



Aviation Investigation Final Report

Location:	Captain Cook, Hawaii	Accident Number:	WPR10FA211
Date & Time:	April 21, 2010, 09:36 Local	Registration:	N34TH
Aircraft:	AirBorne WindSport Edge XT-912-L	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight was an introductory flight lesson in a weight-shift-controlled aircraft. Witnesses reported that they observed the aircraft maneuver over the ocean and approach a 450-foot cliff at a 45-degree angle. As the aircraft came close to the cliff, it banked steeply away and rolled inverted. Witnesses reported hearing a loud “pop” and the wings folded around the fuselage (pod). The aircraft descended in a spiraling corkscrew-like manner before impacting the water. The aircraft immediately sank and was never recovered. The pilot likely exceeded the manufacturer’s operating limitations for the aircraft, which specifies a maximum pitch limit of 45 degrees and a maximum bank angle of 60 degrees. Positive flight load factors are limited to 4G and negative loads are prohibited; flight loads between positive 1G and 0G should be avoided. The pilot’s operating handbook cautioned that negative G maneuvers can never be conducted safely and stated that these maneuvers put the aircraft outside of the pilot’s control.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot’s intentional in-flight maneuvers that exceeded the structural limits of the aircraft, which resulted in structural failure of the wings.

Findings

Aircraft	Wing attach fittings (on fus) - Capability exceeded
Personnel issues	Incorrect action selection - Pilot

Factual Information

History of Flight

Maneuvering

Loss of control in flight (Defining event)

HISTORY OF FLIGHT

On April 21, 2010, about 0936 Hawaiian standard time, an AirBorne WindSport Edge XT-912-L weight-shift-control light sport aircraft, N34TH, was substantially damaged when it impacted the water of Kealahou Bay near Captain Cook, Hawaii. The light-sport pilot and his student sustained fatal injuries. The pilot was doing business as Tedd's Flying Adventures and operating the aircraft under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the instructional flight. A flight plan had not been filed. The aircraft departed from Kona International Airport, Kailua Kona, Hawaii, at 0912.

According to Federal Aviation Administration Air Traffic Control personnel, the accident aircraft made its first departure for the day at 0748 and returned at 0814. The passenger on the second (accident) flight had flown with the pilot once before; this ride was given to her as a birthday gift.

According to witnesses, the aircraft was maneuvering near a 450-foot-tall cliff, which descended directly into the ocean. Several witnesses estimated that the aircraft was between 300 and 400 feet above the water; one witness estimated that it was only about 100 feet above the water. The aircraft approached the cliff flying on a northwesterly heading and about a 45-degree intercept to the cliff. As it flew very close to the cliff, it banked left and "flipped over." The witnesses heard a loud popping sound, the wings folded around the fuselage (pod) and the aircraft descended in a spiraling corkscrew-like manner. One witness said that it looked "like a butterfly landing on a flower." The aircraft impacted the surface of the bay about 100 to 300 feet from the base of the cliff and sank immediately.

There were several snorkel tour boats in the area and two of the snorkel tour guides dove into the gasoline covered water. They recovered the two occupants, and the boats took the occupants to a boat ramp about a mile away where Fire and Rescue personnel took over.

PERSONNEL INFORMATION

The 38-year-old pilot held a private pilot certificate with an airplane single engine land rating obtained in December 2002, and a light sport pilot certificate with a weight-shift-control rating obtained in March 2009. He became an instructor in weight-shift-control aircraft 8 months later on November 1, 2009. At the time of the accident, his pilot logbook and other records indicate that he had 375 hours of total flight time.

AIRCRAFT INFORMATION

The single-engine (pusher), propeller-driven, two seat (in line) weight-shift-control aircraft was manufactured by AirBorne WindSports Pty. Ltd., Redhead, New South Wales, Australia, in October 2009. Its maximum takeoff gross weight was 992 pounds. It was powered by a Rotax 912 UL four-stroke engine, which had a maximum output of 80 horsepower. This two seat design had a pilot-passenger "pod" suspended by a triangular frame, hinged below a strutted wing, which permitted weight shift control of pitch and roll axes. It was equipped with dual flight controls.

The manufacturer of the aircraft had published a Pilot's Operating Handbook (POH), which included Operational Limits for the aircraft. This section included the following statement concerning maneuvering limits:

"All aerobatic maneuvers including spinning is prohibited.

Aerobatic maneuvers including whipstalls, stalled spiral descents and negative G maneuvers are not permitted. It must be emphasized that a whipstall, spiral descent or negative G maneuvers can never be conducted safely. These maneuvers put the aircraft outside the pilots control and put both the aircraft and its occupants in extreme danger.

