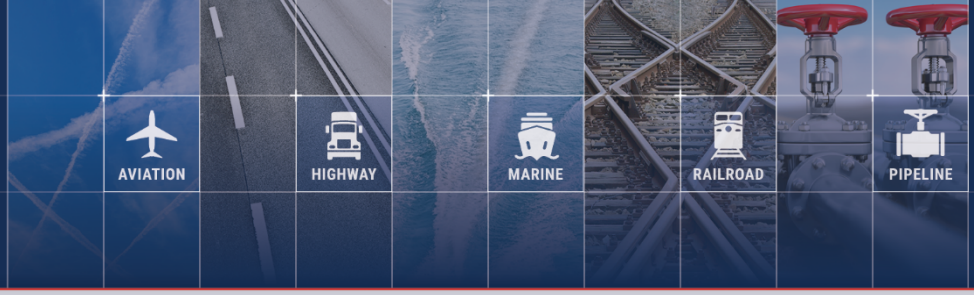

Aviation Investigation Final Report

Location:	Santa Ana, California	**Accident Number:**	WPR18FA211
Date & Time:	August 5, 2018, 12:29 Local	**Registration:**	N727RP
Aircraft:	Cessna 414	**Aircraft Damage:**	Destroyed
Defining Event:	Aerodynamic stall/spin	**Injuries:**	5 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

The pilot and four passengers were nearing the completion of a cross-county business flight. While maneuvering in the traffic pattern at the destination airport, the controller asked the pilot if he could accept a shorter runway. The pilot said he could not, so he was instructed to enter a holding pattern for sequencing; less than a minute later, the pilot said he could accept the shorter runway. He was instructed to conduct a left 270° turn to enter the traffic pattern. The pilot initiated a left bank turn and then several seconds later the bank increased, and the airplane subsequently entered a steep nose-down descent. The airplane impacted a shopping center parking lot about 1.6 miles from the destination airport.

A review of the airplane's flight data revealed that, shortly after entering the left turn, and as the airplane’s bank increased, its airspeed decreased to about 59 knots, which was well below the manufacturer’s published stall speed in any configuration.

Postaccident examination of the airframe and engines revealed no anomalies that would have precluded normal operation. It is likely that the pilot failed to maintain airspeed during the turn, which resulted in an exceedance of the aircraft's critical angle of attack and an aerodynamic stall.

Probable Cause and Findings

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

The pilot’s failure to maintain adequate airspeed while maneuvering in the traffic pattern which resulted in an aerodynamic stall and subsequent spin at a low altitude, which the pilot was unable to recover from.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	Airspeed - Not attained/maintained
Aircraft	Angle of attack - Capability exceeded

Factual Information

History of Flight

Maneuvering-low-alt flying	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On August 5, 2018, about 1229 Pacific daylight time, a Cessna 414 airplane, N727RP, was destroyed when it was involved in an accident near Santa Ana, California. The pilot and four passengers were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 business flight.

A review of the John Wayne-Orange County Control Tower (SNA) Air Traffic Control Tower (ATCT) audio revealed that the pilot contacted SNA tower at 1225, and reported the airplane was at an altitude of 1,700 ft. The controller instructed the pilot to make right traffic for runway 20R. The pilot acknowledged the instruction and the controller then asked the pilot if he could accept runway 20L and informed him the runway was 2,850 ft long. The pilot responded that he was unable to land on runway 20L. Subsequently, the pilot was instructed to hold over the South Coast Plaza, a local VFR holding point, and to conduct left 360° turns for sequencing. Less than a minute after denying the original response to land on runway 20L, the pilot responded that he could accept runway 20L for landing. The controller then instructed the pilot to accomplish a left 270° turn and cross directly over the tower at or above 1,300 ft, for left traffic to runway 20L. The pilot acknowledged the instruction.

About 23 seconds later, the controller instructed the pilot to "climb back up to 1,300 ft or above." Four seconds after the instruction the pilot stated, "emergency, emergency, emergency." A review of audio transcripts, flight data, and a discussion with an ATCT who witnessed the event, were all consistent with the pilot's emergency transmissions being made during the start of the steep nose-down descent. No further transmissions were received by the pilot.

