National Transportation Safety Board
Aviation Accident Final Report

Location:	Conway, AR	**Accident Number:**	CHI07FA187
Date & Time:	06/30/2007, 1450 CDT	**Registration:**	N771HR
Aircraft:	Cessna 500	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal, 1 Minor
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The twin-engine turbojet airplane was attempting to land on a runway with standing water when the accident occurred. Before the landing attempt, the pilot was told that the runway was wet from a recent rain shower. Witnesses reported seeing the airplane on the runway traveling at a high speed and then increase engine power to abort the landing with about 1/4 of the runway remaining. The surviving passenger reported that the runway was "soaked and shiny with water." He stated that the airplane landed hard and fishtailed during the landing roll. During the aborted landing the airplane impacted a jet-blast deflector located off the departure end of the runway. The airplane then proceeded through the airport perimeter fence and impacted a residential structure before coming to a stop. The airplane and residential structure were destroyed during a postaccident fire. An examination of the airframe and engines did not reveal any anomalies associated with a preimpact failure or malfunction. The airplane was not equipped with thrust reversers or an anti-skid braking system. Radar track data analysis indicated that when the airplane was about 1/4 mile from the end of the runway it was approximately 16 knots above its target landing reference speed (Vref) and had a descent rate of 1,150 feet per minute. The runway was 4,875 feet long. The calculated landing distance for a runway with standing water is 4,789 feet.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to fly a stabilized approach and his delayed decision to abort the landing. Contributing to the accident was the standing water on the runway.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: LANDING - ABORTED

Findings
1. (C) AIRSPEED(VREF) - EXCEEDED - PILOT IN COMMAND
2. (C) ABORTED LANDING - DELAYED - PILOT IN COMMAND
3. (F) AIRPORT FACILITIES,RUNWAY/LANDING AREA CONDITION - OTHER
4. (F) TERRAIN CONDITION - WET
5. OBJECT - WALL/BARRICADE
6. OBJECT - FENCE
7. OBJECT - RESIDENCE

Occurrence #2: FIRE/EXPLOSION
Phase of Operation: OTHER

Factual Information

HISTORY OF FLIGHT

On June 30, 2007, at 1450 central daylight time (cdt), a 1974 Cessna model 500 (Citation), N771HR, piloted by a commercial pilot, was destroyed during a post-impact fire after colliding with a jet-blast deflector, airport perimeter fence, and residential structure during an aborted landing from runway 26 (4,875 feet by 100 feet, asphalt) at Dennis F. Cantrell Field Airport (KCWS), Conway, Arkansas. Visual meteorological conditions prevailed at the time of the accident. The personal flight was operating under the provisions of 14 Code of Federal Regulations Part 91 while on an instrument flight rules flight plan. The pilot was fatally injured and his passenger sustained minor injuries. An individual located in the residential structure was fatally injured. The flight departed Kickapoo Downtown Airport (T47), Wichita Falls, Texas, at 1337 cdt.

At 1130 cdt, the pilot contacted Lockheed Martin Automated Flight Service Station (AFSS) to file an instrument flight plan and to obtain a weather briefing. The planned route of flight was from T47 direct to the Ardmore VHF Omni-directional Range/Tactical Air Navigation (VORTAC) and then direct KCWS. The planned en route time was 1 hour 15 minutes. The briefer and the pilot then discussed an area of convective rain showers that affected the planned route of flight, the current weather conditions at the departure and destination airports, and the forecasted weather conditions along the route of flight and at the destination airport.

At 1337 cdt, the pilot contacted Fort Worth Air Route Traffic Control Center (ARTCC) after departing from T47. The pilot was cleared to KCWS as previously filed and to climb to 23,000 feet. At 1345 cdt, the pilot was cleared to 27,000 feet. At 1402 cdt, the pilot was rerouted to fly direct to the McAlester VORTAC and then direct KCWS to avoid an area of adverse weather. At 1411 cdt, the controller told the pilot of an area of moderate to heavy precipitation to the east of the airplane's position and that the planned route of flight would pass between two precipitation cells.

