National Transportation Safety Board
Aviation Accident Final Report

Location:	Graham, TX	**Accident Number:**	FTW02FA036
Date & Time:	11/12/2001, 2324 CST	**Registration:**	N6134A
Aircraft:	Piper PA-31T1	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General Aviation - Executive/Corporate		

Analysis

At 2144, the pilot contacted air traffic control and requested visual flight rules (VFR) flight following to his destination. The flight was the final leg of a four-leg trip, which the pilot had begun approximately 1120 that morning. At 2220, the flight began a slow descent toward the destination airport. Radar data confirmed that the airplane executed a steady descent, and flew a straight line course toward Graham. The final radar return occurred 37 minutes later at an altitude of 3,000 feet (radar coverage is not available below 3,000 feet), 8 miles southeast of the Graham Municipal Airport. Two minutes after the final radar return, the pilot reported to air traffic control that the flight was two miles out, and he canceled VFR flight following. No further communications or distress calls were received from the airplane. The pilot did not request or receive updated weather from the air traffic controllers during the flight. According to witnesses who lived near the accident site, they heard an airplane flying low, observed dense fog and heard the sounds of an airplane crashing. According to the nearest weather reporting station, near the time of the accident, the temperature- dew point spread was within 2 degrees, visibilities were reduced to between 3 and 4 miles in fog, and the ceiling was decreasing from 600 feet broken to 400 feet overcast. At the time of the accident, the pilot's duty day exceeded 12 hours. Examination of the airframe revealed no preimpact anomalies and that the gear was extended and the flaps were retracted. Examination of both engines revealed evidence of power at the time of impact.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to discontinue the approach after encountering instrument meteorological conditions, which resulted in controlled flight into terrain. Contributing factors were the dark night light condition, low ceiling, and reduced visibility due to fog.

Findings

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

Findings
1. VFR FLIGHT INTO IMC - INADVERTENT - PILOT IN COMMAND
2. FATIGUE(FLIGHT AND GROUND SCHEDULE) - PILOT IN COMMAND
3. (F) LIGHT CONDITION - DARK NIGHT
4. (F) WEATHER CONDITION - FOG
5. (F) WEATHER CONDITION - LOW CEILING

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: APPROACH

Findings
6. (C) VFR FLIGHT INTO IMC - CONTINUED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On November 12, 2001, at 2324 central standard time, a Piper PA-31T1 twin engine airplane, N6134A, was destroyed when it impacted terrain during an approach to the Graham Municipal Airport, Graham, Texas. The airplane was registered to Cage Acquisitions Inc., of Graham, Texas, and was operated by the pilot. The instrument-rated private pilot, and his three passengers, sustained fatal injuries. Dark night instrument meteorological conditions prevailed, and a flight plan was not filed for the 14 Code of Federal Regulations Part 91 business flight. The cross-country flight originated from the Wharton Regional Airport, Wharton, Texas, at 2144, and was destined for the Graham Municipal Airport.

According to air traffic control transcripts, at 1123:17, the flight departed from Graham and flew to Wharton on an instrument flight rules (IFR) flight plan. The flight then departed Wharton and flew to Odessa, Texas. At 1703:40, the pilot was on the ground at Odessa and contacted the San Angelo Automated Flight Service Station (SGT AFSS). He requested an IFR weather briefing for a return flight from Odessa to Wharton, with an estimated departure time of 1800. The pilot was informed of the weather en route, which included a trough of low pressure over west Texas that was moving south from the northwest. At 1917:05, the pilot was still on the ground at Odessa due to late arriving passengers; he again contacted the SGT AFSS and requested an updated weather briefing for the flight from Odessa to Wharton. He was informed of the weather en route, which included weather at the Brazoria County Airport (36 miles southeast of Wharton), Angleton, Texas, which was reporting visibility 5 miles in mist and a one degree temperature dew point spread. Subsequently, at 1930 the flight departed for Wharton. At 2028:59, Houston Air Route Traffic Control Center (HOU ARTCC) requested that the flight verify altitude, and the pilot replied that they were at eighteen thousand, "but we're we got a problem our autopilot just went off for some reason." At 2032:10 the flight reported to HOU ARTCC that the problem had been corrected. No further anomalies were reported by the pilot or observed by air traffic controllers. During the approach into Wharton the pilot was issued current weather for the William P. Hobby Airport, Houston, Texas, (52 miles northeast of Wharton) which was reporting visibility seven miles and a two degree temperature dew point spread. Approximately 2110:00, the airplane arrived at Wharton.