A review of flight data provided by the airplane's Appareo Stratus 2S ADS-B device showed at 1929:10 (all times given as Coordinated Universal Time (UTC), the airplane was at 96 knots and an altitude of 960 ft msl. Shortly thereafter, the airplane began a left turn. Initially, the airplane's left bank increased to about 15°; about 10 seconds later, the left bank increased to about 30°. At 1929:15, the airspeed was 91 knots, and the altitude was 955 ft msl. At 1929:20, the airspeed was 85 knots and the altitude was 950 ft msl. The airplane continued the left turn and at 1929:25, the airspeed was 73 knots, the altitude was 894 ft msl, and the roll rate was increased to over 40° of bank; over the next few seconds, the bank increased to nearly 90°. The airplane began to descend, and the vertical speed was about -1200 ft per min (fpm). From this time forward, the airplane's descent rate increased rapidly. At 1929:27, the airspeed was 62 knots, the altitude was 765 ft msl, and the vertical speed was about -2,300 fpm. At 1929:30, the airspeed was 66 knots, the altitude had decreased to 499 ft msl, and the vertical speed was about -4,400 fpm. The last recorded data point was at 1929:33, when the airspeed was 59 knots, the altitude was 292 ft msl, and the vertical speed about -5,250 fpm.

Multiple witnesses, near the accident site, observed the airplane enter the left bank turn and shortly thereafter, they observed the bank increase and the airplane descend towards the ground at a steep angle. An Air Force pilot said that it looked “like the onset of a spin.” Another pilot holding on the taxiway at SNA, said that this “was the classic stall and spin.”

The airplane came to rest in a shopping mall parking lot and struck several vehicles before coming to rest upright about 35 ft from the entrance of a store.

Observation of online video of the accident airplane showed it in a steep vertical nose down descent, while rotating to the left.

Pilot Information

Certificate:	Private	**Age:**	53,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	October 20, 2017
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 980 hours (Total, all aircraft), 120 hours (Total, this make and model)		

Passenger Information

Certificate:		**Age:**	Female
Airplane Rating(s):		**Seat Occupied:**	Unknown
Other Aircraft Rating(s):		**Restraint Used:**	Unknown
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:	**Age:**	Female
Airplane Rating(s):	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	**Restraint Used:**	Unknown
Instrument Rating(s):	**Second Pilot Present:**	No
Instructor Rating(s):	**Toxicology Performed:**	No
Medical Certification:	**Last FAA Medical Exam:**	
Occupational Pilot:	**Last Flight Review or Equivalent:**	
Flight Time:		

Passenger Information

Certificate:	**Age:**	Male
Airplane Rating(s):	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	**Restraint Used:**	Unknown
Instrument Rating(s):	**Second Pilot Present:**	No
Instructor Rating(s):	**Toxicology Performed:**	No
Medical Certification:	**Last FAA Medical Exam:**	
Occupational Pilot:	**Last Flight Review or Equivalent:**	
Flight Time:		

Passenger Information

Certificate:	**Age:**	Female
Airplane Rating(s):	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	**Restraint Used:**	Unknown
Instrument Rating(s):	**Second Pilot Present:**	No
Instructor Rating(s):	**Toxicology Performed:**	No
Medical Certification:	**Last FAA Medical Exam:**	
Occupational Pilot:	**Last Flight Review or Equivalent:**	
Flight Time:		

The pilot began flying the accident airplane in January 2017. In the 6 months before the accident, the pilot flew the accident airplane on 14 flights (not including the accident flight) for a total flight time of about 43 hours.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N727RP
Model/Series:	414 Undesignat	**Aircraft Category:**	Airplane
Year of Manufacture:	1973	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	414-0385
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:	November 26, 2017 Annual	**Certified Max Gross Wt.:**	6350 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	3963.6 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	TSIO-520-NB
Registered Owner:		**Rated Power:**	325 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The airplane was modified in accordance with Supplemental Type Certificate (STC) SE4327SW, which allowed for operation of 325 horsepower at 38 inches manifold pressure at 2,700 rpm. The airplane was also modified IAW STC SA09971SC-D by installation of Hartzell three-bladed constant speed PHC-C3YF-2UF propellers.
Airplane Stall Speeds:

The airplane's Pilot's Owner's Manual (POH) listed the stall speeds. The speeds were listed in mph and were converted to knots for a better comparison with the flight data. At the gross weight of 6,350 pounds, with gear and flaps up, and no bank angle, the stall speed is 81 knots, at 20° of bank, 84 knots, at 40° of bank, 96 knots and at 60° of bank, 121 knots. With the gear extended, 15° of flaps, and no bank angle: the stall speed is at 80 knots, at 20° of bank, 83 knots, at 40° of bank, 91 knots, and at 60° of bank, 114 knots. (Note: The Airplane Flight Manual Supplement for the STC only listed stall speeds for a gross weight of 6,510 pounds. For stall speed at and below 6,350 pounds, the original Pilot's Operating Manual would be referenced).

