National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB ID: ERA09LA339	Aircraft Registration Number: N877AF
Occurrence Date: 06/12/2009	Most Critical Injury: None
Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone	
Bridgeport	CT	06615	0756	EDT	

Airport Proximity: On Airport/Airstrip

Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
PILATUS AIRCRAFT LTD	PC-12/47	Airplane

Revenue Sightseeing Flight: No

Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

HISTORY OF FLIGHT

On June 12, 2009 at 0756 eastern daylight time, a Pilatus PC-12/47 airplane, N877AF, was substantially damaged when it impacted a blast fence during landing at Igor I. Sikorsky Memorial Airport (BDR), Bridgeport, Connecticut. The two pilots and five passengers were not injured. Instrument meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was filed for the flight that originated at Norwood Memorial Airport (OWD), Norwood, Massachusetts, at 0711. The aircraft was fractionally owned by private individuals who delegated the management of the airplane to Alpha Flying, Inc. The fractional ownership flight was conducted under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91, Subpart K.

According to the pilots, they checked the weather prior to departure from OWD and determined they would not be able to fly to their original destination of White Plains, New York. The captain discussed the weather with the operator and they decided to amend their destination to BDR. The pilots reported that at the time of their departure, the recorded weather at BDR included an overcast ceiling of 700 feet above ground level (agl) with 7 miles visibility and light rain.

When they arrived in the Bridgeport area, the pilots conducted the VOR (very-high frequency omnidirectional radio range) 24 approach "to minimums." When they were not able to visually acquire the runway environment at the missed approach point, they conducted a missed approach. The pilots then received "vectors to final" for the ILS (instrument landing system) 6 approach. The captain flew the approach with the autopilot engaged, and as the airplane reached the minimum decision altitude of 307 feet msl (300 feet agl), the co-pilot visually acquired the runway lights and the captain disconnected the autopilot and continued the descent. As the airplane descended to an altitude of approximately 200 feet, the pilots visually acquired the runway and the captain decreased the power and called for "flaps 30."

Both pilots stated they knew they were "landing long;" however, they had "plenty of runway" in front of them to safely touch down and stop on the runway. The captain estimated the airplane touched down about halfway down the 4,677-foot-long runway, and she immediately applied "max reverse" thrust, and "more than average braking." The airplane initially began to slow, and then "started hydroplaning" on the wet runway. The pilots observed a fence at the end of the runway, and decided they would not be able to perform a go-around. The airplane continued to skid on the runway and impacted the fence before coming to a stop.

The pilots completed an "emergency shut down," and assisted the passengers in evacuating out the main cabin door.

Both pilots stated they did not perform any landing distance calculations prior to or during the flight. They also reported no mechanical deficiencies with the airplane or engine.

Narrative (Continued)

Several witnesses observed the airplane land on runway 6. One witness reported the airplane "appeared to be floating in ground effect" before touching down near the intersection of runway 11/29, "at a high rate of speed." Another witnesses observed the airplane at a height of approximately 15 feet, as it passed the intersection of runway 11/29. A third witness reported the airplane "touched down fast" near the runway intersection, "followed by an aggressive reverse and sound of impact." The witness thought the cloud ceiling was indefinite at 100 feet agl, and the visibility was 1 mile in fog and mist.

According to statements from the passengers, they felt the airplane "hydroplane" after landing and then swerve before striking the fence. One passenger reported the airplane "took a long time to touchdown." He also stated he observed the ground lights when the airplane was about 200-300 feet above the ground.

An airport surveillance camera captured the airplane landing on runway 6. The camera was affixed to a fixed base operator on the North Ramp, along taxiway Delta, and was oriented toward the departure end of runway 6. Examination of the recorded surveillance video revealed the airplane had not touched down as it passed the touchdown zone markings for runway 24. The touchdown zone markings were 1,000 feet from the end of the runway.

PILOT INFORMATION

The captain, age 27, held a commercial pilot certificate with ratings for airplane single and multi-engine land and instrument airplane. She also held a flight instructor certificate with ratings for airplane single and multi-engine land and instrument airplane. Her most recent Federal Aviation Administration (FAA) second-class medical was issued on October 22, 2008. At that time, she reported 2,700 total hours of flight experience.

According to records provided by the operator, as of the date of the accident, the captain had accumulated 2,840 hours of total flight experience, 660 of which were in the make and model of the accident airplane. She accumulated 70 hours of actual instrument experience and 90 hours of simulated instrument experience.

The captain satisfactorily completed initial training in the airplane on October 24, 2007, and upgraded to captain on May 30, 2008. Her most recent instrument proficiency check (IPC) was completed on October 14, 2008, with an "average" rating, and her most recent annual check was completed on June 8, 2009 also with an "average" rating.

