National Transportation Safety Board
Aviation Accident Data Summary

Location:	Sisters, OR	**Accident Number:**	WPR13LA396
Date & Time:	09/01/2013, 1800 PDT	**Registration:**	N102HA
Aircraft:	FLIGHT DESIGN GMBH CTSW	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The sport pilot was conducting a cross-country flight in the light-sport airplane, and he reported that he encountered strong headwinds during the flight. Concerned that the airplane's fuel level may be low, he landed at a private airstrip a few miles before his intended destination. He checked the fuel levels and estimated that there was enough fuel for about 30 minutes of flight. He chose to depart, and a few minutes after takeoff, the engine lost all power. He performed a forced landing into a field just short of the destination airport. The airplane sustained substantial damage during the accident sequence, and the pilot was not injured. Immediately following the accident, the pilot reported that the airplane did not have any mechanical malfunctions and that it ran out of fuel. Postaccident examination did not reveal any evidence of a preimpact engine malfunction or failure. Both fuel tanks were found intact and did not appear to be breached. The airplane's fuel system appeared to meet the light-sport airplane industry design standards for usable fuel, which are similar to the Federal Aviation Administration standards for certified aircraft.

The pilot did not respond directly to multiple requests from the National Transportation Safety Board investigator-in-charge to answer questions regarding the specific accident circumstances. Therefore, the accident conditions could not be fully established. However, the pilot did provide multiple written declarations regarding the quantity of fuel on board at the time of departure from the private airstrip; these reports stated that between 3 and 4.5 gallons of fuel were in the right tank and that no fuel was in the left tank. However, only 1 gallon of fuel was recovered from the right wing tank, and the left tank was found empty, which was well below the Federal Aviation Regulations (FARs) minimum fuel requirements for flight, which state that "no person may begin a flight under visual flight rules conditions unless there is enough fuel to fly to the first point of intended landing and...to fly after that for at least 30 minutes of flight." Regardless of the pilot's written estimates of the fuel onboard, as noted previously, in his initial statement, he indicated that the airplane only had about enough fuel remaining for 30 minutes of flight, which was still not enough fuel to meet the FARs minimum fuel requirements, and, therefore, his decision to take off at that time was improper.

The design of the airplane's wing resulted in both the fuel sight gauge and the dipstick being prone to significantly misrepresenting the actual fuel quantity when the airplane was not level. Therefore, it is possible that the pilot misinterpreted the actual fuel quantity before takeoff. In addition, he exhibited poor decision-making by failing to land earlier in the flight for fuel even though he overflew at least four airports that had fueling facilities. The pilot appeared to have accrued almost 300 hours of flight experience in the airplane since he purchased it about 2 1/2 years earlier. Therefore, he should have had adequate knowledge about its systems and performance capabilities and known that the dipstick and sight gauge were prone to errors and that the airplane would need more fuel to complete the flight.

A similar accident in the United Kingdom (UK) resulted in the airplane's UK type certificate holder issuing a service bulletin (SB) that recommended that both sight gauges show fuel in flight and that a

landing be performed if any gauge reads empty. The SB also warned that, with one tank empty, the flight can continue provided no turbulence is encountered and the airplane is not flown in a sideslip condition such that fuel moves away from the tank outlet. The airplane's US distributor has not issued an SB regarding flight with one fuel tank empty, and this issue is not addressed in any placards or aircraft operation manuals; therefore, it is possible that the pilot did not realize the limitations of flying the airplane with one fuel tank empty.

Flight Events

Enroute-cruise - Fuel exhaustion
Enroute-cruise - Loss of engine power (total)
Landing - Off-field or emergency landing
Landing-flare/touchdown - Collision with terr/obj (non-CFIT)

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate preflight fuel planning and poor decision-making, which resulted in fuel exhaustion and the subsequent loss of engine power. Contributing to the accident was the lack of documentation describing the limitations of the airplane's fuel system.

Findings

Aircraft-Fluids/misc hardware-Fluids-Fuel-Fluid level - C
Personnel issues-Task performance-Planning/preparation-Fuel planning-Pilot - C
Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Pilot - C
Organizational issues-Development-Design-Design of document/info-Manufacturer

Pilot Information

Certificate:	Sport Pilot	**Age:**	63
Airplane Rating(s):	Single-engine Land	**Instrument Rating(s):**	None
Other Aircraft Rating(s):	None	**Instructor Rating(s):**	None
Flight Time:	(Estimated) 300 hours (Total, all aircraft), 300 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	FLIGHT DESIGN GMBH	**Registration:**	N102HA
Model/Series:	CTSW	**Engines:**	1 Reciprocating
Operator:	On file	**Engine Manufacturer:**	ROTAX
Air Carrier Operating Certificate:	None	**Engine Model/Series:**	912ULS
Flight Conducted Under:	Part 91: General Aviation - Personal		

Meteorological Information and Flight Plan

Observation Facility, Elevation:	RDM, 3080 ft msl	**Weather Information Source:**	Weather Observation Facility
Conditions at Accident Site:	Visual Conditions	**Lowest Ceiling:**	None
Condition of Light:	Day	**Wind Speed/Gusts, Direction:**	6 knots, 330°
Temperature:	33°C / 2°C	**Visibility**	10 Miles
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Sisters, OR (OR34)	**Destination:**	Sisters, OR (6K5)

Airport Information

Airport:	SISTERS EAGLE AIR (6K5)	**Runway Surface Type:**	N/A
Runway Used:	N/A	**Runway Surface Condition:**	Dry
Runway Length/Width:			

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None

Administrative Information

Investigator In Charge (IIC):	Eliott Simpson	**Adopted Date:**	05/13/2015
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=87946		