The airplane's POH landing performance table indicated that the landing distance with wing flaps 45° would be sufficient for the use of runway 20L.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSNA,56 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	12:53 Local	**Direction from Accident Site:**	136°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.86 inches Hg	**Temperature/Dew Point:**	27°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Concord, CA (CCR)	**Type of Flight Plan Filed:**	None
Destination:	Santa Ana, CA (SNA)	**Type of Clearance:**	Unknown
Departure Time:	10:20 Local	**Type of Airspace:**	Class C

Airport Information

Airport:	JOHN WAYNE AIRPORT-ORANGE COUN SNA	**Runway Surface Type:**	Asphalt
Airport Elevation:	56 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	20L	**IFR Approach:**	None
Runway Length/Width:	2887 ft / 75 ft	**VFR Approach/Landing:**	Traffic pattern

Runway 20L was 2,887 ft long and 75 ft wide.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	4 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	5 Fatal	**Latitude, Longitude:**	33.696109,-117.884445(est)

The airplane impacted a parking lot about 1.6 miles northwest of SNA. The wreckage was contained within an approximate 150 ft debris trail. The first piece of identified wreckage was the left-wing tip

which was located about 90 ft from the main wreckage. The last piece of identified wreckage was the right-wing tip which was located about 60 ft from the main wreckage.

The initial impact point (IIP) was a depression in the asphalt. About 12 ft from this depression was a crater about 3 ft long, 2 ft wide and 6 inches deep. A propeller blade from the left engine was separated from the hub and found in the crater. Several left-wing fragments were found near the IIP. The aileron trim actuator, which was located in the left wing, separated from the wing upon impact, and was observed in the parking lot near the IIP. The aileron trim cables were observed separated, consistent with tension overload.

The main wreckage consisted of the fuselage, right engine, right wing, and empennage. The fuselage was slightly canted to the left. The empennage was mostly separated from the fuselage but remained attached by the control cables. The front of the aircraft and cabin area was destroyed during impact. The cabin door remained attached.

The inboard section of the left wing was separated from the fuselage at the wing root. Furthermore, the left engine, left flap and left main landing gear, remained attached to this inboard wing section.

The right wing remained partially attached to the fuselage. The right wing section outboard of the nacelle was separated and was found within the debris path. The right aileron remained attached at the inboard connection.

The right engine impacted into an unoccupied parked vehicle. The vehicle was then displaced by about 65 ft from its original location. The right propeller separated at the hub and was found inside the aft section of the vehicle. Additionally, a few other unoccupied vehicles were struck by the airplane debris.

The empennage remained partially attached to the fuselage. The vertical stabilizer remained attached to the empennage and was relatively intact. The rudder remained attached to the vertical stabilizer and the rudder trim was near the neutral position. The leading edge of the left horizontal stabilizer sustained impact damage. Both elevators remained attached to their respective horizontal stabilizer. The elevator trim was observed near the neutral position.

Flight control continuity was established from the cockpit area to each respective flight control surface, except for the left aileron, which had separated. Aileron flight control cable continuity was confirmed from the cockpit to the control surfaces bell crank through cable separations that exhibited tensile overload. Rudder and elevator flight control cable continuity was confirmed from the cockpit to the control surface bell cranks, through cable separations that exhibited either tensile overload or were cut by investigators to facilitate recovery.

Examination of the flap motor revealed that the left and right flap chains had 7.5 links from the sprocket, consistent with about a 10° flap setting.

The landing gear actuator was observed in the extended position. Brake assembly parts were observed in one of the impact craters. Additionally, impact markings and damage sustained to the main landing gear assemblies were consistent with the gear in the extended position.

