Aviation Investigation Final Report

Location:	Harbor Springs, Michigan	**Accident Number:**	CHI07LA059
Date & Time:	January 12, 2007, 18:30 Local	**Registration:**	N425TN
Aircraft:	Cessna 425	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Minor, 1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that during cruise descent the airplane accumulated about 1/2-to 3/4-inch of rime ice between 8,000 and 6,000 feet. During the approach, the pilot noted that a majority of the ice had dissipated off the leading edge of both wings, although there was still trace ice on the aft-portion of the wing deice boots. The pilot maintained an additional 20 knots during final approach due to gusting winds from the north-northwest. He anticipated there would be turbulence caused by the surrounding topography and the buildings on the north side of the airport. While on short final for runway 28, the pilot maintained approximately 121 knots indicated airspeed (KIAS) and selected flaps 30-degrees. He used differential engine power to assist staying on the extended centerline until the airplane crossed the runway threshold. After crossing the threshold, the pilot began a landing flare and the airspeed slowed toward red line (92 KIAS). Shortly before touchdown, the airplane "abruptly pitched up and was pushed over to the left" and flight control inputs were "only marginally effective" in keeping the wings level. The airplane drifted off the left side of the runway and began a "violent shuddering." According to the pilot, flight control inputs "produced no change in aircraft heading, or altitude." The pilot advanced the engine throttles for a go-around as the left wing impacted the terrain. The airplane cartwheeled and subsequently caught fire. No pre-impact anomalies were noted with the airplane's flight control systems and deice control valves during a post-accident examination. No ice shapes were located on the ground leading up to the main wreckage. The reported surface wind was approximately 4 knots from the north-northwest.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain aircraft control and adequate airspeed during landing flare. Contributing to the accident was the aerodynamic stall/mush encountered at a low altitude.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
1. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
2. (C) AIRSPEED - NOT MAINTAINED - PILOT IN COMMAND
3. (C) STALL/MUSH - ENCOUNTERED - PILOT IN COMMAND
4. ALTITUDE - LOW

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
5. TERRAIN CONDITION - GROUND

Occurrence #3: FIRE
Phase of Operation: STANDING

Factual Information

On January 12, 2007, at 1830 eastern standard time (est), a Cessna 425, N425TN, piloted by a commercial pilot, impacted terrain while landing on runway 28 (4,157 feet by 75 feet, dry asphalt) at Harbor Springs Airport (MGN), Harbor Springs, Michigan. The airplane was destroyed during a subsequent ground fire. Visual meteorological conditions prevailed at the time of the accident. The personal flight was operating under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91 while on an instrument flight rules (IFR) flight plan. The pilot and one passenger reported minor injuries. A second passenger reported no injuries. The flight departed Toledo Express Airport (TOL), Toledo, Ohio, at 1730 est.

The pilot reported that after departure he climbed to his assigned cruise altitude of 16,000 feet mean sea level (msl). The airplane encountered light rime icing between 12,000 and 14,000 feet during the climb. The accumulated ice dissipated off the leading edges of both wings during cruise flight above the clouds at 16,000 feet. During cruise descent, the airplane accumulated about 1/2-to 3/4-inch of rime ice between 8,000 and 6,000 feet. He cycled the deice boots several times and the ice began to dissipate as the airplane continued to descend.

The pilot requested and was cleared for the GPS Runway 28 approach into MGN. He monitored the local weather reports using an onboard weather datalink. He reported the winds were 340 degrees at 10 knots, gusting 16 knots. During the GPS approach, the pilot noted that a majority of the ice had dissipated, although there was still trace ice on the aft-portion of the wing deice boots. The airplane descended below the clouds about 7 nautical miles (nm) from the airport. The pilot visually acquired the runway and referenced its corresponding precision approach path indicator (PAPI) for vertical guidance down to the runway.

