Aviation Investigation Final Report

Location:	Duncan, Oklahoma	**Accident Number:**	FTW02LA052
Date & Time:	December 12, 2001, 22:31 Local	**Registration:**	N127CA
Aircraft:	Piper PA-23-250	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

The instrument rated commercial pilot received a weather briefing for a positioning flight. His weather briefing included an Airmet for IFR conditions, calm winds, visibility of 1/4 mile, fog, low ceilings, and matching temperature and dew points. The flight departed the airport and the pilot received radar vectors to the initial approach fix (IAF), was cleared for the localizer approach, and issued the altimeter setting. The IAF is 5.0 nautical miles from the runway threshold and the minimum decision altitude is 1,600 feet (503 feet agl), with a minimum approach visibility of 1 mile. Subsequently, the controller noted static on his radio frequency and a power fluctuation at the facility. The power company recorded a power fault. Radio contact could not be established with the pilot. The airplane struck power lines (38 feet 6 inches agl) and impacted the terrain short of the runway. Power line cables were found entangled about the fuselage and the horizontal stabilizer. Following the accident, the LOC approach was flight checked satisfactory by the FAA. The REIL's were inoperative. Flight control continuity was confirmed. The cockpit approach receivers, indicators, and communication equipment were checked and no anomalies were noted that would have affected the approach. No anomalies were found with the vacuum pumps, airframe, or engine that would have precluded operation prior to the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's descent below the minimum descent altitude, and his failure to maintain obstacle clearance. Contributing factors were the below approach/landing minimum weather, the dark night conditions, and the inoperative REIL's.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: APPROACH - FAF/OUTER MARKER TO THRESHOLD (IFR)

Findings
1. (C) MINIMUM DESCENT ALTITUDE - BELOW - PILOT IN COMMAND
2. CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
3. OBJECT - WIRE,TRANSMISSION
4. (F) WEATHER CONDITION - BELOW APPROACH/LANDING MINIMUMS
5. (F) FACILITY,INADEQUATE INSTRUMENT LIGHTING - AIRPORT PERSONNEL
6. (F) LIGHT CONDITION - DARK NIGHT

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
7. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On December 12, 2001, approximately 2231 central standard time, a Piper PA-23-250 twin-engine airplane, N127CA, operating as Swiftwing 200, struck power lines and terrain at the Duncan/Halliburton Field (DUC) near Duncan, Oklahoma, during a localizer (LOC) approach. The airplane was operated by Safewing Aviation Company, Inc., of Kansas City, Missouri, and was registered to Delta Sales Company of Davenport, Iowa. The positioning flight, which was operating under 14 Code of Federal Regulations (CFR) Part 91, departed Wiley Post Airport (PWA), Oklahoma City, Oklahoma, about 2130 with a destination of DUC. The instrument rated commercial pilot received serious injuries, and the airplane sustained substantial damage. Night instrument meteorological conditions prevailed for the flight, and an instrument flight rules (IFR) flight plan was filed with PWA as the alternate.

Prior to the flight, the pilot called the McAlester Automated Flight Service Station (AFSS) at 2126:24 and received his requested abbreviated weather briefing on the current conditions for southern Oklahoma including DUC and Lawton. The pilot was briefed on an Airmet for IFR conditions throughout the night with the current conditions at DUC showing wind calm, visibility 1 1/2 mile, fog, ceiling broken clouds at 100 feet, temperature and dew point equal at 6 degrees Celsius (43 degrees Fahrenheit). The DUC AWOS was showing wind calm, visibility 1/4 mile, fog, 100 scattered clouds, ceiling broken at 1,000 feet, temperature and dew point at 4 degrees Celsius (39 degrees Fahrenheit). The Chickasha Airport, located approximately 35 nautical miles north of DUC, reported a ceiling of 100-foot overcast, 1/4 mile visibility. The Fort Sill (Lawton) Airport, located approximately 24 nautical miles northwest of DUC, reported a 1,200-foot broken ceiling with 3/4 mile visibility and mist.

The pilot of Swiftwing 200 requested and received radar vectors from the Fort Sill approach controller. At 2227, the flight was 2-3 miles south of the initial approach fix (IAF)(GYROE) and was cleared for the localizer 35 approach. Approximately 2229, Swiftwing 200 was identified at GYROE, and cleared to change to the airport advisory frequency (122.8 Megahertz). Approximately 2231, the controller noted static on his radio frequency and a power fluctuation at the approach facility. Subsequently, radio contact could not be established with Swiftwing 200. The approach facility personnel contacted the fixed base operator (FBO) at the airport, who reported that the airplane had not landed at the airport. Search and rescue was initiated by Fort Sill and airport personnel.