Do not pitch nose up or nose down more than 45 degrees from the horizontal. The front support tube of the trike [aircraft] and the pilot's chest limits the fore and aft movement of the control bar respectively.

BANK ANGLE

Do not exceed 60 degrees of bank angle. In roll there is no stop for the control movement. For the purpose of pre-flight freedom, check by lowering each wing to within 10 cm of the ground (on ground level)."

Additionally, the POH stated that flight load factors are limited to 4.0 "G" positive, load factors from 1.0 "G" positive to 0.0 "G" should be avoided, and any negative loads (less than 0.0 "G") are prohibited.

The U.S. representative for AirBorne WindSports stated that he assembled the aircraft in Hawaii for the owner. He said the aircraft came with the necessary hardware to mount a recovery parachute, but the pilot/owner asked him to leave the hardware off. The representative also stated that he never saw an aircraft parachute amongst the pilot/owner's equipment.

Review of the website for Tedd's Flying Adventures indicated that it stated that the aircraft was equipped with a recovery parachute; however, the photos of the aircraft displayed on the website show that a parachute was not installed. Passengers in the aircraft were provided with a helmet/headset combination with noise canceling capabilities, which provided communication between the two occupants. Each occupant was provided with an automatic inflatable personal flotation device.

According to the aircraft's maintenance records, the last 100-hour maintenance inspection was completed on April 9, 2010, at an aircraft total time of 100 hours.

METEOROLOGICAL INFORMATION

At 0953, the reported weather conditions at Kona International Airport (elevation 47 feet), Kailua Kona, located 17 nautical miles north of the accident site were: wind from 270 degrees at 6 knots; visibility 10 statute miles; clear of clouds; temperature 77 degrees Fahrenheit; dew point 61 degrees Fahrenheit; altimeter setting 30.09 inches of Mercury. The captain of one of the snorkel tour boats, who witnessed the accident, stated that the weather was sunny, the ocean was very calm, and the wind was less than 5 knots.

WRECKAGE AND IMPACT INFORMATION

The initial impact of the aircraft was in the Pacific Ocean. The aircraft was never recovered.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was conducted by Pan Pacific Pathologists, LLC, at the Kona Community Hospital, Kealahou, Hawaii, on April 21, 2010.

The FAA's Civil Aeromedical Institute (CAMI), Oklahoma City, Oklahoma, performed toxicology tests on the pilot. According to CAMI's report, the pilot's blood was tested for carbon monoxide and cyanide with negative results. Additionally his vitreous fluid was tested for volatiles with negative results, and his urine was tested for drugs with negative results.

ADDITIONAL INFORMATION

According to Federal Aviation Administration regulations, Title 14: Aeronautics and Space, Part 91.327, Aircraft having a special airworthiness certificate in the light-sport category: Operating limitations.

- (a) No person may operate an aircraft that has a special airworthiness certificate in the light-sport category for compensation or hire except--
 - (1) To tow a glider or an unpowered ultralight vehicle in accordance with 91.309 of this chapter; or

(2)To conduct flight training.

Pilot Information

Certificate:	Private; Sport Pilot	Age:	38, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	Sport pilot	Toxicology Performed:	Yes
Medical Certification:	Class 3 Without waivers/limitations	Last FAA Medical Exam:	December 27, 2007
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	January 18, 2009
Flight Time:	375 hours (Total, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AirBorne WindSport	Registration:	N34TH
Model/Series:	Edge XT-912-L	Aircraft Category:	Weight-shift
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Special light-sport (Special)	Serial Number:	XT-912-0335
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	April 9, 2010 Condition	Certified Max Gross Wt.:	992 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	100 Hrs as of last inspection	Engine Manufacturer:	Rotax
ELT:	Not installed	Engine Model/Series:	912 UL
Registered Owner:	Tedd R. Hecklin	Rated Power:	81 Horsepower
Operator:	Tedd R. Hecklin	Operating Certificate(s) Held:	None
Operator Does Business As:	Tedd's Flying Adventures	Operator Designator Code:	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KOA,47 ft msl	Distance from Accident Site:	17 Nautical Miles
Observation Time:	08:53 Local	Direction from Accident Site:	340°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	6 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:	270°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.09 inches Hg	Temperature/Dew Point:	25°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Kailua Kona, HI (KOA)	Type of Flight Plan Filed:	None
Destination:	Kailua Kona, HI (KOA)	Type of Clearance:	None
Departure Time:	09:16 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	19.481666,-155.929992(est)

Administrative Information

Investigator In Charge (IIC):	Struhsaker, James
Additional Participating Persons:	Jeffrey S Penna; FAA FSDO; Honolulu, HI
Original Publish Date:	November 29, 2011
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=75817

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).