The co-pilot, age 43, held a commercial pilot certificate with ratings for airplane single and multi-engine land and instrument airplane. He also held a flight instructor certificate with ratings for airplane single engine land and instrument airplane. His most recent FAA second-class medical was issued on January 15, 2009. At that time, he reported 4,000 hours of total flight experience.

According to records provided by the operator, the co-pilot had accumulated 3,613 total hours of flight experience, 2,108 of which were in the make and model of the accident airplane. He accumulated 377 hours of actual instrument experience and 102 hours of simulated instrument experience.

The co-pilot completed his initial training in the airplane in April 2004. His most recent IPC was completed on October 14, 2008 with an "average" rating, and his most recent annual check was completed on May 26, 2009, also with an "average" rating.

AIRCRAFT INFORMATION

Narrative (Continued)

The Pilatus PC-12 was a single-engine turboprop airplane powered by a Pratt & Whitney PT6A engine.

The most recent inspection performed on the airplane was a 100-hour inspection, completed on April 21, 2009.

At the time of the accident, the airplane had accumulated 983 total flight hours.

According to the Pilatus PC-12 Airplane Flight Manual, the prescribed landing configuration required using 40 degrees of flaps. In that configuration, the required landing distance for the airplane was 2,013 feet. Without reverse thrust, the airplane required approximately 2,404 feet of landing distance on a dry runway.

In a configuration of 30 degrees of flaps, and no reverse thrust, the airplane required 2,933 feet of landing distance.

There was no landing distance calculation for a wet runway.

METEOROLOGICAL INFORMATION

The BDR 0752 weather observation, included wind from 260 degrees at 5 knots, 2 miles visibility with light rain and mist, overcast clouds at 300 feet agl, temperature 17 degrees C, dew point 17 degrees C, and altimeter setting of 29.70 inches mercury.

At 0552, the recorded visibility was 7 miles with an overcast cloud ceiling of 700 feet.

At 0652, the recorded visibility was 3 miles with light rain and mist. An overcast cloud ceiling was reported at 700 feet, variable between 400 and 800 feet.

The 0753 weather observation at Tweed-New Haven (HVN), New Haven, Connecticut, 13 miles to the northeast, included calm winds, 1/2 mile visibility, light rain, fog, and a cloud ceiling of 200 feet.

The recorded weather at Waterbury-Oxford Airport(OXC), Waterbury, Connecticut, at 0745, included wind from 200 degrees at 4 knots, 1/8 mile visibility in fog, and indefinite ceiling 200 feet.

The terminal forecast for the Bridgeport area, issued at 0325, predicted 1 mile visibility in mist and an overcast cloud layer at 300 feet beginning at 0500. After 1000, the forecast predicted 5 miles visibility with light rain showers and mist, with an overcast cloud layer at 1,500 feet.

A review of the Notice to Airmen (NOTAM) database revealed there were no NOTAMs issued for the day of the accident regarding the wet runway.

AIRPORT INFORMATION

BDR was publicly-owned by the City of Bridgeport, located in the town of Stratford, Connecticut. The airport was comprised of two intersecting runways, oriented in an 11/29 and 6/24 configuration. The airport had 7 instrument approaches to 3 of the 4 runways.

The inbound course for the ILS Runway 6 approach was 060 degrees magnetic, and the glideslope crossing altitude was 1,687 feet msl. The decision altitude was 307 feet msl and the touchdown zone elevation was 7 feet. The visibility requirement for the approach was 1 mile.

The ILS Runway 6 Approach was flight checked after the accident, during which no anomalies were noted.

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Occurrence Type: Accident

Narrative (Continued)

Runway 6 at BDR was a 4,677-foot long, 150-foot wide, hard surfaced asphalt runway. The usable length of the runway when landing at the glideslope intercept point was 3,686 feet. No safety area existed at the end of runway 6. Runway 24 had a displaced threshold that extended 320 feet from the beginning of the runway.

The distance from the intersection of runway 6 and runway 11 to the departure end of runway 6 was 877 feet.

Blast Fence

An 8-foot 9-inch-high, nonfrangible metal blast fence was located about 342 feet prior to the runway 24 displaced threshold. The fence was installed to protect Connecticut State Highway 113, a public road that ran parallel to the fence, from jet/propeller blast of aircraft operating at the airport. The highway was located about 10 feet beyond the blast fence. The blast fence was constructed with galvanized structural grade steel upright sections and double reverse galvanized corrugated sheet metal.

