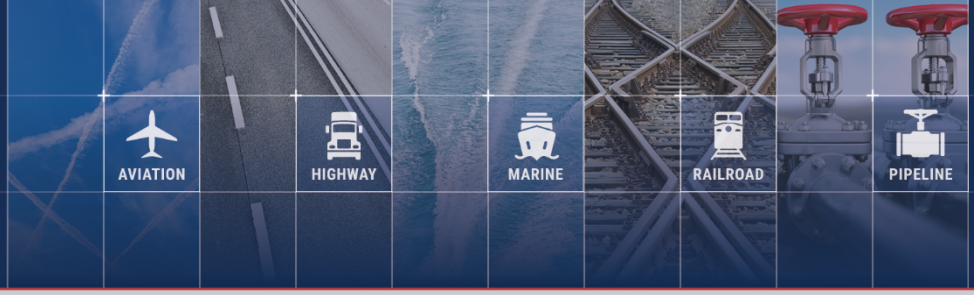

Aviation Investigation Factual Report

Location:	Pittsville, Wisconsin	**Accident Number:**	CEN09GA242
Date & Time:	April 8, 2009, 14:39 Local	**Registration:**	N2489S
Aircraft:	Cessna 337	**Aircraft Damage:**	None
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Fatal
Flight Conducted Under:	Public aircraft		

Factual Information

HISTORY OF FLIGHT

On April 8, 2009, at 1439 central daylight time, a Cessna 337C, N2489S, operated by the Wisconsin Department of Natural Resources (DNR), impacted an agricultural field while responding to a ground fire. Visual meteorological conditions prevailed at the time of the accident. The airplane was being operated as a public-use aircraft. The pilot, who was the sole occupant, was fatally injured. The flight responded to the fire by departing from Necedah Airport, Necedah, Wisconsin, at 1411.

The Rack Township Fire Department responded to a ground fire that started from a burn barrel located at a residence north of the agricultural field where the airplane impacted. A wooded area separated the residence and the agricultural field. The Fire Department Deputy Chief stated that when he arrived on scene, the Cessna 337C, was flying above the area at an altitude that was “several thousand” feet above ground level and in the “stratosphere.” The Deputy Chief then walked through the wooded area to a point that was about 100 feet north of the main wreckage. From his vantage point, he saw the airplane circle three times while descending. He did not hear a decrease in engine noise during the airplane’s descent from “several thousand feet.” During the third circle, he saw the airplane fly south at an altitude that the Deputy Chief “seemed low” and was about 100 feet above the trees. About “15 seconds” before the accident, the airplane continued in a southerly direction and was simultaneously banking in a left 30-45 degree roll attitude. The airplane was about 150 yards from the tree line when it made its turn to the north. The airplane continued to descend and roll out to an almost wings level attitude and was on a northerly heading approaching the tree line. The Deputy Chief stated that the airplane was now at an altitude of about 35 feet above the ground. He then heard the airplane engine noise increase about “5 seconds” prior to the left wing dropping and it seemed to him that the airplane was descending. The airplane then impacted the ground. The Deputy Chief stated that this was the third DNR airplane the he has seen responding to a fire and the other airplanes flew “way up there” and were more than 100 feet in altitude when they were responding and did not fly lower. He stated that the landing gear was retracted, and there were no lights illuminated on the Cessna 337C.

The Pittsville Fire Department Chief stated that he saw the Cessna 337C at an altitude of about 1 ½ - 2 times the height of the trees. The airplane descended at a “sharp angle” during the third time the airplane was circling. He stated that the engine was running.

PERSONNEL INFORMATION

The pilot held an airline transport pilot certificate with an airplane multiengine airplane rating and commercial pilot privileges with an airplane single-engine land rating. He also held a flight

instructor certificate with airplane single-engine, airplane multiengine, and instrument airplane ratings. As of April 8, 2009, he accumulated a total flight time of 4,739.1 hours.

The pilot served as a DNR pilot of Cessna 182 and 185 airplanes prior to receiving a Cessna 337 initial flight check dated April 3, 2009, which was 1.0 hours in duration that originated from Wittman Regional Airport (OSH), Oshkosh, Wisconsin (A pilot logbook entry indicates a local flight from OSH on March 27, 2009, that was 1.0 hours in duration). Since the initial flight check, the pilot accumulated an additional 3.1 hours of flight time in the accident airplane during two flights on April, 7, 2009, and one flight on April 8, 2009.

