Aviation Investigation Final Report

Location:	Forest Hill, Maryland	**Accident Number:**	NYC03FA180
Date & Time:	August 24, 2003, 11:15 Local	**Registration:**	N298RD
Aircraft:	Aero Vodochody L-39ZO	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Several witnesses observed the airplane approach the airpark, proceed over the runway low level, and initiate a go-around. During the go-around, the airplane pitched upwards and began to lose velocity. At the peak of the airplane's accent, the airplane stalled, nosed over, and descended towards the ground. The airplane impacted the southwest corner of a 3-story residential home, located about 1/2-mile west of the airpark, and subsequently impacted the ground, where a post crash fire ensued. Examination of the engine's fuel control revealed that the throttle arm was in the full power position. Examination of the cockpit area revealed that the engine tachometer needles were observed at "28 percent" for N1, and "56 percent" for N2. The fuel pressure needle was observed at its normal pressure reading for a high power setting, and the oil pressure needle and oil temperature gages were observed at a position consistent with the engine developing power. According to the airplanes Flight Training manual, the time required for the engine to accelerate from a low engine speed to high engine speed (idle to max power), was approximately 9 to 12 seconds. The pilot had accumulated about 25 hours of total flight experience in the L-39. The pilot had been informed in the past by the manager of the airplane to maintain 75 percent rpm or better while landing, in the event that a go-around had to be executed. The manager accentuated to the pilot that he needed to be aware that the engine took close to 12 seconds to spool up, and having the extra power lessened the engines response time in the event of a go-around. No pre-impact abnormalities with the airframe or powerplant were observed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's in-flight decision to delay application of engine power to account for the engine's slow response to throttle input, which resulted in an inadvertent stall and subsequent collision

with a residential area. A factor related to the accident was the pilot's lack of experience in jet-powered airplanes.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: GO-AROUND (VFR)

Findings
1. (C) IN-FLIGHT PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
2. (F) LACK OF TOTAL EXPERIENCE IN KIND OF AIRCRAFT - PILOT IN COMMAND
3. AIRSPEED - INADEQUATE - PILOT IN COMMAND
4. STALL - INADVERTENT - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT - UNCONTROLLED

Findings
5. OBJECT - RESIDENCE

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

Findings
6. TERRAIN CONDITION - RESIDENTIAL AREA

Factual Information

HISTORY OF FLIGHT

On August 24, 2003, at 1115 eastern daylight time, an Aero Vodochody L-39ZO, N298RD, was destroyed when it impacted a residential area, while maneuvering in the vicinity of the Forest Hill Industrial Airpark (MD31), Forest Hill, Maryland. The airline transport pilot was fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the flight that originated from the Martin State Airport (MTN), Baltimore, Maryland. The personal flight was conducted under 14 CFR Part 91.

Several witnesses, located within 1/4-mile of the accident site, observed the airplane maneuvering in the vicinity of the airpark prior to the accident.

One witness stated that the airplane conducted a flyby for an open house at the airpark. After passing over the runway, the airplane ascended and then "dropped out of the sky."

A second witness, who was mowing his lawn, observed the airplane as it approached the airpark from the east, "at a typical landing height." As the airplane passed over the witnesses, he recalled the airplane was traveling fast and the landing gear was retracted. The airplane continued towards the airpark and descended below a tree line. The witness thought the airplane was going to crash, when it rose back above the tree line, almost at a takeoff angle. The airplane then seemed to lose velocity, and the nose rose further upward. At the peak of the airplane's accent, about 500-1,000 feet above the ground, it gently rolled over and began to descend towards the ground, with the engine roaring. The airplane continued the nose down descent and disappeared below a tree line.

A third witness observed the airplane conducting a low pass over the airpark. After the pass, the airplane ascended and began to turn. During the turn, the nose of the airplane dropped. The nose then raised, and the airplane "went into an almost flat stall," before descending towards the ground and out of the witness's sight.

A fourth witness stated that the airplane flew over the airpark at a low altitude, and began a climb. The airplane then started to "bank a little from side to side," and went into a nosedive towards the ground.

