



National Transportation Safety Board Aviation Accident Final Report

Location:	Gray, TN	Accident Number:	ERA11LA344
Date & Time:	06/15/2011, 1405 EDT	Registration:	N15L
Aircraft:	BEECH A100	Aircraft Damage:	Substantial
Defining Event:	Inflight upset	Injuries:	2 None
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

The airplane was flying in instrument meteorological conditions at flight level 200 (about 20,000 feet), and a large area of thunderstorm activity was located to the northwest. About 20 miles from the thunderstorm activity, the airplane began to encounter moderate turbulence and severe icing conditions. The pilot deviated to the south; however, the turbulence increased, and the airplane entered an uncommanded left roll and dive. The autopilot disengaged, and the pilot's attitude indicator dropped. The pilot leveled the airplane at an altitude of 8,000 feet and landed without further incident. Subsequent examination revealed that one-third of the outboard left elevator separated in flight and that the empennage was substantially damaged. Meteorological and radar data revealed the airplane entered an area of rapidly intensifying convective activity, which developed along the airplane's flight path, and likely encountered convectively-induced turbulence with a high probability of significant icing. The effect of icing conditions on the initiation of the upset could not be determined; however, airframe structural icing adversely affects an airplane's performance and can result in a loss of control.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: An encounter with convectively-induced turbulence and icing, which resulted in an in-flight upset and a loss of airplane control.

Findings

Aircraft	Performance/control parameters - Not specified
Environmental issues	Thunderstorm - Effect on equipment (Cause) Convective turbulence - Effect on equipment (Cause) Conducive to structural icing - Effect on equipment (Cause)

Factual Information

On June 15, 2011, about 1405 eastern daylight time, a Beech A100, N15L, operated by Dynamic Avlease Inc., was substantially damaged when it experienced an in-flight upset, while in cruise flight near Gray, Tennessee. The two certificated commercial pilots were not injured. Instrument meteorological conditions (IMC) prevailed and an instrument flight rules flight plan had been filed for the flight that departed Bridgewater Air Park (VBW), Bridgewater, Virginia, destined for Mid-Continent Airport (ICT), Wichita, Kansas. The positioning flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

According to the flight crew, the airplane was flying in smooth IMC conditions at flight level 200 (20,000 feet mean sea level), with an area of "moderate to heavy to extreme" precipitation located about 30 miles to the northwest. As the airplane approached 20 miles from the weather, it began to experience moderate turbulence and rime ice on the windscreen. The pilot flying deviated course 40-degrees to the south. Turbulence increased further for about 10 seconds, and the airplane then entered an uncommanded left roll and dive. The autopilot disengaged and the pilot's electrically driven attitude indicator tumbled. The flight crew reduced the engine power levers to idle and were able to recover utilizing the copilot's vacuum driven attitude indicator. The airplane was returned to straight and level flight at an altitude of 8,000 feet; however, flight control instability persisted. The flight crew subsequently diverted to Tri-Cities Regional Airport (TRI), Blountville, Tennessee, where the airplane landed without further incident.

Subsequent examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed that the outboard one-third of the left elevator separated in flight, and the outboard right elevator was deformed downward. In addition, the horizontal stabilizer bulkhead frame was fractured and the aft portion of the airframe sustained several areas of deformation.

Review of FAA air traffic control information revealed that the flight crew requested an approximate 15 to 20 degree left deviation at 1405:05, which was approved 11 seconds later. Broken transmissions consistent with the in-flight upset began at 1405:50.

According to an NTSB Weather Study, satellite imagery and North American Mesoscale model soundings corresponded to cloud-top heights in the accident area of about 32,000 and 36,000 feet; respectively. Weather radar data revealed heavy values of reflectivity west and northwest of the airplane consistent with convective activity, as it approached the area of the in-flight upset. At 1359, reflectivity values in the immediate area of the accident location were scarce and light; however, by 1407, intensification of reflectivity values were observed immediately along the airplane's flight path. By 1412, this area of reflectivity had further intensified in a pattern consistent with developing convection. A three-dimensional projection of reflectivity values at the area of the in-flight upset confirmed significant vertical development in the convective area during the minutes surrounding the accident time. Several convective significant meteorological information (SIGMETs) were issued for the accident region prior to the accident time; however, none were active for the accident location. The flight crew subsequently filed a pilot report pertaining to the in-flight upset, in which the icing conditions were described as "severe clear/rime." [For additional information regarding meteorological conditions, please see the NTSB Weather Study located in the public docket.]

The operator reported the pilot's total flight experience as 4,837 hours; which included 1,941 hours in multiengine airplanes, and 87 hours in the same make and model as the accident

airplane.

The airplane was maintained under a continuous airworthiness inspection program, and had been operated for approximately 16,170 total hours at the time of the accident.

With regards to encountering severe icing conditions, the airplane flight manual stated, in part, "...Warning: Severe icing may result from environmental conditions outside of those for which the airplane is certificated." Procedures for exiting severe icing conditions included disengaging the autopilot, after holding the control wheel firmly.

History of Flight

Enroute-cruise	Windshear or thunderstorm Turbulence encounter Structural icing Inflight upset (Defining event)
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Pilot Information

Certificate:	Flight Instructor; Commercial	Age:	39, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last Medical Exam:	02/07/2011
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	07/08/2010
Flight Time:	4837 hours (Total, all aircraft), 87 hours (Total, this make and model), 4491 hours (Pilot In Command, all aircraft), 78 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Pilot Information

Certificate:	Commercial	Age:	38, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last Medical Exam:	01/21/2011
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	03/10/2010
Flight Time:	900 hours (Total, all aircraft), 2 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	BEECH	Registration:	N15L
Model/Series:	A100	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	B-212
Landing Gear Type:		Seats:	5
Date/Type of Last Inspection:	06/09/2011, Continuous Airworthiness	Certified Max Gross Wt.:	12008 lbs
Time Since Last Inspection:	2 Hours	Engines:	2 Turbo Prop
Airframe Total Time:	16170 Hours	Engine Manufacturer:	P&W CANADA
ELT:	C91A installed, not activated	Engine Model/Series:	PT6A-34
Registered Owner:	DYNAMIC AVLEASE INC	Rated Power:	750 hp
Operator:	DYNAMIC AVLEASE INC	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Day
Observation Facility, Elevation:	TRI, 1333 ft msl	Observation Time:	1353 EDT
Distance from Accident Site:	5 Nautical Miles	Direction from Accident Site:	20°
Lowest Cloud Condition:	Scattered / 6000 ft agl	Temperature/Dew Point:	25° C / -11° C
Lowest Ceiling:	Broken / 25000 ft agl	Visibility	10 Miles
Wind Speed/Gusts, Direction:		Visibility (RVR):	
Altimeter Setting:	29.97 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Bridgewater, VA (VBW)	Type of Flight Plan Filed:	IFR
Destination:	Wichita, KS (ICT)	Type of Clearance:	IFR
Departure Time:	1250 EDT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	36.586389, -82.476667 (est)

Administrative Information

Investigator In Charge (IIC):	Luke Schiada	Adopted Date:	06/14/2012
Additional Participating Persons:	Doyle L Ferguson; FAA/FSDO; Nashville, TN Mike Gibbons; Hawker Beechcraft Corporation; Wichita, KS Ben Coleman; Dynamic Aviation; Bridgewater, VA		
Publish Date:	06/14/2012		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=80789		

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