WRECKAGE INFORMATION

The airplane was examined by representatives of the airframe and engine manufacturers, under the supervision of an FAA inspector. Examination of the airplane revealed substantial damage to the left wing spar, left wing leading edge, and aileron. The flaps were confirmed in the 30-degree position and testing of the flight control and braking systems revealed no anomalies. The engine displayed signatures of full power with the propeller in full reverse mode, at the time of impact. No pre-impact anomalies were noted with the airplane or engine.

ADDITIONAL INFORMATION

According to the Aeronautical Information Manual Pilot/Controller Glossary, a contaminated runway, "is considered contaminated whenever standing water, ice, snow, slush, frost in any form, heavy rubber or other substances are present."

According to an FAA Accident Prevention Program Publication, On Landings Part II, FAA-P-8740-49, Water on the Runway and Dynamic Hydroplaning:

"Spring, summer, winter or fall, anytime is time for water on the runway. When the runway's wet you may be confronted with dynamic hydroplaning. Dynamic hydroplaning is a condition in which the airplane rides on a sheet of water rather than on the runway's surface. Because hydroplaning wheels are not touching the runway, braking and directional control are almost nil. You are literally 'surfing'."

"There are actually three types of hydroplaning, Dynamic - where the airplane rides on standing water; Viscous - where a film of moisture covers the painted or rubber coated portion of the runway; and Reverted, or melted rubber - where locked tires on a wet runway can cause heat so intense that the aircraft is actually riding on a mixture of steam and melted rubber. For now, we'll concentrate only on dynamic hydroplaning. To help minimize dynamic hydroplaning, some runways are grooved to help drain off water. But most runways are not. Tire pressure is a factor in dynamic hydroplaning. By this simple formula you can calculate the minimum speed, in knots, at which hydroplaning will begin. In plain language, the minimum hydroplaning speed is determined by multiplying the square root of the main gear tire pressure, in PSI, by nine."

"Landing at higher than recommended touchdown speeds will expose you to a greater potential for hydroplaning. And once hydroplaning starts, it can continue well below the minimum, initial hydroplaning speed. When the runway is wet, be prepared for hydroplaning and opt for a suitable runway most aligned with the wind. Landing into the wind gives you the best chance for directional

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Narrative (Continued)

control - but don't count on it. If you hydroplane, make no abrupt control movements. Your brakes will be completely useless - so don't use them. Use aerodynamic braking to your fullest advantage. In summary, think about runway braking problems well before you land."

Previously issued Safety Recommendations

On April 27, 1994, a Piper PA-31-350 airplane, N990RA, struck the blast fence during landing rollout on runway 6 at BDR. The impact with the fence and resultant post-crash fire killed 8 of the 9 occupants on board the airplane.

As a result of the accident, the Safety Board issued 4 recommendations to the FAA, the Connecticut Department of Transportation, the City of Bridgeport, and the Town of Stratford recommending the removal of the non-frangible blast fence and assuring an adequate runway safety area at the end of runway 6. These recommendations are as follows:

NTSB Recommendation A-94-211: To the FAA: Inspect all Title 14 Code of Federal Regulations Part 139 certificated airports for adequate runway safety areas and non-frangible objects, such as blast fences, and require that substandard runway safety areas be upgraded to Advisory Circular 150/5300-13 minimum standards wherever it is feasible.

NTSB Recommendation A-94-213: To the Connecticut Department of Transportation: In coordination with the City of Bridgeport, the Town of Stratford, and Sikorsky Memorial Airport, relocate state highway 113 away from the runway 24 threshold to provide adequate distance between airplanes and highway 113 to protect vehicles and persons from jet blast.

NTSB Recommendation A-94-214: To the City of Bridgeport, Connecticut: In coordination with the State of Connecticut and the Town of Stratford, following the relocation of state highway 113, Sikorsky Memorial Airport should immediately establish a runway safety area at the approach end of runway 24 in accordance with Federal Aviation Administration Advisory Circular 150/5300-13 and remove the nonfrangible blast fence.

NTSB Recommendation A-94-216: To the Town of Stratford, Connecticut: In coordination with the State of Connecticut and the City of Bridgeport, following the relocation of state highway 113, Sikorsky Memorial Airport should immediately establish a runway safety area at the approach end of runway 24 in accordance with Federal Aviation Administration Advisory Circular 150/5300-13 and remove the nonfrangible blast fence.