The airplane impacted the southwest corner of a 3-story residential home, located about 1/2-mile west of the airpark, and subsequently impacted the ground, where a post crash fire ensued.

The accident occurred during the hours of daylight, at 39 degrees, 35.06 minutes north

longitude, 076 degrees, 23.29 minutes west latitude, at an elevation of 574 feet.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with ratings for multi-engine land and single-engine land airplanes. The pilot was also instrument rated. His most recent application for a Federal aviation Administration (FAA) second-class medical certificate was dated on August 16, 2002.

The pilot reported that he had accumulated about 6,950 hours of total flight experience on his application for flight insurance dated April 29, 2002. Attempts to obtain the pilot's flight logbook were unsuccessful.

On May 15, 2002, the pilot applied for, and was granted, a letter of authorization (LOA), to act as pilot-in-command in the L-39.

According the manager of the airplane, the pilot had accumulated about 25 hours of total flight experience in the L-39.

AIRCRAFT INFORMATION

The airplane was a retired Czech Republic military single engine, turbofan (jet) trainer, with tandem seating. An AI-25TL turbofan engine, which had two shafts, by-pass flow, 12-stages of compressor, an annular combustion chamber, and three stages of gas turbine, powered the airplane, which had a maximum sea level static thrust of 3,790 pounds.

According to maintenance records, the last annual inspection was performed April 28, 2003. During the inspection, no defects were noted with either the airframe or engine.

The manager of the airplane stated that the ejection seat system was disabled. He also stated that the rear seat oil temperature gauge was inoperative.

METEOROLOGICAL INFORMATION

At 1155, weather conditions at the Martin State Airport, which was located about 15 nautical miles south of the accident site, included calm winds, 10 miles visibility, and clear skies.

WRECKAGE AND IMPACT INFORMATION

The first impact point was observed at the southwest corner of the 3-story residential home. At the base of the home were fragments of the airplane's skin. About 20 feet beyond the home was a large hardwood tree that had fresh scars on the bark, near the base. The angle from the impact at the home, to the impact at the tree, was about 50 degrees.

At the base of the tree was the left aileron and fragments of the left wing. To the left of the tree was the left flap. About 8 feet right of the tree, was a 3-foot deep crater in the ground. Inside the crater were several hard-points, the speed brake, and a section of the rudder. About 20 feet left of the crater was the vertical stabilizer and the remaining section of rudder. About 10 feet beyond the crater was the mid-section of the left wing structure and the horizontal stabilizer. The left main landing gear assembly remained attached to the wing and was observed in the retracted position. The left wing flap indicator, which was a red and white barber pole pin located on the upper surface of the wing, sustained impact damage, and its position could not be determined.

About 30 feet beyond the crater was an approximate 10-foot section of the right wing. The separation point of the wing was approximately at the main landing gear wheel well area. The right wing flap surface remained attached, and was extended about 30 degrees. The right wing flap indicator indicated that the flap was set at 20 degrees. The right main landing gear assembly remained attached to the wing and was extended outboard about 45 degrees beyond its normal 90-degree position. When the landing gear assembly was examined, it could be positioned into the retracted position. Along side of the wing was the right aileron, which was separated from the wing.

About 80 feet beyond the right wing was the engine, which was separated from the main fuselage, and partially exposed to a post-crash fire. Examination of the engine revealed that it came to rest on its left side, on top of a small trailer and some shrubs. The engine was complete from the inlet case and bullet, to the fan exhaust duct. All of the fan ducts were buckled and crushed. The first and second stage fan disks were intact, and all of the respective blades were in place and full length. There was an approximate 270-degree arc of the first stage fan blades that had the outer 2-inches of the tips bent opposite the direction of rotor rotation. Within the 270-degree arc, there was a 90-degree arc of blades that had the leading edge tip corner bent towards the direction of rotor rotation. The first stage fan blades did not have any impact damage to the leading edges. There were several randomly located first stage fan blades that had tears on the trailing edges, which corresponded to damage on the leading edges of the first stage stator vanes. All of the second stage fan blades were bent opposite the direction of rotor rotation. The third stage rotor was not visible. The fan rotor could not be rotated.

