Aviation Investigation Final Report

Location:	Brinnon, Washington	**Accident Number:**	WPR17LA084
Date & Time:	April 2, 2017, 15:28 Local	**Registration:**	N167CB
Aircraft:	CIRRUS DESIGN CORP SR22	**Aircraft Damage:**	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	2 Serious
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor and student pilot departed on a planned 3-hour instructional flight. While en route, the flight instructor stated that he wanted to show the student that there was more to flying than just training and that flying was also "fun." The pilots subsequently turned the airplane toward a large river valley in mountainous terrain. The pilots flew into an area of rapidly rising terrain and realized they needed to climb to avoid terrain. The flight instructor applied full power and pitched the airplane up into a climb; however, the terrain rose faster than the airplane was climbing. The flight instructor instructed the student pilot to start a right turn. Shortly thereafter, he felt the turn was too slow, and he took control of the airplane. The flight instructor stated that things were happening too fast for him to recover the airplane. The airplane subsequently impacted terrain in a box canyon, with ridgelines between 100 feet to several hundred feet higher than the accident site. Postaccident examination of the airframe and engine revealed no mechanical malfunctions or failures that would have precluded normal operation.

Probable Cause and Findings

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

The flight instructor's decision to fly into a valley without ensuring adequate clearance to avoid the rising terrain.

Findings

Personnel issues	Decision making/judgment - Instructor/check pilot
Aircraft	Altitude - Not attained/maintained
Environmental issues	Mountainous/hilly terrain - Ability to respond/compensate

Factual Information

History of Flight

Maneuvering	Controlled flight into terr/obj (CFIT) (Defining event)

On April 2, 2017, about 1528 Pacific daylight time, a Cirrus Design Corporation SR22, airplane, N167CB, was substantially damaged when it impacted mountainous terrain near Brinnon, Washington. The flight instructor and the student pilot sustained serious injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The cross country flight departed from Whidbey Air Park (W10), Langley, Washington, about 1500 with a planned destination of Bremerton National Airport (PWT), Bremerton, Washington.

According to the flight instructor, they had planned a 3-hour instructional flight and planned to accomplish their traffic pattern work at PWT. While enroute, the flight instructor stated that he wanted to show the student that there was more to flying than just training. In his words flying was also "fun." Subsequently, the airplane was turned west towards a large valley in the Olympic Mountain range. While flying in the valley, the flight instructor stated that he believed their altitude was at least 2,000 ft above ground level (agl) and that no wind or turbulence was present. However, at some point, the pilots realized they needed to climb to avoid terrain and the flight instructor applied full power and pitched the airplane up into a climb. However, he realized that even with these control inputs, the terrain was rising faster than the airplane was climbing. The flight instructor instructed the student pilot to start a right turn. Shortly thereafter, he felt the turn was too slow and just as the student pilot was increasing the bank of the turn, he took control of the airplane. The flight instructor stated that things were happening too fast for him to recover the airplane and he knew that they were going to crash. Subsequently, the airplane impacted terrain.

The accident airplane was equipped with an Avidyne Primary Flight Display that contained two flash memory devices. The flash memodevices were recovered from the accident airplane and sent to the National Transportation Safety Board's Vehicle Recorder laboratory for download. The downloaded files captured the accident flight.

The data started with the airplane flying southwest over Puget Sound, about 1,700 ft mean sea level (msl). At 1518, the airplane turned left to a south-southwesterly heading. At 1520, the airplane turned to the west and crossed the shoreline north of Brinnon, Washington. The airplane then flew along the Dosewallips river valley, about 1,600 ft msl. At 1523, the airplane began a climb and at 1526, the airplane's altitude indicated about 2,407 ft msl. The airplane then turned left to fly along the Hungry Creek valley; however, the terrain continued to rapidly rise in height. Subsequently, at 1528, the data was consistent with the airplane impacting terrain, near 5,400 ft msl. The accident site was in a box canyon with ridgelines present in front and on each side of it, that were between 100 ft to several hundred ft higher in elevation, than the accident site. Further, the terrain at the accident site, was about 2,000 ft higher in elevation, than that of the river valley that was about 1.5 miles below it.

No anomalies in the recorded data from the accident flight would have precluded the normal operation of the airplane. The last recorded information before impact, indicated the engine was at 2,620 rpm, the airplane in about 29° of right bank, and an indicated ground speed of about 81 knots.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	25,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	February 3, 2016
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 22, 2016
Flight Time:	(Estimated) 1400 hours (Total, all aircraft), 26 hours (Total, this make and model), 1100 hours (Pilot In Command, all aircraft), 70 hours (Last 90 days, all aircraft), 35 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	Student	**Age:**	36,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 5 hours (Total, all aircraft), 5 hours (Total, this make and model), 5 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

The flight instructor held a commercial pilot certificate with ratings for airplane single-engine land and rotorcraft. He also held ratings for an instrument airplane and instructor single-engine airplane. The pilot was issued a Federal Aviation Administration (FAA) second class airman medical certificate on February 3, 2016, with no limitations or waivers.

The flight instructor reported that he had accumulated 1,400 total hours of flight experience and had logged 70 flight hours in the previous 3 months and 35 flight hours in the previous 30 days. About 26 flight hours and 10 instructor hours were accumulated in the accident airplane make and model. He also reported that he had hundreds of hours experience flying in mountainous terrain.

The flight instructor had recently been hired by the operator and spent the prior week in their standardization training. A review of the operator's training logbooks indicated that the accident flight instructor took 5 training flights and logged 10.2 flight hours in the Cirrus SR22 airplane during his

training. Four of the flights were cross country flights. Additionally, 7.6 hours of ground training was accomplished.

