National Transportation Safety Board
Aviation Accident Final Report

Location:	LEAGUE CITY, TX	**Accident Number:**	FTW97FA130
Date & Time:	03/19/1997, 2333 CST	**Registration:**	N4050L
Aircraft:	Cessna 421	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The twin engine airplane had been cleared for a night instrument approach to Galveston, Texas, after flying non-stop from San Diego, California, when the pilot reported that he had lost the right engine and did not have much fuel left. The controller vectored the airplane toward the closest airport, and the airplane was approximately 1 mile northeast of that airport when radar contact was lost. A witness observed the airplane enter a spin, descend in a nose down attitude, and impact near the center of a lake. When the pilot filed his flight plan for the cross country flight, he indicated the airplane carried enough fuel to fly for 7 hours and 30 minutes. At the time radar contact was lost, 7 hours and 32 minutes had elapsed since the airplane departed San Diego. Examination of the airplane revealed no evidence of any pre-impact mechanical discrepancies. The landing gear was down, the flaps were extended to about 15 degrees, and neither propeller was feathered. The single engine approach procedure in the airplane owner's manual indicated that the landing gear should be extended when within gliding distance of the field and the flaps placed down only after landing is assured.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to refuel the airplane which resulted in the loss of power to the right engine due to fuel exhaustion, and the pilot's failure to maintain airspeed during the single engine landing approach which resulted in a stall/spin.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: DESCENT - NORMAL

Findings
1. 1 ENGINE
2. (C) FLUID,FUEL - EXHAUSTION
3. (C) REFUELING - NOT PERFORMED - PILOT IN COMMAND

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

Findings
4. PROCEDURES/DIRECTIVES - NOT FOLLOWED - PILOT IN COMMAND
5. (C) AIRSPEED - NOT MAINTAINED - PILOT IN COMMAND
6. STALL/SPIN - INADVERTENT - PILOT IN COMMAND

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

Findings
7. TERRAIN CONDITION - WATER

Factual Information

HISTORY OF FLIGHT

On March 19, 1997, at 2333 central standard time, a Cessna 421 twin engine airplane, N4050L, registered to and operated by MTK Jet of Wilmington, Delaware, impacted water and sank following a loss of control during a single engine approach to Houston Gulf Airport near League City, Texas. The airplane sustained substantial damage, and the instrument rated private pilot, the sole occupant, received fatal injuries. The Title 14 CFR Part 91 personal flight departed Montgomery Field in San Diego, California, en route to Galveston, Texas, 7 hours and 32 minutes before the accident. An IFR flight plan was filed, and dark night visual meteorological conditions prevailed at the time of the accident.

On March 18, 1997, at 1909 Pacific standard time, the pilot telephoned the San Diego Automated Flight Service Station (AFSS) and filed an IFR flight plan for a trip from Montgomery Field to Scholes Field in Galveston with a proposed departure time of 1000 on March 19. He stated that the estimated time en route for the non-stop flight from San Diego to Galveston was 5 hours and 21 minutes and that the airplane carried enough fuel to fly for 7 hours and 30 minutes. After filing the flight plan, the pilot asked for the weather conditions forecast for the next afternoon and was provided with the Galveston Terminal Forecast for that time period. He then requested to file a second flight plan for a continuation of his trip on March 20 from Galveston to Florida, but was advised that since it was more than 24 hours before his proposed departure time from Galveston, he could not file for the second leg at that time.

On March 19, 1997, at 1138, the pilot again telephoned the San Diego AFSS and amended his flight plan to Galveston by changing his proposed departure time to 1230. However, the airplane did not depart San Diego until 1401. According to air traffic control personnel, all services provided to the airplane "were normal and there were no pertinent transmissions" until the airplane was in contact with Houston approach control and had received clearance for an instrument approach to runway 13 at Scholes Field in Galveston.