The flight departed for the final leg from Wharton to Graham. At 2144:23, the pilot contacted the Houston Air Route Traffic Control Center (HOU ARTCC) while en route to Graham and requested visual flight rules (VFR) flight following. At 2220:30, the airplane was instructed to contact the Fort Worth ARTCC. At 2233:14, the pilot requested and was approved to begin a slow descent toward the Graham Municipal Airport. The radar data confirmed that the airplane executed a steady descent, and flew a straight line course toward Graham. The final radar return occurred at 2257:09 at an altitude of 3,000 feet (radar coverage is not available below 3,000 feet), 8 miles southeast of the Graham Municipal Airport. At 2259:06 the pilot reported to FTW ARTCC that the flight was two miles from Graham and he canceled VFR flight following. No further communications or distress calls were received from the airplane. The pilot did not request or receive updated weather from the HOU or FTW ARTCC controllers during this flight. This data confirms that the pilot's duty day exceeded 12 hours at the time of the accident.

One witness, who was located southwest of the airport, reported that at 2258 she heard the

airplane fly "extremely low" over her house. She stated that the motor sounded rough, but not missing. The airplane flew two miles southeast of the airport, turned to the north, and flew east of the airport. The witness then heard the sounds of crashing.

A second witness, who was located approximately 5 miles west of the airport, reported that the airplane over flew her house approximately 2300. She did not see the airplane; however, it sounded "unusually low and slow." She added that fog existed at the time she heard the airplane over fly her house.

Another witness reported that, at a few minutes past 2300 he was preparing to retire for the evening and looked outside. He stated that there was dense fog. Approximately 20 minutes later he heard a "faint" crashing sound.

On Tuesday, November 13, 2001, concerned family members notified Young County law enforcement authorities that the airplane had not arrived at the Graham Municipal Airport. Subsequently, a search was initiated. The Young County Sheriff's Office, Graham Police Department, Graham Fire Department, Texas Parks and Wildlife Game Wardens, Civil Air Patrol, and numerous volunteers participated in a two-day search for the airplane. On Thursday November 15, 2001, at 1500, a search helicopter located the accident site 12 miles northeast of the airport.

PERSONNEL INFORMATION

The 66-year old pilot was issued a private pilot certificate on December 14, 1977. He held airplane single and multi-engine landing ratings and an instrument rating. The pilot was issued an FAA third class medical certificate on December 2, 1999, which stipulated that the pilot must wear corrective lenses while exercising the privileges of his airman certificate. On the application for that medical certificate, the pilot reported that he had accumulated a total of 4,849 hours. The pilot's logbook was not located during the investigation. According to a friend of the pilot, the pilot had previously flown other models of the PA-31. The pilot was employed by Cage Acquisitions Inc. to fly the accident airplane, and was also a constable in Young County, Texas.

The owner of Cage Acquisitions Inc., who was a passenger on the airplane, was also the owner of Tommy's Well Service, Inc. of Graham, Texas. The owner was an independent oilman residing in Graham.

The two additional passengers resided in Graham, and were doing business with Tommy's Well Service.

AIRCRAFT INFORMATION

The 1978 airplane was powered by two Pratt and Whitney PT6A-11 turboprop engines driving two constant speed, full feathering Hartzell propellers. The airplane's airframe, powerplant, and propeller logbooks were not located during the course of the investigation. Maintenance records were located and obtained from Crownair in San Diego, California, and Abilene Aero, Inc., in Abilene, Texas.

According to copies of maintenance logbook entries provided by Crownair, on August 7, 2001, the airframe, left engine (serial number 10010), and right engine (serial number 10007), underwent 100 hour inspections (event 1 and 2), in accordance with the Piper Progressive Inspection Program. Additionally, the 100 hour and 300 hour special inspection requirements were performed. At the time of the inspection the airframe and engines had accumulated a

total of 3,240.3 hours, and both engines had accumulated a total of 889.3 hours since the last hot section inspection.

On October 9, 2001, the airplane was purchased by Cage Acquisitions, Inc.

