



Aviation Investigation Final Report

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| Location: | Tappahannock, Virginia | Accident Number: | ERA19FA251 |
| Date & Time: | August 19, 2019, 03:43 Local | Registration: | N621JE |
| Aircraft: | Cirrus SR22 | Aircraft Damage: | Substantial |
| Defining Event: | Fire/smoke (non-impact) | Injuries: | 1 Serious |
| Flight Conducted Under: | Part 91: General aviation - Personal | | |

Analysis

The pilot reported that, during a cross-country flight in night visual meteorological conditions, he noticed fumes in the cockpit upon reaching a cruise altitude of 3,500 ft mean sea level. He reported the fumes to air traffic control and diverted to the nearest airport. Shortly thereafter, he noticed smoke in the cockpit and attempted to land at the diversion airport, but the airplane was too high to land, and he performed a go-around. After the first landing attempt, he turned off the air conditioner and electrical system and attempted to land again but was unable to do so due to the darkness and smoke in the cockpit. He subsequently decided to deploy the airframe parachute system. The pilot did not recall anything else due to his injuries.

Examination of the wreckage and the airplane's non-volatile memory did not reveal any preimpact electrical or mechanical anomalies that would have resulted in smoke in the cabin; therefore, the reason for the reported fumes and smoke could not be determined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inability to land on the runway in dark night conditions with reported smoke in the cockpit, which necessitated the deployment of the airplane's parachute system.

Findings

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| Environmental issues | Air quality/dust/smoke - Effect on operation |
| Environmental issues | Air quality/dust/smoke - Decision related to condition |
| Environmental issues | Dark - Effect on operation |
| Personnel issues | Aircraft control - Pilot |

Factual Information

History of Flight

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| Enroute | Fire/smoke (non-impact) (Defining event) |
| Enroute | Miscellaneous/other |
| Emergency descent | Collision with terr/obj (non-CFIT) |

On August 19, 2019, about 0343 eastern daylight time, a Cirrus SR22, N621JE, was destroyed when it was involved in an accident near Tappahannock, Virginia. The pilot was seriously injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

The pilot departed Richmond International Airport (RIC), Richmond, Virginia, about 0327. According to radar and communication data from the Federal Aviation Administration (FAA), at 0335, the airplane was in cruise flight at 3,500 ft mean sea level (msl) when the pilot reported to air traffic control that he was diverting to Tappahannock Essex County Airport (XSA), Tappahannock, Virginia, due to an electrical smell in the cabin. The controller acknowledged the transmission and attempted to confirm that it was an electrical smell in the cabin, to which the pilot replied that he did not know what the smell was, but he was going to start a descent for XSA. At 0336, the pilot reported XSA in sight and the controller advised the pilot that he could switch radio frequencies to the common traffic advisory frequency for XSA, which the pilot acknowledged. No further radio communications were received from the accident airplane.

According to the pilot, he noticed smoke and attempted to land at XSA but performed a go-around because the airplane was too high to land. He then turned off the air conditioner and electrical system and attempted to land again, but it was dark and hard to see and breathe due to the smoke. At 0343, the pilot entered an emergency transponder code and the controller attempted to contact the pilot three times with no success. At that time, the airplane was at 600 ft msl and the airspeed began to decrease. The pilot deployed the Cirrus Airframe Parachute System (CAPS) and did not recall anything else except waking up in a hospital 3 days later.

Pilot Information

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| Certificate: | Private | Age: | 25, Male |
| Airplane Rating(s): | Single-engine land | Seat Occupied: | Left |
| Other Aircraft Rating(s): | None | Restraint Used: | 4-point |
| Instrument Rating(s): | None | Second Pilot Present: | No |
| Instructor Rating(s): | None | Toxicology Performed: | No |
| Medical Certification: | Class 1 Without waivers/limitations | Last FAA Medical Exam: | October 26, 2017 |
| Occupational Pilot: | No | Last Flight Review or Equivalent: | |
| Flight Time: | 330 hours (Total, all aircraft), 165 hours (Total, this make and model), 296 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 65 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft) | | |

The pilot's logbook was not recovered.