Federal Aviation Administration (FAA) records for the pilot show no reported incidents, accidents, or enforcement actions.

On February 25, 2009, the pilot was issued a first class airman medical certificate with no limitations.

AIRCRAFT INFORMATION

The 1967 Cessna 337C was operating as a public-use aircraft as of January 7, 2009, at a Hobbs time of 205.3 hours. The airplane was also used by the DNR to conduct aerial observations. The airplane was powered by two Continental IO-360-CB engines. The front engine was serial number 236534 and the rear engine was serial number 236536.

The airframe and engines received their last annual inspections on September 15, 2008, at an aircraft total time of 2,530.0 hours and a Hobbs time of 192.0 hours.

The airplane was equipped with Horton STOL kits under supplemental type certificates (STC) SA937CE (Installation of leading edge cuffs, stall fences, droop wing tips, and vortex generators on rear engine lower cowling) and SA2821CE (Installation of wing tips).

The airplane was equipped with BAS, Inc. shoulder harness and harness system under STC SA2067NM.

WRECKAGE AND IMPACT INFORMATION

The main wreckage, which consisted of the fuselage, empennage, wings, and both engines were located at 44 degrees 28.705 minutes North and 90 degrees 16.690 minutes West at an elevation of 1,094 feet on a fallow wheat field with north/south rows. The fuselage was resting in an upright position with a tail to nose heading of about 240 degrees.

The left wing displayed wrinkling along the wing’s spanwise axis with greater relative damage than the right wing. Both wing were attached to the fuselage but were fractured through at the wing strut attachment. The forward and aft wing spar attachment points were fractured. The fractures exhibited deformation and surface features consistent with overload. All of the wing

fuel caps were in place.

The stall fence on the right wing was attached to the wing and the left wing stall fence was separated. The left stall fence was deformed and found laying about 15 feet behind the main wreckage.

The wing flap jackscrew was extended 3.1 inches, which equates to 10 degrees of flap extension. The cockpit flap control switch was in the 10-degree flap position.

Flight control continuity from the control surfaces to both cockpit flight controls was confirmed. Engine and propeller control continuity from the cockpit to the fuel servo and propeller governor was confirmed.

The landing gear was in the retracted position.

The front engine propeller was separated from the hub, and the propeller hub bolts were separated. One blade of the propeller was separated through a fracture that exhibited a surface consistent with overload. The propeller also displayed bending and twisting along the span. The rear engine propeller was attached to the engine and displayed twisting along one blade.

Both engines were rotated at their propeller hubs by hand after removal of the top spark plugs. During rotation, air was noted to be drawn in and expelled from each of the top cylinder spark plug holes.

The front and rear engine magneto to engine timing could not be verified due to impact damage. Both magnetos on each engine were rotated by hand and a spark from each lead was noted.

The fuel pumps from both engines were operated using an electric drill with 100 low lead aviation fuel. Fuel was poured into the inlet port of each pump and was noted to discharge from the output port while moving the mixture control lever from the full rich mixture to the idle cutoff positions. Fuel ceased to flow when the mixture control was placed into the idle cut off position at the fuel pump. Both fuel pump couplings were intact.

An undetermined amount of oil drained from a hole in the oil pan of the front engine. An undetermined amount of engine oil was drained from the rear engine. The front engine did not have an oil screen but was equipped with an oil filter, which did not have obstruction or debris. The rear engine oil screen was unobstructed and did not contain debris.

The fuel manifold valve screens and fuel injectors for both engines were unobstructed.

First responders reported smelling fuel when they responded to the accident. During recovery, fuel spilled from the right wing.

MEDICAL INFORMATION

An autopsy of the pilot was conducted by the Wood County Coroner on April 10, 2009. The autopsy's final anatomic diagnosis reported multiple blunt force injuries, no significant disease identified, no ethanol detected, and negative drug screen results.

The FAA's Final Forensic Toxicology Fatal Accident report of the pilot was negative for all substances tested.

FIRE

The ground fire emanated from a garbage fire next to house at a location of 44 degrees 28.796 feet and 090 degrees 16.762 minutes at an elevation of 1,117 feet.

There was no evidence of soot or fire in the airplane except for a small area by the front engine left cowl flap next to the firewall. First responders reported that a flame began at the bottom of the fuselage when they were extracting the pilot, but it was extinguished with the application of a small amount of an unknown extinguishing substance.