According to copies of maintenance logbook entries, provided by Abilene Aero, Inc., between October 26, 2001, and November 9, 2001, the airplane underwent maintenance. A Garmin GNS-430 unit (serial number 97104092) was installed in the airplane, the ADF was replaced, the #2 VOR was repaired, the roll servo for the autopilot was replaced, the RNAV was repaired, and the DME was relocated in the cockpit. Additionally, a new right main outboard fuel cell and a right main fuel quantity transmitter were installed. At the time that the maintenance was performed, the airframe had accumulated a total of 3267.0 hours.

AERODROME INFORMATION

The Graham Municipal Airport (E15) is a non-towered airport that has an NDB and GPS approach to runway 21. The full approach consists of a left hand procedure turn northeast of the airport, prior to turning inbound on a course of 215 degrees. The straight-in landing minimums for a category A aircraft are a ceiling of 647 feet (847 feet if the local altimeter setting is not available) and a visibility of one mile. Runway 21 is equipped with medium intensity runway lights (MIRL) and a visual approach slope indicator (VASI).

METEOROLOGICAL INFORMATION

At 2153, the weather observation facility located at the Mineral Wells Municipal Airport (MWL), Mineral Wells, Texas, (located 30 miles southeast of the accident site) reported clear skies, visibility 4 statute miles in mist, temperature 59 degrees Fahrenheit, dew point 59 degrees Fahrenheit, wind from 140 degrees at 9 knots, and an altimeter setting of 30.20 inches of Mercury.

At 2241, the weather observation facility at MWL issued a special weather report, which reported scattered clouds at 600 feet, broken cloud layers at 1,200 feet and 7,000 feet, temperature 59 degrees Fahrenheit, dew point 57 degrees Fahrenheit, and an altimeter setting of 30.20 inches of Mercury.

At 2253, the weather observation facility at MWL reported ceiling 600 feet broken, 7,000 broken, visibility 4 statue miles in mist, temperature 57 degrees Fahrenheit, dew point 57 degrees Fahrenheit, wind from 140 degrees at 8 knots and an altimeter setting of 30.20 inches of Mercury.

At 2319, the weather observation facility at MWL issued another special weather report, which reported an overcast ceiling at 400 feet, wind from 150 degrees at 9 knots, visibility 3 statute miles in mist, temperature 59 degrees Fahrenheit, dew point 57 degrees Fahrenheit, and an altimeter setting of 30.20 inches of Mercury.

Two witnesses who lived in the vicinity of the accident site reported that, between 2300 and 2330 they observed dense fog.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the Office of the Chief Medical Examiner of Fort Worth, Texas. The report stated that the cause of death was "blunt force trauma to the head due to [a] light aircraft crash." Toxicological testing was performed by the FAA's Civil Aeromedical Institute of Oklahoma City, Oklahoma. The tests results revealed 101.982 (ug/ml

ug/g) Salicylate (the active ingredient for aspirin) detected in a urine sample. The tests were negative for carbon monoxide, cyanide, and ethanol.

WRECKAGE AND IMPACT INFORMATION

The accident was situated 12 statute miles northeast of the Graham Municipal Airport, near the location where the procedure turn for an instrument approach to runway 21 would be executed. A global positioning system (GPS) revealed that the accident site was at latitude 033 degrees 15.202 minutes North and longitude 098 degrees 26.858 minutes West. The energy path was oriented on magnetic heading of 130 degrees and was 395 feet in length from the initial ground impact scar to the final airplane component. The energy path was along mesquite brush covered ground, which displayed sooting and thermal damage from a fire. The right horizontal stabilizer, which was wrapped around the base of a tree trunk, came to rest 56 feet aft of the initial ground impact scar. The left horizontal stabilizer and vertical stabilizer came to rest at the 110-foot mark (all distances measured from the initial ground impact scar). The outboard portion of the right wing, including the aileron and wing-tip fuel tank, separated from the airframe and came to rest at the 200-foot mark. The right engine's gas generator section and propeller assembly came to rest at the 230-foot mark and the right engine's compressor section came to rest at the 295-foot mark. The outboard portion of the left wing, the left engine, and the left propeller assembly separated from the airframe, and came to rest at the 300-foot mark. The cabin, both inboard wing sections, and the empennage also came to rest at the 300-foot mark, and were consumed by fire. The final airplane component along the energy path was the left main landing gear, at the 395-foot mark.