A witness/company pilot, who was located at the approach end of runway 35 in his vehicle, with a handheld radio turned to the frequency of 122.8 Megahertz (MHz), reported that he heard the pilot of Swiftwing 200 report reaching GYROE, and transmit "Duncan traffic Swiftwing 200 GYROE inbound, are the lights full intensity." The witness replied "Roger

Swiftwing 200." At 2232, according to the clock in his vehicle, the witness observed the airport power fluctuations with the airport lights. When Swiftwing 200 did not land, the witness initiated a search for Swiftwing 200.

The pilot reported that his weather briefing indicated fog at the destination airport. En route, the pilot noted patchy fog, and during the controller's vector of the airplane, he recalled seeing the entire airport. He recalled the following sequence: descent to 2,700 feet, base leg, localizer intercept, the approach clearance, approach checklist, seeing the runway and continuing the descent, respectively.

Personnel of the power company reported the height of the power lines was 38 feet 6 inches above the ground (AGL) at the point of impact. Physical evidence at the accident site was consistent with the aircraft striking the electrical static wires near mid-span between two H-frame structures, which were approximately 47 feet 6 inches agl. The power company recorded a power spike (fault) at 22:31:11 on the night of the accident.

PERSONNEL INFORMATION

A review of FAA records and company data revealed that the pilot was issued a first class medical certificate without limitations on June 28, 2001. The commercial pilot held airplane single-engine land, twin-engine land, and instrument ratings. He was a certificated flight instructor for the single-engine land and instrument ratings.

The pilot was employed by Safewing Aviation Company, Incorporated, in July 2001, and he completed their training program for the PA-23 airplane. He satisfactorily completed the CFR Part 135 airman competency/proficiency check in a PA-23-250 airplane on July 16, 2001.

According to the company records and the Pilot/Operator Aircraft Accident report (NTSB 6120.1), the accumulated flight time at the time of employment, was 1,211.9 hours, of which 199.3 hours were the pilot-in-command of multiengine land airplanes. At the time of the accident, the accumulated flight time was 1,660.5 hours of which 45.3 hours was actual instrument flight time. The accumulated flight time for the pilot under CFR Part 135 was 423.7 hours.

At the time of the accident, the company was authorized to conduct on demand operations under CFR Part 135. The company operated 3 multiengine airplanes for passenger and/or cargo flight, and 6 single-engine aircraft for cargo only flights. The airplane, N127CA was flown on two round trip cargo flights Monday through Friday of each week. Three pilots rotated the flights. The commercial pilot of Swiftwing 200 flew both round trip cargo flights on the day of the accident. The first route trip of the day consisted of four segments: DUC to LAW, LAW to OKC, OKC to TUL, and TUL to DUC. The second route trip of the day consisted of four segments: DUC to OKC, OKC to TUL, TUL to OKC, and OKC to DUC. During the second route trip, on the day of the accident, Swiftwing 200 diverted to PWA due to weather at OKC during the TUL to OKC route segment.

AIRCRAFT INFORMATION

The original registration number, N40365, was changed to N7FV in 1975, and to N127CA prior to the accident date. The Piper PA-23-250 airplane, serial number 27-7305125, was registered to the current owner on December 29, 1999. The aircraft was maintained under CFR Part 135 by Safeway Aviation Company, Inc. The last annual inspection was performed on August 1, 2001, at a total airframe time of 8,611 hours (Hobbs 2,695 hours). The accumulated time on the aircraft at the time of the accident was 8,664 hours (53 hours since the last annual inspection).

The left engine, a Lycoming IO-540-C4B5, serial number L-11296-48, was overhauled at T.W. Smith Engine Company., Inc., Cincinnati, Ohio, and re-installed in June 1996. At the last annual inspection, this engine had accumulated 730 hours since major overhaul (SMOH), the left propeller, a Hartzell HC-E2R-2RBSF, serial number BP3570, had accumulated 470 hours SMOH.

The right engine, a Lycoming IO-540-C4B5, serial number L-8996-48, was overhauled at T. W. Smith Engine Company., Inc., Cincinnati, Ohio, and re-installed in June 1996. At the last annual inspection, this engine had accumulated 730 hours SMOH, the right propeller, serial number 54, had accumulated 720 hours SMOH.

In May 1978, the navigation equipment was installed. In April 1983, an overhauled turn coordinator was installed. In March 1984, the right vacuum pump was replaced. In April 1986, the manifold pressure gage was replaced. In February 1987, the standby horizon was replaced with an overhauled unit. In September 1999, the HSI on the left instrument panel was installed following repair. In October 1999, the Apollo model GX-50-GPS unit was installed and interfaced with the HSI via MD41-724 annunciator panel. In August 2000, the ADF was removed and replaced with an overhauled unit. In November 2000, the directional gyro was removed, repaired, and re-installed. In February 2001, the left vacuum pump was replaced. In August 2001, the altimeter was certified.