At 1412 cdt, the pilot contacted Memphis ARTCC and was subsequently cleared to descend at pilot's discretion to 24,000 feet. The pilot acknowledged the descent clearance and requested to deviate to the right to avoid some weather. At 1425 cdt, the pilot was cleared to descend to 17,000 feet and was issued the current altimeter setting for the Adams Field Airport (KLIT), Little Rock, Arkansas. At 1430 cdt, the pilot was cleared to descend to 5,000 feet.

At 1438 cdt, the pilot contacted Little Rock Approach Control and was told to expect a visual approach into KCWS. At 1439 cdt, the pilot was cleared to descend to 3,000 feet and was told to report when he had the airport in sight. At 1444 cdt, the pilot advised that KCWS was 6 miles at his 12 o'clock position. The controller cleared the flight for a visual approach into KCWS and told the pilot to cancel his flight plan either in the air or when on the ground. There were no additional communications between the pilot and air traffic control.

A witness to the accident was working at the fixed base operator (FBO) located on the airport. He responded to the pilot's radio call for an airport advisory on the CTAF. He told the pilot that the winds were out of the west between 5 and 10 knots, surface visibility was 10 miles, and that the runway was wet from a recent rain shower. The witness did not see where the airplane touched down on the runway. He reported that the airplane "did not slow enough to stop" and

then "added power at the last second, lifted the nose wheel off the ground, and struck the [jet-blast deflector]" located at the end of runway. He stated that there was a "big ball of orange flames and black smoke" upon impact with the residential structure located off the end of the runway.

Another witness reported seeing the airplane on the runway surface approximately midfield traveling at a high rate of speed. The witness remarked that the airplane was traveling too fast in order to stop before the end of the runway. The witness then heard the airplane's engines increase in power with about 1/4 of the runway remaining. He stated that both wing flaps were extended and the nose landing gear was still on the runway. Shortly after the increase in engine power, the airplane impacted the jet-blast deflector and then the residential structure.

The passenger stated that he was seated on the bench seat located on the right side of the airplane. He said that the takeoff, cruise, and descent flight phases were uneventful. He noted that the pilot was aware of a rain storm that passed over the Conway area and that he "wasted a little bit of time" to let the storm pass-by. During landing he was looking out the windows on the left side of the airplane. He noted that the runway was "soaked and shiny with water." The airplane landed with a "hard bump" and then proceeded to "fishtail" from left to right. He recalled seeing "a lot of runway pass-by" and thinking to himself that "we've gone too far." He thought the airplane must have been equipped with thrust-reversers, because he heard the sound of the engines increase while having the sensation that the airplane was still braking. He then heard the engines increase power even more before the airplane lifted off the runway and struck the jet-blast deflector. After coming to rest, he was unable to open the cabin door using the inside latch handle and resorted to kicking the door open. After getting the door open, he attempted to get the pilot out of the airplane but was unable due to the intense heat and flames.

PERSONNEL INFORMATION

According to Federal Aviation Administration (FAA) records, the pilot of N771HR, age 72, held a commercial pilot certificate with airplane single and multiengine land, and instrument airplane ratings. The airplane single engine land rating was limited to private pilot privileges. He was type-rated for the Cessna model 500 airplane. The pilot's last aviation medical examination was completed on July 25, 2006, when he was issued a second-class medical certificate with the limitation that he wear corrective lenses for distance vision and possess glasses for near vision.

The pilot's flight logbook was not recovered during the investigation. When applying for his previous medical certificates, he reported his total flight experience and flight time completed within the past six months. As of July 25, 2006, he had 5,575 hours total flight experience and had flown 30 hours during the prior six months. Between July 18, 2005 and July 25, 2006, he accumulated 75 flight hours. Between April 16, 1996 and July 25, 2006, he accumulated 925 flight hours, for an overall average of about 90 flight hours per year.

