



National Transportation Safety Board Aviation Accident Final Report

Location:	Davenport, IA	Accident Number:	CEN12LA602
Date & Time:	09/01/2012, 1330 CDT	Registration:	N139GS
Aircraft:	AERO VODOCHODY L39C	Aircraft Damage:	Destroyed
Defining Event:	Loss of control in flight	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Air Race/Show		

Analysis

The accident airplane was one of three airplanes in an airshow performance. After overflying the spectators and while flying away from the flight line, the airplanes executed a “crossover break” maneuver, at the beginning of which the accident airplane was in the left wing position. As planned, the lead airplane would climb while the left wing position airplane would enter a right turn and the right wing position airplane would enter a left turn with adequate longitudinal spacing. During the maneuver, the accident airplane entered the right turn as planned, but then descended and impacted the terrain. A postimpact fire ensued. No evidence of an in-flight collision with either of the other airplanes was observed. Witnesses reported that they did not observe any movement of the airplane's flight control surfaces before the airplane impacted terrain, which would be inconsistent with the pilot attempting to recover from the descent. The postaccident examination did not reveal any preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of airplane control for reasons that could not be determined because postaccident examination did not reveal any anomalies that would have precluded operation.

Findings

Aircraft	Performance/control parameters - Not attained/maintained (Cause)
Personnel issues	Aircraft control - Pilot (Cause)

Factual Information

HISTORY OF FLIGHT

On September 1, 2012, approximately 1330 central daylight time, an Aero Vodochody L39C single-engine turbo-jet airplane, N139GS, was destroyed when it impacted terrain while maneuvering during an air show performance at the Davenport Municipal Airport (DVN), Davenport, Iowa. The commercial pilot sustained fatal injuries. The airplane was registered to the Warbird Education Foundation, Frisco, Texas, and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as an air show flight. Visual meteorological conditions prevailed and a flight plan was not filed. The flight originated from DVN approximately 1315.

Video and witness information documented the flight of three L-39 airplanes during their air show performance. According to the lead pilot, the three airplanes were traveling in a westerly direction away from the spectators and were executing a crossover break maneuver, which the accident airplane was in the left wing position. During the crossover break maneuver, the lead airplane first entered a climbing maneuver, the left wing position airplane entered a right turn and then the right wing position airplane entered a left turn with adequate longitudinal spacing. During the maneuver, the accident airplane entered the right turn, descended, and impacted the terrain. A post-impact fire ensued. No evidence of any in-flight collision with the other airplanes was observed. No communication or distress call were received by either the lead or right wing position pilot from the accident pilot.

Witnesses reported that they did not observe any movement of the airplane's flight control surfaces prior to the airplane impacting terrain.

Review of several videos showed that after the crossover break maneuver turns were performed, the lead and right wing position airplanes turned off their smoke and the left wing position airplane's smoke continued to remain on until the impact. According to a team representative, the right wing position airplane pilot calls for the break and smoke on/off.

PERSONNEL INFORMATION

The pilot, age 59, held a commercial pilot certificate with airplane single-engine land, airplane single-engine sea, airplane multi-engine land, and instrument airplane ratings. The pilot held type ratings for L-39, Mikoyan-Gurevich MiG-15 and MiG-17 airplanes.

His most recent Federal Aviation Administration (FAA) second class medical certificate was issued on May 29, 2012, without limitations.

The pilot's logbooks were not located during the investigation. According to a friend of the pilot, he had accumulated approximately 2,500 total flight hours and 600 hours in jet airplanes.

Friends of the pilot reported he was in excellent health, rarely consumed alcohol, and exercised regularly.

A friend noted the pilot had a history of G-tolerance issues. The friend reported the pilot blacked out momentarily during a formation flight and may have experienced G-related issues on two other occasions. The pilot attended ground school training on G awareness and also reviewed United States Air Force documentation on G training.

AIRCRAFT INFORMATION

The Aero Vodochody L-39 Albatross was a high-performance tandem seat jet trainer aircraft serial number 432833, manufactured in 1984. The airplane was powered by a single turbo fan Ivchenko AI-25TL 3,792-lb thrust engine.

The airplane was issued an experimental exhibition special airworthiness certificate on January 14, 2009. The airplane was registered to the owner on December 31, 2008.

The airplane logbooks were not located during the investigation. The most recent inspection and total aircraft times could not be determined. According to friends of the pilot, the airplane was in immaculate condition and there were no recent maintenance issues.

METEOROLOGICAL INFORMATION

At 1347, the DVN automated surface observing system reported the wind from 070 degrees at 14 knots, visibility 9 miles, decreasing rain, scattered clouds at 2,300 feet, sky overcast at 4,000 feet, temperature 22 degrees Celsius, dew point 20 degrees Celsius, and an altimeter setting of 29.97 inches of Mercury.