At 2331 central standard time, the pilot advised Houston approach that "he had lost the right engine and did not have much fuel left." The controller confirmed that the pilot was declaring an emergency and then provided radar vectors to the nearest airport, which was Houston Gulf, instructing the pilot to turn left to a heading of 360 degrees and to descend and maintain 1,600 feet. The controller asked the pilot if the airplane could maintain altitude, and the pilot replied in the affirmative. At 2332, the controller advised the pilot that Houston Gulf Airport was at 12 o'clock and less than 1 mile, and the pilot acknowledged. The controller received no response to a subsequent position advisory and requested a radio check. The pilot's acknowledgment of this transmission was the last recorded radio communication from the airplane.

According to radar track data, during the period of time from 2331:08 to 2332:31, the airplane descended from 2,600 to 900 feet msl (rate of descent 1,230 feet/minute), and its ground speed decreased from 115 to 108 knots (132 to 124 mph). The last radar return, recorded at 2333:13, indicated that the airplane was approximately 1 nautical mile northeast of Houston Gulf Airport. The elapsed time from takeoff in San Diego to the loss of radar contact by Houston approach was 7 hours and 32 minutes.

A witness who was driving his truck southbound on FM 1266 reported that "about the time

[he] passed Tucker Road, [he] heard an airplane engine" and saw the airplane "headed parallel to the road but traveling in a northern direction." He further reported that "the engine noise did not seem normal, it appeared to be spurting or missing." When the airplane was "about 200 yards directly right of [him, it] suddenly sputtered, then took what appeared to be a quick clockwise circle almost in place." The airplane "came out of the single quick circle with its nose headed straight to the ground." He watched the airplane descend in a nose down attitude until "30 to 50 foot high" trees blocked his view. Subsequently, the witness exited his truck, located a place where he could see through the trees, and spotted the airplane in the center of a lake formed from an old sand pit. The airplane's "tail was almost straight up," and its "nose was completely under water and one wing was bent toward the rear."

PERSONNEL INFORMATION

On January 27, 1997, the pilot passed the practical test for the instrument airplane rating. He completed the flight check portion of the test in a Piper PA-44-180, a non-pressurized airplane powered by two 180 horsepower normally aspirated engines. On the FAA Form 8710-1, Airman Certificate and/or Rating Application, completed by the pilot on January 25, 1997, he listed a total flight time of 536 hours and total pilot in command time of 344 hours. Total instrument time listed was 135 hours, and total night flight time listed was 24 hours. The pilot's flight logbooks were not located during the investigation.

AIRPLANE INFORMATION

The pressurized airplane was powered by two 375 horsepower turbocharged Continental GTSIO-520-D engines. According to the maintenance records, the airplane received its last annual inspection on December 21, 1996. At the time of that inspection, the airframe had accumulated 3,421.6 hours since its date of manufacture on January 15, 1968, and the engines had accumulated 467.9 hours since major overhauls on December 5, 1992. Review of the maintenance records by the NTSB investigator-in-charge did not reveal evidence of any uncorrected maintenance discrepancies.

The airplane's total fuel capacity was 312.5 gallons of which 307 gallons were useable. The left and right main tip tanks held 51 gallons each when full with 1 gallon unusable per tank. Left and right auxiliary wing tanks installed by the manufacturer held 50 gallons each when full with 1 gallon unusable per tank. On March 11, 1996, four wing locker fuel tanks, total capacity 75 gallons with 1 gallon unusable, and one nose baggage fuel tank, total capacity 35.5 gallons with 0.5 gallons unusable, were installed.

On May 17, 1996, vortex generators were installed on the wings and vertical stabilizer in accordance with Supplemental Type Certificate (STC) SA00329SE. The STC stated the following:

> NOTE: This installation does not include changes to the airplane stall speed, minimum control speed, rudder deflection angle, or maximum gross weight. Therefore, no Supplemental Airplane Flight Manual (SAFM) was deemed necessary.