A search of FAA records showed no previous accidents or enforcement actions. However, FAA records did reveal a March 15, 2007, incident where he was the pilot-in-command of an airplane that departed off the right edge of runway 26 while landing at KCWS. The airplane, N771HR, was not damaged and the pilot, the sole occupant, was not injured. Reportedly, the left main landing gear brake system was ineffective upon landing and had to be replaced before the airplane was returned to service.

AIRCRAFT INFORMATION

The 1974 Cessna model 500 (Citation), serial number 500-0206, was a twin-engine business turbojet airplane. The airplane was configured to seat two flight crew and seven passengers. The transport category airplane was originally issued a standard airworthiness certificate on November 18, 1974. The airplane was powered with two Pratt & Whitney Canada JT-15D-1A turbofan engines, serial numbers 76448 and 76469, each capable of producing 2,200 pounds of thrust. The airplane was maintained on a manufacturer approved inspection program (AAIP) and its most recent airframe inspection was completed on July 11, 2006, at a total service time of 4,752.6 hours. The last airframe maintenance was performed on May 1, 2006, at an airframe total service time of 4,811.1 hours. The left and right engines had accumulated 4,611.1 and 4,695.1 hours, respectively.

The aircraft's type-certificate data sheet listed a maximum takeoff weight of 11,500 pounds and a maximum landing weight of 11,000 pounds. According to the most recent weight and balance record, the aircraft empty weight was 6,982.65 pounds with a center-of-gravity location of 262.09 inches aft of datum.

The airplane had been modified with wing extensions by Supplemental Type Certificate No. SA2172NM. The wing extension modification allowed for a single-pilot operation. The airplane was not equipped with thrust reversers or an anti-skid braking system. The airplane was equipped with a wheel skid warning system. The airplane fuel system was modified by Cessna Service Bulletin No. 500-28-10, which increased the total fuel capacity to 581.6 gallons, 544 gallons usable.

The airplane was fueled with 320 gallons of Jet-A fuel before the accident flight. According to the refueling personnel, both wing tanks were filled to the bottom of the yellow metal tab adjacent to the filler neck, or about 4 inches from the top of the tank.

METEOROLOGICAL INFORMATION

The closest aviation weather reporting facility was located at Little Rock Air Force Base (KLRF), about 17 nm southeast of the accident site. The Air Force Base was equipped with an automated surface observing system (ASOS). At 1455 cdt, the KLRF ASOS reported the following weather conditions: Wind 130 degrees true at 6 knots; surface visibility 10 miles; few clouds at 4,900 feet above ground level (agl); temperature 33 degrees Celsius; dew point 21 degrees Celsius; altimeter setting 29.97 inches of mercury. The weather report indicated that there was lightning in the distant north.

The closest non-aviation weather station was located in Wooster, Arkansas, about 7 nm north of the accident site. The weather station, identification number C5288, was part of the Citizen Weather Observation Program (CWOP) network. At 1947 cdt, the C5288 station reported the following weather conditions: Wind 2-3 knots from the east; temperature 24 degrees Celsius; dew point 22 degrees Celsius; altimeter setting 29.93 inches of mercury.

A witness to the accident was working at the FBO located at KCWS. He responded to the pilot's radio call for an airport advisory on the CTAF. He told the pilot that the winds were out of the west between 5 and 10 knots, surface visibility was 10 miles, and that the runway was wet from a recent rain shower.

A National Oceanic and Atmospheric Administration (NOAA) wind model was generated for the accident airport. The 1300 cdt model indicated that the winds at the surface to about 900 feet agl were approximately 1 knot from the northwest. The winds were 3-4 knots from the southeast between 1,600 feet agl and 2,400 feet agl.

AIRPORT INFORMATION

The Dennis F. Cantrell Field Airport (KCWS) was located on the southeast side of Conway, Arkansas. The airport had two runways: 8/26 (4,875 feet by 100 feet, asphalt) and 18/36 (3,278 feet by 60 feet, asphalt). The general airport elevation was listed as 315 feet msl.