METEOROLOGICAL INFORMATION

At 2005, the Automated Weather Observation System (AWOS) at DUC recorded the wind from 110 degrees at 3 knots, 1/4 statute mile visibility, fog, ceiling broken at 100 feet, overcast at 3,900 feet, temperature 9 degrees Centigrade (C.) (48 degrees Fahrenheit), dew point 9 degrees C., and the altimeter 29.95 inches of Mercury.

At 2105, the AWOS at DUC recorded calm wind, 1/4 statute mile visibility, fog, ceiling overcast at 100 feet, temperature 6 degrees C. (43 degrees Fahrenheit), dew point 6 degrees C., and the altimeter 29.97 inches of Mercury.

At 2205, the AWOS at DUC recorded calm wind, 1/4 statute mile visibility, fog, ceiling overcast at 100 feet, temperature 5 degrees C. (41 degrees Fahrenheit), dew point 5 degrees C., and the

altimeter 29.97 inches of Mercury.

At 2235, the AWOS at DUC recorded calm wind, 1/4 statute mile visibility, fog, overcast ceiling at 100 feet, temperature 5 degrees C., dew point 5 degrees C., and the altimeter 29.99 inches of Mercury. Airport personnel and local authorities reported areas of dense patchy fog in the general vicinity of the airport.

AERODROME INFORMATION

The Duncan/Halliburton Field (DUC), Latitude 34 degrees 28.25 minutes north; Longitude 97 degrees 57.59 minutes west, is a non-towered airport with one runway, runway 17/35. Runway 17/35 is a concrete surfaced runway, 6,650 feet long, and 100 feet wide. The airport elevation is 1,113 feet, and runway 35 has a touchdown zone elevation of 1,097 feet. Runway 35 is equipped with a runway end identified lights (REIL) lighting system and 2.94 degree glide path angle 4-box visual approach slope indicator (VASI) on the left side of the runway. The medium intensity runway lights (MIRL) runway lights are pilot activated on the common traffic advisory frequency (CTAF) 122.8 Megahertz. A timer operates the runway lights and the taxiway lights; however, the intensity of the runway lights may be changed when the pilot keys the airplane microphone over the CTAF.

Runway 35 is served by a non-precision LOC, with the IAF identified as GYROE (radar fix), 5.0 nautical miles from the runway threshold. The IAF altitude is 2,700 feet (1,603 feet agl) with a final approach course of 352 degrees and a minimum descent altitude of 1,600 feet (503 feet agl) with the Fort Sill altimeter setting. Minimum visibility for the approach is 1 mile.

Following the accident, at the request of the NTSB investigator-in-charge (IIC), the airport operations manager issued a NOTAM for the LOC 35 approach out of service pending an FAA flight check of the approach. On December 14, 2001, the approach was flight checked satisfactory by the FAA. The FAA flight inspection report stated that the AWOS was operative although a NOTAM was issued for the AWOS being out of service. The AWOS was broadcasting an altimeter setting (30.87 inches of Mercury) while Ft Sill Approach reported 29.82 inches of Mercury. Unicom stated that a NOTAM was issued for the REIL inoperative, although a NOTAM was not found by the FAA. The VASI averaged angle after 3 altimetry runs was 3.23 degrees (angle out of tolerance high). Airport/Facility Directory (A/FD) effective 0901Z November 1 2001, page 123, for DUC, runway 35 list obstacles as "trees", and runway 17 obstacle as "power lines."

Following the FAA flight check, the NTSB IIC requested and reviewed the functional history of the airport facility. The DUC AWOS and LOC (runway 35) are non-federally (municipal) maintained by contract. The AWOS was commissioned on December 17, 2000. On May 13, 2001, the AWOS facility maintenance log stated in part: "All systems were found to operate within tolerances." On December 14, 2001, the AWOS barometric pressure sensors were recalibrated, and the AWOS returned to service. The DUC REIL are city owned and maintained. The DUC maintenance summary data for November 6, 1999, through October 21, 2001,

indicated that the REIL was not working and out of service (OTS). During a review of the facility maintenance log from June 1999-through the day of the accident, no LOC discrepancies were recorded. On December 14, 2001, the facility maintenance log stated no corrective action required for the LOC. On December 21, 2001, the following NOTAM was issued: LOC runway 35 radar fix/GYROE intersection radar fix not available until further notice.