According to the line service technician who refueled the airplane at Montgomery Field, it received "a top-off of all tanks: mains, auxiliaries, nacelles, lockers, and the forward-mounted ferry tank" with "100LL avgas" before departing San Diego. The airplane's gross weight at the time of takeoff from Montgomery Field was calculated by the NTSB investigator-in-charge at 7,381 pounds with a center of gravity of 151.6 inches. The original weight and balance report for the airplane prepared by the manufacturer on January 8, 1968, listed the maximum gross

takeoff weight as 6,800 pounds with an allowable center of gravity range at gross weight of 152.0 to 155.5 inches. The airplane's gross weight at the time of the accident was calculated by the investigator-in-charge at 5,539 pounds with a center of gravity of 152.1 inches. According to the original weight and balance report, the allowable center of gravity range at 5,500 pounds was 145.7 to 155.8 inches.

Review of the Single Engine Climb Data table contained in the Cessna 421 Owner's Manual indicated that at a gross weight of 5,550 pounds, at sea level and 59 degrees F, the airplane was capable of climbing at 606 feet per minute if a best climb indicated airspeed (IAS) of 114 mph was used. This rate of climb was achieved with the landing gear and flaps retracted, the inoperative engine's propeller feathered, the wing banked 5 degrees toward the operating engine, and 39.5 inches Hg manifold pressure on the operating engine.

The emergency procedures section of the owner's manual included the following checklist for an engine inoperative approach:

(1) Approach at 125 MPH IAS with excessive altitude. (2) Landing Gear - EXTEND when within gliding distance of field. (3) Wing Flaps - DOWN when landing is assured. (4) Decrease speed below 115 MPH IAS only if landing is assured. (5) Minimum Single-Engine Control Speed - 107 MPH IAS.

METEOROLOGICAL INFORMATION

At 2345, the reported weather conditions at Ellington Field in Houston, Texas, located 8 nautical miles northwest of the accident site, were wind from 310 degrees at 8 knots, visibility 10 statute miles, ceiling 1,900 feet overcast, temperature 9 degrees C (48 degrees F), dewpoint 6 degrees C (43 degrees F), and altimeter setting 30.16 inches of Hg.

At 2352, the automated weather observation at Scholes Field in Galveston, Texas, located 17 nautical miles southeast of the accident site, was wind from 330 degrees at 11 knots, visibility 10 statute miles, ceiling 2,000 feet broken, 2,700 feet overcast, temperature 12 degrees C (54 degrees F), dewpoint 8 degrees C (46 degrees F), altimeter setting 30.15 inches of Hg.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest in a lake at the intersection of FM 1266 and Tucker Road approximately 1 mile northeast of the Houston Gulf Airport. On March 28, 1997, the Texas Department of Public Safety's Dive Recovery Team raised the airplane to the surface of the sand pit. On March 29, 1997, the airplane was towed to the bank, removed from the water by a crane, and examined and photographed by an FAA inspector prior to being disassembled for transport to Air Salvage of Dallas in Lancaster, Texas. On April 1, 1997, the airplane was examined at Air Salvage of Dallas under the supervision of the NTSB investigator-in-charge.

Review of the photos taken by the FAA inspector on March 29, 1997, revealed the following information regarding the condition of the airplane prior to its disassembly. The right wing remained attached at the wing root and was bent down outboard of the engine nacelle. The left wing was separated at the wing root and remained attached to the fuselage only by control cables and electrical wiring. Additionally, the tip tank was separated from the left wing, and the bottom skins of the left wing and the lower cowling of the left engine were deformed upward. The nose section of the fuselage (forward of the pressure bulkhead) was partially separated, and the forward left side of the cabin was crushed inward. Both engines remained attached to their respective mounts, and both propellers remained attached to their respective

engines.

Further examination of the photos and discussions with personnel involved in the recovery operation yielded the following additional information. When the airplane was removed from the water, the main cabin door was found open, and a hole was present in the fuselage skin immediately forward of the door. According to dive team personnel, they made the hole and opened the door to gain access to the cabin. Initial examination of the cockpit by the FAA inspector revealed that the left throttle was in the full forward position, and the right throttle was in a midrange position. Both propeller controls were in the full forward (low pitch) position, and both mixture controls were in a midrange position. The landing gear control was in the "DOWN" position, and all three gear were found extended and locked.