TEST AND RESEARCH

The accident airplane and two other airplanes operated by the DNR, N185NR and N6991H, were equipped with Horton STOL kit installations. The airplanes did not have any additional labeling, placards, or airspeed indicator markings relating to changes to aircraft performance. Also, there are no STC supplements available for the airplanes' flight manuals with quantitative data showing changes in aircraft performance. The STC instructions associated with the accident airplane's STOL kit, state the following:

This aircraft with HORTON STOL CRAFT CONVERSION installed may be operated in the same manner as called out in the AIRCRAFT HANDBOOK provided by CESSNA. To obtain MAXIMUM PERFORMANCE from an aircraft equipped with a HORTON STOL CRAFT CONVERSION, it is suggested that each pilot FAMILIARZE himself or herself with the aircraft at a SAFE ALTITIDE to assure them of the STABILITY AT SLOWER AIRSPEEDS THAN CALLED OUT IN the STANDARD CESSNA HANDBOOK. Because of PILOT PROFICIENCY and CONDITION VARIATIONS of each aircraft, STOL PERFORMANCE will vary with each aircraft.

A Cessna 337 A/C Familiarization questionnaire completed by the accident pilot lists the airplanes V-speeds, which include VS0 (VS0 is the minimum steady flight speed with flaps extended) and VS1 (VS1 is the stall speed with flaps and landing gear retracted). These speeds are handwritten as: "VS0 66" and "VS1 75". The airplane flight manual recovered from the wreckage lists for 0 degrees of bank, power off stall speed, with the landing gear down, and full flaps as 67 mph, calibrated airspeed (CAS) and the landing gear and flaps retracted stall speed was listed as 78 mph, CAS.

According to the DNR representative for the investigation, who was also the pilot that conducted the accident pilot's Cessna 337C initial flight check, aircraft are flown as single-pilot operations in aerial observations. While observing, pilots would fly at an airspeed near stall with an intermittent stall warning and visual reference was made outside of the cockpit and not at the airspeed indicator. He said that flying was by aircraft feel more than by reference to instruments. He stated that the airspeed and configuration for observation flights in the Cessna 337C are 95 mph indicated airspeed with 10 degrees of flaps. There is no minimum altitude for flight operations. He stated that the DNR has a low altitude waiver issued by the FAA's Milwaukee Flight Standards District Office to conducted flights at altitudes below those required by Federal Aviation Regulations. Following review of his statement, the DNR representative later stated that his statements may not reflect those procedures used in other DNR operations and/or by pilots.

The low altitude waiver is applicable to Parts 91.119(b), (c) and 91.313(3). Part 91.119 Minimum safe altitudes states:

> Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:
> (a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.
> (b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.
> (c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

The aircraft status was changed from Part 91 to public-use by the accident pilot on January 7, 2009. According to the DNR, aircraft can be changed to public-use if passengers are not to be carried.

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	36,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 1 Without waivers/limitations	**Last FAA Medical Exam:**	February 25, 2009
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	January 18, 2008
Flight Time:	4681 hours (Total, all aircraft), 4 hours (Total, this make and model), 3104 hours (Pilot In Command, all aircraft), 43 hours (Last 90 days, all aircraft), 17 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N2489S
Model/Series:	337 C	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	337-0789
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	September 15, 2008 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	2530 Hrs as of last inspection	**Engine Manufacturer:**	CONTINENTAL
ELT:	Installed	**Engine Model/Series:**	IO-360-CB
Registered Owner:	State of Wisconsin/DOA	**Rated Power:**	210 Horsepower
Operator:	State of Wisconsin/DNR	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	ISW,1021 ft msl	**Distance from Accident Site:**	23 Nautical Miles
Observation Time:	13:54 Local	**Direction from Accident Site:**	110°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / 20 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.65 inches Hg	**Temperature/Dew Point:**	10°C / -12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Necedah, WI (DAF)	**Type of Flight Plan Filed:**	None
Destination:	Pittsville, WI	**Type of Clearance:**	None
Departure Time:	14:11 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	None
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	44.450065,-90.130317(est)

Administrative Information

Investigator In Charge (IIC):	Gallo, Mitchell
Additional Participating Persons:	Paul Sweeny; Federal Aviation Administration; Milwaukee, WI Tom Moody; Cessna Aircraft Company; Wichita, KS Robert Clayman; State of Wisconsin Department of Aviation; Madison, WI Robert Clark; State of Wisconsin Department of Natural Resources; Oshkosh, WI Rodney Martinez; Teledyne Continental Motors; Mobile, AL
Report Date:	March 25, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=73625