The student pilot held a student pilot certificate. The student pilot was issued a Federal Aviation Administration (FAA) third-class airman medical certificate on May 11, 2016, with the limitation that he must wear corrective lenses. The student pilot reported he had accumulated 5 hours of flight experience. The was his third instruction flight.

Aircraft and Owner/Operator Information

Aircraft Make:	CIRRUS DESIGN CORP	**Registration:**	N167CB
Model/Series:	SR22 NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:	2004	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	0822
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	July 31, 2016 Annual	**Certified Max Gross Wt.:**	3400 lbs
Time Since Last Inspection:	25 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	841.6 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	C126 installed, activated, aided in locating accident	**Engine Model/Series:**	IO-550 N (27)
Registered Owner:	BOUDJAKDJI CHERIF	**Rated Power:**	310 Horsepower
Operator:	The Flight Academy	**Operating Certificate(s) Held:**	None

The low-wing airplane was manufactured in 2004. It was powered by a 310 horsepower Continental IO-550 series engine that drove a three-bladed Hartzell constant speed propeller.

A review of maintenance logbooks revealed that the airplane's most recent annual inspection was completed on July 30, 2016, at a Hobbs time of 841.6 hours. The flight meter read 557.1 hours at the accident scene; the Hobbs meter read 1,082.4 hours at the accident site.

The Pilot's Operating Handbook listed the airplane's rate of climb at 6,000 ft pressure altitude and 98 KIAS to be about 1,046 ft per minute at 0° C.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSHN,271 ft msl	**Distance from Accident Site:**	32 Nautical Miles
Observation Time:	22:53 Local	**Direction from Accident Site:**	149°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	17 knots / 26 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	250°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.25 inches Hg	**Temperature/Dew Point:**	12°C / 1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	LANGLEY, WA (W10)	**Type of Flight Plan Filed:**	None
Destination:	BREMERTON, WA (PWT)	**Type of Clearance:**	None
Departure Time:	15:00 Local	**Type of Airspace:**	Class G

The closest official weather reporting location to the accident site was PWT, located about 25 miles southeast of the accident site. However, due to unknown reasons, the PWT station was off line the day of the accident.

The next closest official weather reporting station was from William R. Fairchild International Airport (CLM), Port Angeles, Washington, located about 32 miles north-northwest of the accident site. The CLM weather observation at 1453, was wind from 310° at 9 knots, visibility unrestricted at 10 miles or more, few clouds at 3,100 ft ceiling broken at 4,000 ft, overcast at 6,500 ft, temperature 8° C, dew point 4° C, and altimeter 30.31 inches of mercury.

A review of the weather information revealed that no significant weather was reported or forecast in the accident area around the time of the accident. A high-pressure system was located off the northwest pacific coast. The local weather surveillance radars for the 1 hour period before the accident time, detected no significant weather echoes over the area for that period.

The wind speed near the accident area around the time of the accident was estimated to be from the northwest about 11 knots from the surface to about 2,000 ft msl, with little directional variation with height and with winds increasing with height. At 6,300, ft the approximate height of Mount Christie, located about 13 miles west of the accident site, the wind was from 305° magnetic at 16 knots, and would have resulted in a downslope wind over the accident site.

A turbulence model indicated that above the surface, about 700 ft, there was a strong vertical shear of about 8.1 knots per 1,000 ft, and a high probability of moderate turbulence. No defined mountain wave or orographic type clouds were identified from the period between one hour prior, and one hour after, the accident time.

An AIRMET, valid at the time of the accident, was issued for mountain obscuration, occasional

moderate turbulence below 15,000 ft, and icing conditions between 2,000 and 12,000 ft in clouds and precipitation was current in the area at the time of the accident.

Wreckage and Impact Information

Crew Injuries:	2 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious	**Latitude, Longitude:**	47.692222,-123.221946(est)

The airplane impacted on a mountainous slope of about 45° and came to rest upright. The airplane wreckage showed that the airplane was in a right turn during impact. All major components of the airplane were located at the site. The accident site was located about 13 miles east from the summit of Mount Christie, in snow packed mountainous terrain. Mount Christie is the high peak of the Olympic mountains, in the Olympic State Park in Washington.

A postaccident examination of the airframe and engine did not reveal any anomalies with the airframe or engine that would have precluded normal operation. The Cirrus Aircraft Parachute System was not activated.

Additional Information

The FAA's Aviation Safety Program publication "Tips on Mountain Flying," section on ridge and pass crossing, states that "experienced pilots recommend crossing a ridge line or pass, at the ridge elevation plus at least 1,000 ft. The publication also states, "plan to be at that altitude at least three miles before reaching the ridge."

The airplane's turn performance was evaluated using a performance chart from the Aerodynamics for Naval Aviators, NAVAIR 00-08T-80 publication. Based on 30° of bank, the performance chart indicated that the accident airplane would have about an 1,500 ft turn radius. A review of the accident area indicated only about 1,000 ft between the higher terrain on each side of the airplane, was available to complete a turn away from the high terrain in front of the airplane. Additionally, during the first half of the turn, the terrain continued to rise.

Administrative Information

Investigator In Charge (IIC):	Nixon, Albert
Additional Participating Persons:	Donald Bacon; Federal Aviation Administration; Renton, WA Michael Council; Continental Motors Inc.; Mobile, AL Brannon Mayer; Cirrus Aircraft; Duluth, MN
Original Publish Date:	August 10, 2020
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=94961