Runway 26 was marked with a displaced threshold measuring 1,643 feet from the runway approach end. The displaced threshold was only applicable for nighttime operations, according to the airport facility directory. The full length of runway 26 was available during daytime operations. There was a 10-foot tall jet-blast deflector and 4-foot tall chain-link airport perimeter fence located 120 feet and 130 feet off the departure end of runway 26, respectively.

FLIGHT RECORDERS

The accident airplane was not equipped, nor was it required to be equipped, with a cockpit voice recorder or flight data recorder.

WRECKAGE AND IMPACT INFORMATION

The airplane overran the end of runway 26 before impacting a jet-blast deflector, airport perimeter fence, and residential structure. At the departure end of the runway there was a 10-foot long linear scrape in the runway surface. The scrape was consistent with a tail strike and was oriented along the accident airplane's direction of travel. An approximately 10-foot long section of the jet-blast deflector was bent backward. The damaged jet-blast deflector panel had a lateral semicircular depression along its span about 7 feet agl. The depression was consistent with the size and shape of the leading edge of a Cessna model 500 wing.

The wreckage path continued through the 4-foot tall airport perimeter fence, across Ingram Street, onto a residential driveway. The entire left wing was found conjoined with a 96-foot long portion of the airport perimeter fence at the intersection Ingram Street and the residential driveway. The main wreckage consisted of the remaining airframe structural components and both engines. A majority of the main wreckage and residential structure were destroyed during the post-impact fire.

The fuselage cockpit and cabin areas were destroyed by fire. The nose and main landing gear were in an extended position. The right main landing gear had a portion of the airport perimeter fence wrapped around its associated components. A majority of both main landing gear brake systems were destroyed during the post-impact fire. An inspection of the remaining brake system components did not reveal any anomalies. All of the primary and secondary flight control surfaces were accounted for at the accident site. All of the flight control surfaces exhibited damage consistent with impact and fire. The flaps were extended between 15 and 40 degrees, according to measurements taken of the flap drive system.

Both engines were found attached to their corresponding airframe nacelle structures, and exhibited impact and fire damage. An external examination of both engines was performed on-site. Both low pressure fan shrouds displayed circumferential rubbing and scoring, consistent with radial contact with the fan blades. Both low pressure fans exhibited airfoil deformation opposite the direction of rotation, consistent with radial contact with their respective shrouds and the ingestion of debris. Both high pressure compressor impeller shrouds exhibited circumferential rubbing, consistent with contact with the impeller vanes. Both second stage low-pressure turbines remained intact and had no apparent airfoil damage.

Examination of the airframe and engines did not reveal any anomalies associated with a pre-impact failure or malfunction.

MEDICAL AND PATHOLOGICAL INFORMATION

On July 2, 2007, an autopsy was performed on the pilot at the Arkansas State Crime Laboratory in Little Rock, Arkansas. The pilot's cause of death was attributed to blunt force injuries and thermal burns.

The FAA's Civil Aeromedical Institute in Oklahoma City, Oklahoma, performed toxicology tests on the pilot. No carbon monoxide or cyanide was detected in blood and no ethanol was detected in vitreous. Triamterene was present in blood and urine. Triamterene is a potassium-sparing diuretic commonly used for the treatment of hypertension and edema.

FIRE

The City of Conway Fire Department was notified of the accident at 1451 cdt and was on-site within six minutes. Upon arrival, the airplane and residential structure were fully engulfed in flames and the rescue of the occupants was not attempted due to extreme heat, flames, and smoke. The fire was contained to the residential property, but as a precaution the surrounding residents were evacuated away from the accident site. The fire department subsequently extinguished all of the fires on the property.

TESTS AND RESEARCH

The approach speed, reference landing speed (Vref), and landing distance were interpolated using performance tables and charts included in the Cessna model 500 flight manual and its related supplements. The landing weight was estimated to be 9,625 pounds. The approach and Vref speeds were 106 and 104 knots, respectively. The landing distance for a dry, paved runway was calculated to be 2,177 feet.