WRECKAGE AND IMPACT INFORMATION

Examination of the accident site by Federal Aviation Administration inspectors showed the airplane was severely fragmented and consumed by fire. The main wreckage came to rest 1.2 miles from DVN in a field. The airplane was recovered from the field and brought to a secure location for further examination.

Examination of the airplane by FAA inspectors and representatives familiar with L-39 airplanes revealed several disconnects in the flight control system due to impact and postaccident thermal damage. All major components of the airplane were accounted for at the accident site and no preaccident mechanical malfunctions or failures were noted with the airplane that would have precluded normal operation.

Two small video recorder devices were found at the accident site. The recorders were recovered and sent to the NTSB Vehicle Recorders laboratory in Washington, DC, for data extraction. Due to damage, no information was recovered from the video recorder devices.

MEDICAL AND PATHOLOGICAL INFORMATION

On September 3, 2012, an autopsy was performed on the pilot by the Iowa Office of the State Medical Examiner, Ankeny, Iowa. The pilot's death was attributed to multiple blunt force and thermal injuries.

Toxicological testing was performed by the FAA Civil Aerospace Medical Institute (CAMI), Oklahoma City, Oklahoma. The report revealed that testing for carbon monoxide and cyanide was not performed. Ethanol was detected in the liver, spleen, muscle, and heart. N-Propanol was detected in the spleen. These volatiles were consistent with postmortem production of alcohols.

ADDITIONAL INFORMATION

On February 29, 1984, the FAA released Advisory Circular 91-61, A Hazard In Aerobatics: Effects Of G Forces On Pilots. The document stated in part:

"...One little known, but important, aspect of tolerance of G's is the effect of rapid changes from

+Gz to -Gz, or vice versa. Because aerobatics induce such rapid changes, tolerance to changes could be highly significant. It is known, for example, that when one is subjected to -Gz, blood pressure receptors in the head and chest respond to the increased pressure and cause a reflex slowing of the heart. A rapid change to +Gz (for example, when the pilot executes a half-roll during a maneuver) would suddenly drop blood pressure in these receptors and there would be a rapid speeding up of the heart to maintain pressure; but because the reflex system requires some time to sense the need, the heart could be delayed in responding to this demand and blood flow to the brain might suddenly decrease...anything that reduces blood volume or cardiovascular response may reduce G tolerance. Dehydration, excessive sweating, severe sunburn, low blood pressure, prolonged standing or sitting, hypoxia, infection (even minor illnesses), and medications all lower G tolerance. Alcohol and hangovers will reduce your ability to perform aerobatic maneuvers. Make sure you are as fit as your aircraft...."

G Induced Loss of Consciousness (GLOC)

The average threshold of a pilot to blackout is 4.7 g's and laps in to unconsciousness at 5.4 g's. The rate of g on-load is a significant factor in establishing the amount of g load a pilot can withstand (AC-91-61).

History of Flight

Maneuvering-aerobatics	Loss of control in flight (Defining event)
------------------------	--

Pilot Information

Certificate:	Commercial; Private	Age:	59, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 Without Waivers/Limitations	Last Medical Exam:	05/29/2012
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	2500 hours (Total, all aircraft), 600 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	AERO VODOCHODY	Registration:	N139GS
Model/Series:	L39C	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Experimental	Serial Number:	432833
Landing Gear Type:	Retractable - Tricycle	Seats:	1
Date/Type of Last Inspection:	Unknown	Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	1 Turbo Jet
Airframe Total Time:		Engine Manufacturer:	IVCHENKO
ELT:	Installed, not activated	Engine Model/Series:	AL-25TL
Registered Owner:	WARBIRD EDUCATION FOUNDATION	Rated Power:	3792 lbs
Operator:	On file	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	DVN, 751 ft msl	Observation Time:	1347 CDT
Distance from Accident Site:	1 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:	90°	Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Scattered / 2300 ft agl	Temperature/Dew Point:	22° C / 20° C
Lowest Ceiling:	Overcast / 4000 ft agl	Visibility	9 Miles
Wind Speed/Gusts, Direction:	14 knots, 70°	Visibility (RVR):	
Altimeter Setting:	29.97 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	Light - In the Vicinity - Rain		
Departure Point:	Davenport, IA (DVN)	Type of Flight Plan Filed:	None
Destination:	Davenport, IA (DVN)	Type of Clearance:	None
Departure Time:	1315 CDT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	On-Ground
Total Injuries:	1 Fatal		

Administrative Information

Investigator In Charge (IIC):	Aaron M Sauer	Adopted Date:	01/13/2014
Additional Participating Persons:	Harrison McNaughton; Federal Aviation Administration; Des Moines, IA		
Publish Date:	01/13/2014		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=84919		

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.