The pilot maintained an additional 20 knots during final approach due to gusting winds from the north-northwest. He anticipated there would be turbulence caused by the surrounding topography and the buildings on the north side of the airport. While on short final for the runway, the pilot maintained approximately 121 knots indicated airspeed (KIAS) and selected flaps 30-degrees. He used differential engine power to assist staying on the extended centerline until the airplane crossed the runway threshold. After crossing the threshold, the pilot began a landing flare and the airspeed slowed toward red line (92 KIAS). Shortly before touchdown, the airplane "abruptly pitched up and was pushed over to the left" and flight control inputs were "only marginally effective" in keeping the wings level. The airplane drifted off the left side of the runway and began a "violent shuddering." According to the pilot, flight control inputs "produced no change in aircraft heading, or altitude." The pilot advanced the engine throttles for a go-around as the left wing impacted the terrain. The airplane cartwheeled and subsequently caught fire.

The closest weather reporting facility was at the destination airport (MGN). The airport was

equipped with an automated weather observing system (AWOS). At 1834 est, the MGN AWOS reported the following weather conditions: Wind 350 degrees true at 4 knots; visibility 10 statute miles; broken ceiling at 2,200 feet above ground level (agl), overcast ceiling at 5,500 feet agl; temperature -3 degrees Celsius; dew point -7 degrees Celsius; altimeter setting 30.22 inches of mercury. The airport facility directory indicated that the AWOS wind data is unreliable between 260-280 degrees true.

The next closest weather reporting facility was at Pellston Regional Airport (PLN), about 10 nm northeast of MGN. The airport was equipped with an automated weather observing system (AWOS). At 1854 est, the PLN AWOS reported the following weather conditions: Wind 340 degrees true at 9 knots; visibility 10 statute miles; scattered clouds at 2,000 feet agl, overcast ceiling at 5,000 feet agl; temperature -4 degrees Celsius; dew point -9 degrees Celsius; altimeter setting 30.24 inches of mercury.

The power supply box for the PAPI had a rubber transfer mark on its exterior surface, consistent with being struck by a tire. There was a 178 foot long ground scar between the power supply and the main wreckage. No ice shapes were located on the ground along the ground scar. The fuselage was oriented in an inverted position, heading southwest. The fuselage sustained substantial fire damage. The tail section was separated in multiple pieces. The landing gear was fully extended. Flight control cable continuity was established from the cockpit to each control surface bellcrank. The flaps were partially extended. The wing deice control valves were examined and no anomalies were noted. No anomalies were noted with the tail deice control valve when tested and no blockages were observed within the valve assembly.

Pilot Information

Certificate:	Commercial; Private	**Age:**	49,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:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	September 1, 2006
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 1, 2006
Flight Time:	1991 hours (Total, all aircraft), 60 hours (Total, this make and model), 1991 hours (Pilot In Command, all aircraft), 57 hours (Last 90 days, all aircraft), 24 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N425TN
Model/Series:	425	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	0196
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	October 1, 2006 Continuous airworthiness	**Certified Max Gross Wt.:**	8600 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo prop
Airframe Total Time:	2345 Hrs at time of accident	**Engine Manufacturer:**	Pratt & Whitney
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	PT-6A-112
Registered Owner:	Lyden Air Company	**Rated Power:**	450 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	MGN,686 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	18:34 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 2200 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	350°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.21 inches Hg	**Temperature/Dew Point:**	3°C / 7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Toledo, OH (TOL)	**Type of Flight Plan Filed:**	IFR
Destination:	Harbor Springs, MI (MGN)	**Type of Clearance:**	IFR
Departure Time:	17:30 Local	**Type of Airspace:**	

Airport Information

Airport:	Harbor Springs Airport MGN	**Runway Surface Type:**	Asphalt
Airport Elevation:	686 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	28	**IFR Approach:**	Global positioning system
Runway Length/Width:	4157 ft / 75 ft	**VFR Approach/Landing:**	Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Minor, 1 None	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor, 1 None	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	Anson Gray; Federal Aviation Administration, Grand Rapids FSDO; Grand Rapids, MI Henry Soderlund; Cessna Aircraft Company; wichita, KS
Original Publish Date:	March 31, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=65227