report Date:	12/28/2008
Additional Participating Persons:	Edward DaSilva; FAA FSDO; Birmingham, AL Josha Cawthra; Teledyne Continental Motors; Mobile, AL Emile Lohman; Cessna Aircraft Company; Wichita, KS		
Publish Date:	12/28/2008		
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. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).