The accessory gearbox section was intact except for the area that was exposed to the post crash fire, and all of the components were in place except for the fuel control, which was separated. The fuel control throttle arm was observed in the full power position; however, the arm was separated from its associated rigging.

No evidence of an uncontainment, case rupture, or in-flight fire, was noted during the engine examination.

About 20 feet beyond the engine was the main fuselage, which came to rest upright and was exposed to the post-impact fire.

The forward instrument panel, rear instrument panel, and flight controls were destroyed or separated from the fuselage; however, four gauges from the rear cockpit instrument panel were recovered and examined. The gauges were the engine tachometer, the engine fuel pressure indicator, and the oil pressure and temperature indicators. The engine tachometer needles were observed at "28 percent" for N1, and "56 percent" for N2. The fuel pressure needle was observed at "66," the oil pressure needle and oil temperature gage was observed at "2.5," and "-05;" respectively.

The landing gear selector and annunciator lights were destroyed.

All of the airplane's major components were accounted for at the accident site; however, flight control continuity could not be established due to impact damage and the post-impact fire.

MEDICAL AND PATHOLOGICAL INFORMATION

The Baltimore County Office of the Chief Medical Examiner, Baltimore, Maryland, performed an autopsy on the pilot, on August 25, 2003.

The FAA Toxicology and Accident Research Laboratory, Oklahoma City, Oklahoma conducted toxicological testing on the pilot.

ADDITIONAL INFORMATION

Flight Characteristics

According to the airplane's Flight Training manual, the time required for the engine to accelerate from a low engine speed to high engine speed (idle to max power), was approximately 9 to 12 seconds. "It is desirable, for safety reasons to maintain at least 70 percent RPM on landing approach until landing assured."

The manager of the airplane also flew in the airplane. He stated that he had flown with the accident pilot on at least two occasions, and recalled informing him to maintain 75 percent rpm or better while landing the airplane, in the event that a go-around had to be executed. He accentuated to the pilot that he needed to be aware that the engine took close to 12 seconds to spool up, and having the extra power lessened the engines response time in the event of a go-around.

Engine Instruments

According to the L-39 Flight Manual, the "normal setting" for the fuel pressure gauge was 65 kilopascal/centimeter squared, the oil pressure gauge was about 5 kilopascal/centimeter squared, and the oil temperature gage was about 90 degrees Celsius.

Wreckage Release

The airplane wreckage was released on August 25, 2003, to a representative of the owners insurance company.

Pilot Information

Certificate:	Commercial	**Age:**	64,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
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:**	August 16, 2002
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	6950 hours (Total, all aircraft), 25 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Aero Vodochody	**Registration:**	N298RD
Model/Series:	L-39ZO	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	731013
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	April 28, 2003 Annual	**Certified Max Gross Wt.:**	12500 lbs
Time Since Last Inspection:		**Engines:**	1 Turbo fan
Airframe Total Time:	2292 Hrs as of last inspection	**Engine Manufacturer:**	Aerotechnik
ELT:	Not installed	**Engine Model/Series:**	AI-25TL
Registered Owner:	Bond Jet LLC	**Rated Power:**	3790 Lbs thrust
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	MTN,22 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	11:55 Local	**Direction from Accident Site:**	180°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.17 inches Hg	**Temperature/Dew Point:**	24°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Baltimore, MD (MTN)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	Forest Hill Industrial Airpark MD31	**Runway Surface Type:**	Asphalt
Airport Elevation:	476 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	31	**IFR Approach:**	Unknown
Runway Length/Width:	2650 ft / 50 ft	**VFR Approach/Landing:**	Go around

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	39.584999,-76.391387

Administrative Information

Investigator In Charge (IIC):	Demko, Stephen
Additional Participating Persons:	Anthony Serio; FAA; Glen Burnie, MD
Original Publish Date:	January 24, 2005
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=57754