Aviation Investigation Final Report

Location:	HILLSBORO, Ohio	**Accident Number:**	IAD97FA064
Date & Time:	April 8, 1997, 15:33 Local	**Registration:**	N13MN
Aircraft:	Cessna 414	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Witnesses observed the airplane overfly their homes at low altitude in a tight circular pattern. A witness about 1/2 mile from the airport '. . . watched the plane try to make a turn to the left trying to go back west to the Highland County Airport. The plane made a sharp turn, seemed to be having difficulty stabilizing the airplane . . . .' Also, a witness reported that she heard a loud noise, and then she observed an airplane just barely above the trees. The landing gear was down, and the airplane 'kept dipping up and down.' Another witness reported the airplane was 'wobbling left to right,' and then it descended into trees, struck vehicles, came to rest against a tree, and was destroyed by a postcrash fire. A person, who flew with the pilot as a safety pilot on several occasions, reported that the pilot had a habit of making steep close-in turns, from downwind to base, to final; and he noticed 'lack in airspeed management during approach.' Examination of the wreckage did not disclose any preimpact failure of the airplane or engine.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: failure of the pilot to maintain adequate airspeed, while maneuvering, which resulted in an advertent stall and collision with trees, vehicles, and the terrain.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: MANEUVERING

Findings
1. LOW ALTITUDE FLIGHT/MANEUVER - PERFORMED - PILOT IN COMMAND
2. (C) AIRSPEED - INADEQUATE - PILOT IN COMMAND
3. (C) STALL - INADVERTENT - PILOT IN COMMAND

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

Findings
4. OBJECT - TREE(S)
5. OBJECT - VEHICLE

Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On April 8, 1997, at 1533 eastern daylight time, N13MN, a Cessna 414, was destroyed when it impacted trees and terrain about 1.5 miles east of the Highland County Airport in Hillsboro, Ohio. The certificated commercial pilot and passenger were fatally injured. Visual meteorological conditions prevailed and a flight plan was not filed. The flight originated at Cincinnati Municipal Airport Lunken Field, Cincinnati, Ohio, about 1430.

The pilot, a professor at the University of Cincinnati, was taking one of his students for a ride to the Highland County Airport, a frequent destination. Witnesses heard and observed the airplane overfly their homes at a low altitude in a tight circular pattern turning to a northerly heading. A witness about 1/2 mile from the airport stated:

"As I was driving I noticed a plane to my right. I watched the plane try to make a turn to the left trying to go back west to the Highland County Airport. The plane made a sharp turn, seemed to be having difficulty stabilizing the airplane... ."

Another witness stated:

"I was out running just north of my house maybe 100 feet. I heard a loud noise I looked east and saw a plane just barely above the tree tops. It had its landing gear down, it came from the east and was sort of arching almost circling it was extremely low. The plane kept dipping up and down and at one point was completely perpendicular flying sideways. It started to lift up again and then struck the ground... ."

A witness standing in the backyard of the accident site stated:

"I was standing behind my car in the driveway, I saw a plane acting weird. He was upright but he was wobbling left to right ...the plane just barely missed the powerlines. It looked as if he was trying to pull up, the right wing was tilted up. Then he started coming down so I ran. Out of the corner of my eye I saw the plane hit the tree tops after that it hit the carport and everything scattered and there was fire and smoke."

The accident occurred during the hours of daylight at 39 degrees, 11 minutes north latitude, and 83 degrees, 30 minutes west longitude.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with ratings for single and multiengine land, and

instrument airplane. According to Federal Aviation Administration (FAA) records, the pilot reported on his last application for a third class medical certificate over 1,500 hours of flight time. The third class medical certificate was issued on October 26, 1995, with limitations to wear corrective lenses. His log book was not located.

WRECKAGE AND IMPACT INFORMATION

The airplane wreckage was examined at the accident site on April 9 and 10, 1997. The examination revealed that all major components of the airplane were accounted for at the scene. The airplane wreckage came to rest against a tree, and was destroyed by a post crash fire.

The wreckage distribution path was in the general direction of 360 degrees. Initial tree impact scars were observed in the treetops. The wreckage path extended through a parked van, and two cars parked side by side.

The main wreckage which consisted of the horizontal stabilizer, fuselage, wings, vertical stabilizer, came to rest about 130 feet from the initial impact point (IIP). All flight instruments, and the main wreckage were destroyed by fire.

The main landing gear was found in the down and locked position. The flap, aileron, rudder, and elevator trim actuators were measured. According to the Cessna representative, the measurements corresponded to 15 degrees of flaps, 2 degrees up aileron, 7 degrees left rudder, and 15 to 17 degrees down elevator trim.

The right portion of the right tip tank which included the beacon light and landing light, was found in the vicinity of the IIP. Scars similar to the right wing tip were observed on the roof of the parked van, located about 85 feet beyond the IIP.