An inventory conducted on April 1, 1997, revealed that all structural components of the airplane, including all control surfaces, were recovered from the sand pit. Flight control continuity could not be confirmed due to the removal of the wings, horizontal stabilizer, and elevators. Examination of the flap actuation system revealed that the flap chains were in a position that equated to approximately 15 degrees of flaps. Items found in the airplane included: an empty fuel bladder, a life raft and survival kit, plastic file holders containing maps and approach plates, a laptop computer, and personal baggage.

During examination of the left engine on April 1, 1997, it was noted that the left side exhaust pipes were crushed. The propeller mounting flange was rotated and continuity was established to all cylinders and to the accessory drive gears. A compression test was performed and all cylinders exhibited compression. The throttle body fuel screen contained a small amount of debris and no fuel. The fuel manifold screen was clean, and fuel and water were found in the manifold. The fuel pump was free to rotate and fuel and water were present in the lines. According to the engine manufacturer's representative, the spark plugs displayed "moderate wear" and "moderate deposits." Both magnetos were timed at 22 degrees before top dead center. The turbocharger, the vacuum pump, and the oil pump gears were free to rotate. No metal was noted in the oil filter element. No damage was noted to two blades of the left propeller, and the other blade was bent forward approximately 90 degrees near the tip.

During examination of the right engine on April 1, 1997, no external damage was noted except a dent in the #5 intake pipe. The propeller mounting flange was rotated and continuity was established to all cylinders and to the accessory drive gears. A compression test was performed and all cylinders exhibited compression. The throttle body fuel screen was clean and no fuel was noted. The fuel manifold screen was clean and no fuel was noted. The fuel pump was free to rotate and no fuel was found in the lines. According to the engine manufacturer's representative, the spark plugs displayed "moderate wear" and "light deposits." Both magnetos were timed at 20 degrees before top dead center. The turbocharger, the vacuum pump, and the oil pump gears were free to rotate. No metal was noted in the oil filter element. No damage was noted to two blades of the right propeller, and the other blade was loose in the hub and bent forward approximately 90 degrees near the tip.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was performed by William E. Korndorffer, MD, Chief Medical Examiner, at the Galveston County Medical Examiner's Office in Texas City, Texas, on March 20, 1997. Postmortem toxicological tests performed by the FAA's Civil Aeromedical Institute were negative for carbon monoxide, cyanide, and volatiles (alcohol). Pseudoephedrine and

phenylpropanolamine (over-the-counter decongestants) were detected in urine. The FAA Southwest Regional Deputy Flight Surgeon stated that these findings "are insignificant. However, the underlying medical condition for which these medications were being taken may have caused discomfort or a distraction to the pilot."

ADDITIONAL INFORMATION

The wreckage was released to a representative of the owner on May 19, 1997.

Pilot Information

Certificate:	Private	**Age:**	46, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	08/30/1996
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	536 hours (Total, all aircraft), 344 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N4050L
Model/Series:	421 421	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	421-0050
Landing Gear Type:	Retractable - Tricycle	**Seats:**	8
Date/Type of Last Inspection:	12/21/1996, Annual	**Certified Max Gross Wt.:**	6800 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	GTSIO-520-D
Registered Owner:	MTK JET	**Rated Power:**	375 hp
Operator:	MTK JET	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	EFD, 34 ft msl	**Distance from Accident Site:**	9 Nautical Miles
Observation Time:	2345 CST	**Direction from Accident Site:**	300°
Lowest Cloud Condition:	Unknown / 0 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	Overcast / 1900 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	9°C / 6°C
Precipitation and Obscuration:			
Departure Point:	SAN DIEGO, CA (MYF)	**Type of Flight Plan Filed:**	IFR
Destination:	GALVESTON, TX (GLS)	**Type of Clearance:**	IFR
Departure Time:	1401 PST	**Type of Airspace:**	Class G

Airport Information

Airport:	HOUSTON GULF (SPX)	**Runway Surface Type:**	
Airport Elevation:	22 ft	**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:		**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	GEORGIA R SNYDER	**Report Date:**	04/10/1998
Additional Participating Persons:	JACQUES H LONCHAMBON; HOUSTON, TX JOHN T KENT; MOBILE, AL RANDY L VANDENHUL; 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.ntsb.gov/pubdms/.		