The left engine was found separated from the airframe; however, remained intact. The gas generator outer casing was twisted. The exhaust manifold was removed and the power turbine blades were observed. Each of the power turbine blades were damaged, commencing approximately 2/3 outboard from the blade root. The exhaust duct exhibited twisting, consistent with power production at the time of impact.

The three blades for the left propeller assembly remained secure in the propeller hub; however, the propeller assembly separated from the left engine. The fracture surface of the propeller shaft exhibited a 45-degree shear lip, consistent with overstress. All three propeller blades exhibited "S" type bending and chordwise scratches.

The right engine was found separated from the airframe, in three sections. The compressor section separated and remained intact as one piece. The compressor stators were twisted and flattened. The power section and forward portion of the gas generator section separated 11 inches aft of the "C" flange; however, remained intact as one section. The gas generator's outer casing was twisted. The exhaust duct exhibited twisting, consistent power production at the time of impact. The accessory gear box separated from the engine and was consumed by fire.

The three propeller blades for the right propeller assembly remained attached to the propeller hub, and the propeller assembly remained attached to the right engine. All three propeller blades exhibited "S" type bending and chordwise scratches. One propeller blade tip was separated from a point 13 inches inboard from the blade tip. The separated blade tip was recovered at the accident site. Both fracture surfaces were consistent with overload.

The cockpit, cabin and aft cargo were consumed by fire, therefore, no instrument readings, gauge readings, or switch positions could be recorded.

Flight control continuity could not be established due to the fragmentation of the airframe;

however, examination found no evidence of pre-impact airframe anomalies. According to the representative from The New Piper Aircraft Inc., the flaps were retracted, the landing gear was extended, and the cabin door's actuator was found in the closed position.

ADDITIONAL INFORMATION

A friend of the pilot reported that the pilot had been practicing using the airplane's new Garmin 430 GPS on a home computer; however, this would have been the pilot's second flight using the GPS. The software, including CD, that the pilot was using to practice was forwarded to the NTSB; however, there was no information that assisted investigators in determining which approaches or navigation was practiced by the pilot.

The airplane was released to the registered owner on February 15, 2002.

Pilot Information

Certificate:	Private	**Age:**	66, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	12/02/1999
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	4849 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N6134A
Model/Series:	PA-31T1	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	31T-7804006
Landing Gear Type:	Retractable - Tricycle	**Seats:**	8
Date/Type of Last Inspection:	08/07/2001, 100 Hour	**Certified Max Gross Wt.:**	9050 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo Prop
Airframe Total Time:	3240.3 Hours as of last inspection	**Engine Manufacturer:**	Pratt & Whitney Canada
ELT:	Installed, not activated	**Engine Model/Series:**	PT6A-11
Registered Owner:	Cage Acquisitions Inc.	**Rated Power:**	680 hp
Operator:	On file	**Operating Certificate(s) Held:**	None
Operator Does Business As:	N/A	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	MWL, 973 ft msl	**Distance from Accident Site:**	30 Nautical Miles
Observation Time:	1053 CST	**Direction from Accident Site:**	135°
Lowest Cloud Condition:	Unknown	**Visibility**	4 Miles
Lowest Ceiling:	Broken / 600 ft agl	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.2 inches Hg	**Temperature/Dew Point:**	15°C / 14°C
Precipitation and Obscuration:	Fog; Haze; No Precipitation		
Departure Point:	Wharton, TX (5R5)	**Type of Flight Plan Filed:**	None
Destination:	Graham, TX (E15)	**Type of Clearance:**	VFR
Departure Time:	2144 CST	**Type of Airspace:**	Class G

Airport Information

Airport:	Graham Municipal (E15)	**Runway Surface Type:**	Unknown
Airport Elevation:	1123 ft	**Runway Surface Condition:**	Unknown
Runway Used:		**IFR Approach:**	Unknown
Runway Length/Width:		**VFR Approach/Landing:**	Unknown

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:**	33.256667, -98.447222

Administrative Information

Investigator In Charge (IIC):	Jason A Ragogna	**Report Date:**	04/15/2003
Additional Participating Persons:	Curt F Mahaffey; Federal Aviation Administration (FSDO); Fort Worth, TX Michael McClure; The New Piper Aircraft; Arlington, TX Fletcher Sharp; Pratt & Whitney Canada; Addison, TX		
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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/.		