Aviation Investigation Final Report

Location:	Watertown, Wisconsin	**Accident Number:**	CEN16LA069
Date & Time:	December 27, 2015, 16:56 Local	**Registration:**	N5PF
Aircraft:	CIRRUS DESIGN CORP SR22	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot had spent several hours flying practice instrument approaches to various airports. He stated that he became distracted and failed to monitor the airplane's fuel state. His normal habit was to alternate between the airplane's wing fuel tanks every 30 minutes; however, he did not perform this action during the last hour of the accident flight. Shortly after takeoff to return to his home airport in night visual meteorological conditions, the airplane's engine experienced a total loss of power. The pilot turned back toward the departure airport, but the airplane did not have sufficient altitude to complete a power-off glide to the runway. The pilot stated that he did not switch the airplane's fuel selector following the loss of engine power. About 344 ft above ground level, the pilot activated the airplane's airframe parachute system. The low-altitude activation resulted in an incomplete deployment of the parachute and a nose-down impact with the ground, during which the pilot sustained serious injury.

The pilot stated that there were no mechanical malfunctions or anomalies that would have precluded normal operation of the airplane. Postaccident examination revealed that the airplane's fuel system was intact. The right wing tank, which was selected, contained about 21 oz of fuel, and the left wing tank contained about 22 gallons. Therefore, the total loss of engine power was consistent with fuel starvation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's improper in-flight fuel management, which resulted in a total loss of engine power due to fuel starvation. Contributing to the accident was the pilot's failure to switch fuel tanks after the engine lost power, and his delayed decision to activate the airframe parachute system, which resulted in his

serious injury due to incomplete deployment of the system and the airplane's improper attitude upon touchdown.

Findings

Aircraft	(general) - Unintentional use/operation
Personnel issues	(general) - Pilot
Personnel issues	Use of checklist - Pilot
Personnel issues	Use of equip/system - Pilot

Factual Information

History of Flight

Enroute	Loss of engine power (total) (Defining event)
Other	Collision with terr/obj (non-CFIT)

On December 27, 2015, about 1656 central standard time, a Cirrus SR22 airplane, N5PF, was substantially damaged during ground impact after departing from the Watertown Municipal Airport (RYV), Watertown, Wisconsin. The pilot, the sole occupant, sustained serious injuries. The airplane was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Night visual meteorological conditions prevailed for the flight, which was on an instrument flight rules (IFR) flight plan with a planned destination of Kenosha Regional Airport (ENW), Kenosha, Wisconsin.

The pilot flew multiple instrument approaches at various airports prior to his departure from RYV. Recorded data showed that about 4 minutes after departing RYV, the engine began to surge and subsequently lost power. The pilot attempted unsuccessfully to regain engine power and turned back to RYV. After recognizing his altitude was insufficient to glide to RYV, and with concerns of a forced landing in night conditions, the pilot deployed the Cirrus Airframe Parachute System (CAPS). The fuselage was subsequently damaged during a nose down impact with the ground.

Examination of the airplane revealed that the fuel system, from the fuel selector to the fuel tanks, remained intact, with no breaches noted. Twenty-one ounces of fuel were recovered from the right fuel tank system and the fuel selector was in the right tank position. The left fuel tank system contained about 22 gallons of fuel. The electric boost pump was connected to a battery and operated normally. No pre-accident anomalies were noted with the engine or engine-related components.

The airplane's non-volatile data was downloaded for the accident flight, which revealed that during the last departure climb, fuel pressure dropped, followed by a short rise in exhaust gas temperature (EGT) that rapidly decreased to zero. Fuel flow during the departure climb was about 30 gallons per hour (gph), before dropping and fluctuating between 1.5 and 11.5 gph for the last two minutes of the flight.

Rocket extraction of the parachute from its enclosure to full line stretch typically takes about 1-2 seconds and complete parachute inflation typically takes about 4-6 seconds from initial activation. The accident airplane's reefing line cutters were designed to fire 8 seconds after the parachute extraction activates them. Once the reefing line cutters fire, the rear harness "unsnubs" (lengthens), which lowers the tail of the airplane into its optimized landing attitude.

The accident airplane's rear harness was found snubbed and still folded, with tack stitching present. The reefing line cutters were present in their Velcro enclosure and expended, which was consistent with the reefing line cutters firing after touchdown of the airplane.

The airplane's non-volatile data was examined to estimate the CAPS deployment height. Based on a review of the airplane's longitudinal deceleration, indicated airspeed, pitch attitudes, and altitudes, CAPS activation was estimated to have occurred about 344 feet agl. CAPS activation at this altitude and descent profile was consistent with the incomplete CAPS deployment and nose down ground impact found at the accident site.

Although the pilot's normal habit pattern was to alternate between fuel tanks every 30 minutes using the timer on the GPS, he became distracted and did not accomplish this action during the last hour of the accident flight. After the engine lost power, the pilot did not attempt to switch fuel tanks with the fuel selector, as directed by the Cirrus SR22 pilot operating handbook (POH) engine failure checklist. The pilot stated that his goal on future flights was a more regimented adherence to checklists and flows during distractions, as well as ingraining emergency procedures to muscle memory (e.g. switching fuel tanks with fuel selector).

The airplane was equipped with a fuel caution light that illuminates if the fuel quantity in both fuel tanks falls below 14 gallons; the caution light does not illuminate if one tank is low (or empty) and the other tank contains greater than 14 gallons of fuel.

Pilot Information

Certificate:	Private	**Age:**	67,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	December 20, 2014
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 30, 2015
Flight Time:	2871 hours (Total, all aircraft), 1647 hours (Total, this make and model), 2765 hours (Pilot In Command, all aircraft), 17 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CIRRUS DESIGN CORP	**Registration:**	N5PF
Model/Series:	SR22	**Aircraft Category:**	Airplane
Year of Manufacture:	2006	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	1904
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 14, 2015 Annual	**Certified Max Gross Wt.:**	3400 lbs
Time Since Last Inspection:	17 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1540 Hrs at time of accident	**Engine Manufacturer:**	CONT MOTOR
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-550-N
Registered Owner:	On file	**Rated Power:**	310 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	KRYV,820 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	16:55 Local	**Direction from Accident Site:**	315°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Overcast / 2600 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	10°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.38 inches Hg	**Temperature/Dew Point:**	0°C / -4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	WATERTOWN, WI (RYV)	**Type of Flight Plan Filed:**	IFR
Destination:	KENOSHA, WI (ENW)	**Type of Clearance:**	IFR
Departure Time:	16:50 Local	**Type of Airspace:**	Class E

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	43.122501,-88.656669(est)

Administrative Information

Investigator In Charge (IIC):	Folkerts, Michael
Additional Participating Persons:	Ronald Polomoscanik; Flight Standards District Office; Milwaukee, WI Nicole Charnon; Continental Motors; Mobile, AL Brad Miller; Cirrus Aircraft; Duluth, MN
Original Publish Date:	June 20, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=92499