Additional Accidents

Following the 1994 accident, the Safety Board investigated one additional accident involving an aircraft impacting the non-frangible blast fence at the end of runway 6 (not including the subject Pilatus accident on June 12, 2009). The accident summary is as follows:

NYC01FA084 - On March 9, 2001, about 1301 eastern standard time, a Hawker Siddeley HS-125-3A, N48DD, was substantially damaged when it overran runway 6 and impacted the non-frangible blast fence. The two certificated airline transport pilots were not injured. Instrument meteorological conditions prevailed and an instrument flight rules flight plan was filed for the positioning flight that originated from the Bradley International Airport, Windsor Locks, Connecticut, about 1230. The flight was conducted under 14 CFR Part 91.
The NTSB determined the probable cause of the accident was: “the pilot-in-command’s inadequate preflight planning resulting in an approach to a runway with insufficient length.” The damage to the airplane was directly attributable to the impact with the nonfrangible blast fence.
Updated on Aug 20 2010 2:55PM

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Occurrence Date: 06/12/2009

Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
Igor Sikorsky Memorial Airport	BDR	9 Ft. MSL	06	4677	150

Runway Surface Type: Asphalt

Runway Surface Condition: Wet

Approach/Arrival Flown: ILS

VFR Approach/Landing: Full Stop

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
PILATUS AIRCRAFT LTD	PC-12/47	877

Airworthiness Certificate(s): Normal

Landing Gear Type: Retractable - Tricycle

Amateur Built Acft?	Number of Seats:	Certified Max Gross Wt.	Number of Engines:
No	8	10450 LBS	1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Turbo Prop	P&W CANADA	PT6A-67D	1279 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
100 Hour	04/2009	Hours	983 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type	ELT Operated?	ELT Aided in Locating Accident Site?
Yes /	No	No

Owner/Operator Information

Registered Aircraft Owner	Street Address	City	State	Zip Code
DIFLY INC plus nine other fractional owners	115 FLIGHT LINE RD	PORTSMOUTH	NH	03801-6811

Operator of Aircraft	Street Address	City	State	Zip Code
Alpha Flying Inc.	115 Flightline Road	Portsmouth	NH	03801

Operator Does Business As:

Operator Designator Code:

- Type of U.S. Certificate(s) Held:

Air Carrier Operating Certificate(s): Fractional Ownership

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 91 Subpart K: Fractional

Type of Flight Operation Conducted: Executive/Corporate;Non-scheduled; Domestic; Passenger Only

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Occurrence Date: 06/12/2009

Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	27

Sex: F | Seat Occupied: Left | Occupational Pilot? Yes | Certificate Number: On File

Certificate(s): Flight Instructor; Commercial

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA:

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Multi-engine; Airplane Single-engine; Instrument Airplane

Current Biennial Flight Review? 06/2009

Medical Cert.: Class 2 | Medical Cert. Status: Without Waivers/Limitations | Date of Last Medical Exam: 10/2008

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	2840	660	2770	75	180	70	90			
Pilot In Command(PIC)	2600	500	2300	65	170	70	90			
Instructor	1700	0	1650	50	100	5				
Instruction Received					75	60	3			
Last 90 Days	67	67	67	0	2	7	1			
Last 30 Days	25	25	25	0	1	6	1			
Last 24 Hours	3	3	3	0	0	2	0			

Seatbelt Used? Yes | Shoulder Harness Used? Yes | Toxicology Performed? No | Second Pilot? Yes

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Norwood	MA	OWD	0711	EDT

Destination	State	Airport Identifier
Same as Accident/Incident Location		BDR

Type of Clearance: IFR

Type of Airspace:

Weather Information

Source of Wx Information:

Automated Report; Commercial Weather Service; Internet

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NTSB ID: ERA09LA339

Occurrence Date: 06/12/2009

Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
BDR	0752	EDT	9 Ft. MSL	NM	Deg. Mag.

Sky/Lowest Cloud Condition: Ft. AGL | Condition of Light: Day

Lowest Ceiling: Overcast 300 Ft. AGL | Visibility: 2 SM | Altimeter: 29.70 "Hg

Temperature: 17 °C | Dew Point: 17 °C | Weather Conditions at Accident Site: Instrument Conditions

Wind Direction: 260 | Wind Speed: 5 | Wind Gusts:

Visibility (RVR): Ft. | Visibility (RVV) SM

Precip and/or Obscuration:

Accident Information

Aircraft Damage: Substantial | Aircraft Fire: None | Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers				5	5
- TOTAL ABOARD -				7	7
Other Ground					
- GRAND TOTAL -				7	7

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NTSB ID: ERA09LA339

Occurrence Date: 06/12/2009

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

Jill M. Andrews

Additional Persons Participating in This Accident/Incident Investigation:

Max Schmitter
FAA/FSDO
Windsor Locks, CT

Bob Renshaw
Pilatus Business Aircraft Ltd.
Broomfield, CO

Robert Fregeau
Pratt & Whitney Engines
Granby, CT

Todd Smith
Atlas/Alpha Flying Service
Portsmouth, NH