The nosewheel, right engine nacelle, and portion of the right tip tank were found between the parked van and the two cars.

The left auxiliary fuel tank, left engine turbocharger, and inboard section of the left wing were about 120 feet beyond the IIP. The rudder remained attached to the vertical stabilizer, and was in the vicinity of the main wreckage.

Both propellers were separated from their respective engines. The left engine was detached from the firewall, and was found inverted in the main wreckage. The engine had sustained fire damage. The starter was detached from the starter adapter. The turbocharger and related components remained attached to the left nacelle. The fuel control unit remained attached to the throttle body unit which remained with the nacelle. The forward portion of the engine sump was destroyed by fire.

The right engine sustained fire damage, and both magnetos were detached and destroyed by

fire. The starter was detached from the engine, and the oil sump was flattened. The turbocharger had sustained fire damage.

Examination of the remainder of the wreckage produced no useful information due to fire and impact damage.

TESTS AND RESEARCH

Both engines were removed and sent to Teledyne Continental Motors, where they were examined on May 12 and 13 under the supervision of the National Transportation Safety Board (NTSB). The examination revealed that both engines exhibited extensive fire and impact damage. Both engines interior components exhibited normal operational signatures.

The engines displayed no indication of any pre-impact anomalies or distress that would have precluded normal engine operation prior to impact.

Both propellers were removed and sent to Mc Cauley, where they were examined on April 29 under the supervision of the NTSB. During the examination no pre-impact failures were determined. The blades were in a relative low blade angle position. Neither propeller was at or near feather position at impact. Propeller damage for both propellers was very similar.

The turbocharger exhaust ducts for the right and left engines, and the right firewall were removed and sent to the NTSB lab for examination. According to the NTSB Metallurgist's factual report, the right engine turbocharger exhaust duct was heavily crushed over its entire length, and contained a large irregular hole approximately in the middle of its length. The fracture surface around perimeter of the hole was darkly discolored, and contained no evidence of fresh fracture features. Examination of the inner diameter surface of the duct revealed heavy accumulation of corrosion deposits and exhaust gas residue.

A hardness test was performed on the right firewall. The examination showed no evidence of a fire pattern or splattered material, associated with the location of the exhaust duct. A strip of material was cut from the top to the bottom of the firewall in the area where the firewall was closest to the right duct. Hardness measurements were made approximately every inch along this strip. The results ranged between HRA 52.9 and HRA 56.7 and showed no gradient from top to bottom.

MEDICAL AND PATHOLOGICAL INFORMTION

An autopsy and toxicological testing of the pilot was conducted by Dr. Rodney F. Tucay, M.D. Forensic Pathologist of the Montgomery County, Ohio.

Toxicological testing was conducted by the FAA Toxicology Accident Research Laboratory, Oklahoma City, on August 15, 1997.

ADDITIONAL INFORMTION

A safety pilot with approximately 800 hours in make and model, stated that he flew with the accident pilot every 30 days, and on several occasions. He said the accident pilot had a habit of making steep turns, especially from downwind to base, to final approach. In a written statement, he said:

"... I told him he needed to widen out his pattern, and make longer more gently approaches...I noticed lack in airspeed management during approach... ."

The airplane wreckage was released on April 10, 1997, to A. J. Fiedler a representative of the owner's insurance company.

Pilot Information

Certificate:	Commercial	**Age:**	66,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):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	October 26, 1995
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1500 hours (Total, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N13MN
Model/Series:	414 414	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	4140422
Landing Gear Type:	Retractable - Tricycle	**Seats:**	8
Date/Type of Last Inspection:	June 20, 1996 Annual	**Certified Max Gross Wt.:**	6500 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	4333 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	TSIO-520-J
Registered Owner:	MIRKO M NUSSBAUM	**Rated Power:**	310 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DAY ,1009 ft msl	**Distance from Accident Site:**	65 Nautical Miles
Observation Time:	15:41 Local	**Direction from Accident Site:**	310°
Lowest Cloud Condition:	Scattered / 6000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 7500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	17 knots / 21 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	9°C / -3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	CINCINNATI , OH (LUK)	**Type of Flight Plan Filed:**	None
Destination:	(HOC)	**Type of Clearance:**	None
Departure Time:	14:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	HIGHLAND COUNTY HOC	**Runway Surface Type:**	Asphalt
Airport Elevation:	978 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	23	**IFR Approach:**	None
Runway Length/Width:	3520 ft / 75 ft	**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	2 Fatal	**Latitude, Longitude:**	39.199188,-83.610519(est)

Administrative Information

Investigator In Charge (IIC):	Drake-nurse, Beverley
Additional Participating Persons:	PETER DOELGER; CINCINNATI , OH GEORGE HOLLINGSWORTH; RESTON , VA LEAH RIDDLE; WICHITA , KS TOM KNOPP; VANDALIA , OH
Original Publish Date:	July 13, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
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