According to the Cessna model 500 flight manual, the dry landing distance is increased by a factor of 1.45 if the runway is contaminated with less than 0.01-inch of water (wet). If the runway is contaminated with 0.01-0.50 inch of water (water contaminated) the dry runway landing distance is increased by a factor of 2.20. The resulting landing distances for a wet or water contaminated runway were 3,157 feet and 4,789 feet, respectively.

Aircraft radar track data was reviewed to determine the landing speed and descent rate during the landing approach. The plotted radar data showed the airplane approaching the airport from the west and entering an approximately 1.5 mile wide left downwind for runway 26. The airplane then made a continuous left turn from downwind to the final approach. The turn began at 1,250 feet msl, or approximately 935 feet agl. The calculated calibrated airspeed decreased from 116 knots to 105 knots during the first half of the turn to final approach. During the second half of the turn the calibrated airspeed and descent rate began to increase. The final radar return was recorded approximately 1/4 mile from the approach end of runway 26 on the extended runway centerline. The altitude of the last radar return was at 600 feet msl, or approximately 285 feet agl. The calculated calibrated airspeed and descent rate at the last radar return were 120 knots and 1,150 feet per minute, respectively.

Pilot Information

Certificate:	Commercial	**Age:**	72, Male
Airplane Rating(s):	Multi-engine Land; Single-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 With Waivers/Limitations	**Last Medical Exam:**	07/25/2006
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	5575 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Cessna	**Registration:**	N771HR
Model/Series:	500	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Transport	**Serial Number:**	500-0206
Landing Gear Type:	Retractable - Tricycle	**Seats:**	9
Date/Type of Last Inspection:	07/11/2006, AAIP	**Certified Max Gross Wt.:**	11500 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo Fan
Airframe Total Time:	4752.6 Hours	**Engine Manufacturer:**	Pratt & Whitney Canada
ELT:		**Engine Model/Series:**	JT-15D-1A
Registered Owner:	IHR Adminstrative Services, Inc.	**Rated Power:**	2200 lbs
Operator:	IHR Adminstrative Services, Inc.	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	KLRF, 311 ft msl	**Observation Time:**	1455 CDT
Distance from Accident Site:	17 Nautical Miles	**Direction from Accident Site:**	124°
Lowest Cloud Condition:	Few / 4900 ft agl	**Temperature/Dew Point:**	33°C / 21°C
Lowest Ceiling:	None	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	6 knots, 130°	**Visibility (RVR):**	
Altimeter Setting:	29.97 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Wichita Falls, TX (T47)	**Type of Flight Plan Filed:**	IFR
Destination:	Conway, AR (KCWS)	**Type of Clearance:**	IFR
Departure Time:	1337 CDT	**Type of Airspace:**	Class G

Airport Information

Airport:	Dennis F. Cantrell Field Arpt (KCWS)	**Runway Surface Type:**	Asphalt
Airport Elevation:	315 ft	**Runway Surface Condition:**	Standing Water; Wet
Runway Used:	26	**IFR Approach:**	Visual
Runway Length/Width:	4875 ft / 100 ft	**VFR Approach/Landing:**	Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Minor	**Aircraft Fire:**	On-Ground
Ground Injuries:	1 Fatal	**Aircraft Explosion:**	On-Ground
Total Injuries:	2 Fatal, 1 Minor	**Latitude, Longitude:**	35.081389, -92.433056

Administrative Information

Investigator In Charge (IIC):	Andrew T Fox	**Adopted Date:**	09/10/2009
Additional Participating Persons:	Wesley D Crook; Federal Aviation Administration - Little Rock FSDO; Little Rock, AR Seth D Buttner; Cessna Aircraft Company; Wichita, KS Thomas Berthe; Pratt & Whitney Canada; South Burlington, VT		
Publish Date:	09/10/2009		
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/.		

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.