The airplane was configured with the following fuel tanks: left and right main tanks (located at the wing tips), left and right auxiliary tanks (located in the wings outboard of the nacelles), and right wing locker (located in the right nacelle behind the engine).The left fuel selector handle was observed between the left main and left auxiliary tanks, and the right fuel selector handle was observed between the right main and right auxiliary tanks. The pointer tip of the left fuel handler selector was fractured. The left and right fuel selector cables were stretched during the separation of the wings outboard of the nacelles and the left and right control arms were pulled beyond the off position. The fuel selector valves were substantially damaged by impact and unable to be functionally tested. The only fuel tank not breached was the right auxiliary tank.

During the examination, about 2.5 gallons of fuel were drained from the tank. The fuel was observed to be blue in color and clear of contaminants. The airplane was refueled on the morning of the accident flight; the main tanks were topped off and the right auxiliary tank was not refueled since it was full, and the left auxiliary tank received about 15 gallons. The fuel load was sufficient for the flight.

Left Engine

Impact damage to Cylinder's Nos. 2, 4, and 6 were noted. Cylinder's Nos. 4 and 6 rocker box covers were separated. Manual rotation was attempted by using a hand tool but was unable to be accomplished. A borescope inspection of the cylinders revealed normal operational conditions. Both magnetos were separated from the engine but remained attached to the ignition harness. The magnetos sustained impact damage but when manually rotated, spark was observed at all leads. The oil sump sustained extensive crush damage. The top spark plugs were removed and exhibited normal worn out wear signatures when compared to the Champion Check-A-Plug comparison chart. The fuel flow divider lines were attached at all cylinder fuel injectors.

Examination of the fuel pump revealed no anomalies. The turbocharger remained attached to its respective housing. The turbocharger blades were observed bent.

Cylinder Nos. 1 and 3 were removed and eventually rotation was confirmed. The remaining cylinders were also removed, and the crankcase was disassembled. No thermal damage was observed, and all bearings displayed normal wear. The crankshaft and camshaft were also removed, and no anomalies were noted.

The oil filter was removed and cut open. The filter folds were clear of contamination.

Right Engine

The No. 6 cylinder sustained impact damage. The No. 6 rocker cover was separated. Both magnetos were separated from the engine but remained attached to their respective ignition harness. All spark plugs were removed and exhibited normal worn out wear signatures when compared to the Champion Check-A-Plug comparison chart. The fuel flow dividers lines remained attached at all cylinder fuel injectors. Examination of the fuel pump revealed no anomalies.

Both magnetos were manually rotated, and spark was observed at all leads. The turbocharger remained attached to its respective housing. The turbocharger blades were observed bent.

All six cylinders, crankshaft, and camshaft were removed, with no anomalies noted.

The oil filter was removed and cut open. The filter folds were clear of contamination.

The crankcase was disassembled, and no thermal damage was observed. The bearings displayed normal wear and no anomalies were noted.

Propeller examination

The propeller examination revealed that both propellers showed signs of rotation and there were no indications that either propeller was at or near the feathered position. Leading edge gouging, chordwise/rotational scoring, blade bending, and twisting were observed on both propellers, which is consistent with rotation. Overall, the damage to both the left and right propellers was similar and consistent with a power on, symmetric condition, at the time of impact.

Cockpit/Cabin Observations

The cockpit area sustained substantial impact damage and most instrumentation was damaged and unreadable. The throttles were near the idle/aft position and the mixture and propeller controls were full forward.

Postaccident examination of the airframe and engines revealed no preimpact mechanical malfunctions or failures that would have precluded normal operation.

Medical and Pathological Information

Orange County Sheriff-Coroner, Santa Ana, California, conducted an autopsy of the pilot. The pilot’s cause of death was multiple traumatic blunt force injuries.

Toxicology testing performed at the FAA's Forensic Sciences Laboratory was negative for carbon monoxide, ethanol, and drugs.

Administrative Information

Investigator In Charge (IIC):	Nixon, Albert
Additional Participating Persons:	Stephen Parrent; Federal Aviation Administration; Long Beach, CA Kurt Gibson; Continental Aerospace Technologies; Mobile, AL Peter Basile; Textron Aviation; Wichita, KS
Original Publish Date:	May 5, 2021 **Investigation Class:** 2
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97994