WRECKAGE AND IMPACT INFORMATION

The FAA inspector and local authorities, who responded to the accident site, found the wreckage of the airplane approximately 1/2 nautical mile (NM) short of runway 35 in an open field, resting upright on a measured magnetic heading of 270 degrees at a Global Positioning System (GPS) Latitude 34 degrees 27.44 minutes North; Longitude 97 degrees 57.65 minutes West (GPS accuracy plus or minus 16 feet) approximately 276 feet from power line poles. Power line cables were found tangled about the fuselage and the horizontal stabilizer. The wings were found bent, and the fuselage crushed upward. The propeller blades were bend aft on the left engine. On the right engine, one propeller blade was bent aft and twisted, and one blade was bent forward and twisted.

Flight control continuity was confirmed. Both main landing gear were extended and found separated from the airframe. Both fuel selectors were on the main tank, respectively. Fuel was found in each main fuel tank.

The two navigation radios were found set on 111.5 Megahertz (MHz) and between 111.5 and .1 MHz, respectively. The two communication radios were set on 120.55 MHz and 122.8 MHz, respectively. The Global Positioning System (GPS) was found in the "ON" position. The altimeter reading was 1,100 feet, and the Kollsman window at 29.97 inches of Mercury. The manifold pressure gauge was reading 22 inches for the left engine and 28.5 inches for the right engine. The shoulder harness was found separated at the upper attachment point. Approximately 2 cases of oil, a 2 gallon sprayer, and a tow bar were found in the nose baggage compartment. Approach charts were found in the cockpit.

On January 17, 2002, the airplane was examined, under the supervision of the NTSB IIC, at Air Salvage of Dallas (ASOD), Lancaster, Texas. The forward fuselage was found crushed toward the cockpit, and the power quadrant and seat tracks were displaced aft. At ASOD, power was applied to the aircraft and avionics specialist from IEC International, Inc., Fort Worth, Texas, performed test on all the radios and instruments. Approach receivers, indicators, and communication equipment were checked and no anomalies were noted that would have affected the approach.

The left front lap belt was found unfastened, the shoulder belt found fastened to the lap belt, and the shoulder belt inertia reel separated at the bolt of the attachment bracket. The single bolt (NAS-222-15) was separated at the upper thread line. According to the aircraft manufacturer, the "separation appeared typical of tensile overload with peaking noted on both parts near the perimeter."

The rotor and vanes of both vacuum pumps were found intact and no anomalies were found that would have prevented their operation.

During hand rotation of the crankshaft, continuity and thumb compression was obtained on all cylinders for both engines. According to the engine manufacturer's representative, the spark plugs "had an extended service life and the color was consistent with normal combustion. There were no anomalies found for either engine that would have precluded operation prior to the accident.

TEST AND RESEARCH

The Apollo (II Morrow) GPS model GX50, part number 430-6050-400, with Software Level C was examined at UPS Aviation Technologies, Salem, Oregon, under the supervision of the FAA. Flight data position retrieved from the unit: Latitude 34 degrees 27.40 minutes North; Longitude 097 Degrees 57.64 minutes West. During bench testing, the unit acquired a 3D fix, and performed navigation task in less than 3 minutes.

ADDITIONAL INFORMATION

The airplane was released to the owner's representative.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	27,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):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	June 28, 2001
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 16, 2001
Flight Time:	1661 hours (Total, all aircraft), 417 hours (Total, this make and model), 1410 hours (Pilot In Command, all aircraft), 292 hours (Last 90 days, all aircraft), 70 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N127CA
Model/Series:	PA-23-250	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	27-7305125
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	September 28, 2001 100 hour	**Certified Max Gross Wt.:**	5200 lbs
Time Since Last Inspection:	53 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-540-C4B5
Registered Owner:	Delta Sales Company	**Rated Power:**	250 Horsepower
Operator:	Safewing Aviation Company, Inc.	**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	DD5A

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	DUC,1113 ft msl	**Distance from Accident Site:**	
Observation Time:	22:35 Local	**Direction from Accident Site:**	350°
Lowest Cloud Condition:		**Visibility**	0.25 miles
Lowest Ceiling:	Overcast / 100 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	5°C / 5°C
Precipitation and Obscuration:	N/A - None - Fog		
Departure Point:	Oklahoma City, OK (PWA)	**Type of Flight Plan Filed:**	IFR
Destination:	Duncan, OK (DUC)	**Type of Clearance:**	IFR
Departure Time:	21:30 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Duncan/Halliburton Field DUC	**Runway Surface Type:**	Concrete
Airport Elevation:	1113 ft msl	**Runway Surface Condition:**	Wet
Runway Used:	35	**IFR Approach:**	Localizer only
Runway Length/Width:	6650 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	34.457221,-97.96083

Administrative Information

Investigator In Charge (IIC):	Roach, Joyce
Additional Participating Persons:	Robert E Giguere; FAA FSDO; Oklahoma City, OK Michael C McClure; The New Piper Aircraft, Inc.; Vero Beach, FL John Butler; Textron Lycoming; Willaimsport, PA
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Note:	
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