Aircraft and Owner/Operator Information

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| Aircraft Make: | Cirrus | Registration: | N621JE |
| Model/Series: | SR22 Undesignat | Aircraft Category: | Airplane |
| Year of Manufacture: | 2006 | Amateur Built: | |
| Airworthiness Certificate: | Normal | Serial Number: | 2168 |
| Landing Gear Type: | Tricycle | Seats: | 4 |
| Date/Type of Last Inspection: | April 1, 2019 Annual | Certified Max Gross Wt.: | 3600 lbs |
| Time Since Last Inspection: | 81 Hrs | Engines: | 1 Reciprocating |
| Airframe Total Time: | 614 Hrs as of last inspection | Engine Manufacturer: | Continental |
| ELT: | C91A installed, activated, aided in locating accident | Engine Model/Series: | IO-550 |
| Registered Owner: | CirrusSR22 LLC | Rated Power: | 310 Horsepower |
| Operator: | Trident Aircraft | Operating Certificate(s) Held: | Pilot school (141), Commercial space transp. experimental permit |

Meteorological Information and Flight Plan

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| Conditions at Accident Site: | Visual (VMC) | Condition of Light: | Night |
| Observation Facility, Elevation: | XSA,135 ft msl | Distance from Accident Site: | 1 Nautical Miles |
| Observation Time: | 03:35 Local | Direction from Accident Site: | 270° |
| Lowest Cloud Condition: | Clear | Visibility | 10 miles |
| Lowest Ceiling: | None | Visibility (RVR): | |
| Wind Speed/Gusts: | 3 knots / | Turbulence Type Forecast/Actual: | None / None |
| Wind Direction: | 230° | Turbulence Severity Forecast/Actual: | N/A / N/A |
| Altimeter Setting: | 29.97 inches Hg | Temperature/Dew Point: | 24°C / 24°C |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | Richmond, VA (RIC) | Type of Flight Plan Filed: | None |
| Destination: | Easton, MD (ESN) | Type of Clearance: | None |
| Departure Time: | 03:27 Local | Type of Airspace: | |

Airport Information

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| Airport: | Tappahannock-Essex County Airp XSA | Runway Surface Type: | |
| Airport Elevation: | 135 ft msl | Runway Surface Condition: | |
| Runway Used: | | IFR Approach: | None |
| Runway Length/Width: | | VFR Approach/Landing: | None |

Wreckage and Impact Information

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| Crew Injuries: | 1 Serious | Aircraft Damage: | Substantial |
| Passenger Injuries: | | Aircraft Fire: | Unknown |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 1 Serious | Latitude, Longitude: | 37.86,-76.884719 |

The wreckage was located in swampy terrain at the bottom of a ravine about 600 ft from the approach end of runway 28 at XSA. It came to rest in a near-vertical, nose-down position in deep mud. The empennage had separated from the airplane; there was no damage to the vertical stabilizer, horizontal stabilizer, rudder, or elevator. The deployed CAPS parachute remained attached to the airframe. The entire wing structure remained intact but had separated from the fuselage. The left wing exhibited

leading edge impact damage. The right wing was fractured outboard of the outer aileron attach point. The left fuel tank was breached while the right fuel tank remained intact and contained fuel. The wing flaps and ailerons remained attached; the flaps were in the fully-extended position.

The nose section remained buried in mud and water up to the instrument panel. The pilot's four-point harness was cut by rescue personnel. Initial examination of the primary flight display (PFD), multifunction display (MFD), integrated flight display, autopilot unit, circuit panel, switch panel, and their associated wires did not reveal any evidence of electrical arcing or burning. A data card from the Avidyne MFD and the Avidyne DFC-90 autopilot unit were retained and forwarded to the National Transportation Safety Board Vehicle Recorders Laboratory, Washington, DC, for data download. The wreckage was retained for further examination.

The airframe and engine were examined again at a recovery facility by the National Transportation Safety Board (NTSB) investigator, an NTSB Fire & Explosion Specialist, and an investigator from the airframe manufacturer.

None of the wires in the instrument panel or on the engine exhibited any chafing, sooting, melting or evidence of electrical arcing. The PFD, MFD, Avidyne 540, Avidyne 440, blower motor, avionics cooling fan, XM receiver, enhanced ground proximity warning system, ADS-B receiver, data acquisition unit, heat sync, turn coordinator, directional gyro, and Mode S transponder were all opened for examination. None of their circuit boards exhibited any evidence of arcing, sooting, melting, or electrical damage. Additionally, the cockpit switches and circuit breakers were examined and no anomalies were noted.

Examination of the engine revealed that the three-blade propeller remained attached to the crankshaft. Two propeller blades exhibited chordwise scratches and tip curling, and one of those blades was also twisted. The third propeller blade was bent aft. The Nos. 1, 2, 3, 5, and 6 intake tubes were separated from the top of their respective cylinder. The top spark plugs were removed and their electrodes were intact, with the exception of the No. 4 spark plug, which exhibited impact damage. The electrodes exhibited corrosion consistent with submersion in the water at the bottom of the ravine. The engine-driven fuel pump was removed and its drive coupling was intact. Due to impact damage, the crankshaft could only be rotated about 90°; however, camshaft and crankshaft continuity was established to the rear accessory section of the engine.

Flight recorders

Data were successfully downloaded and plotted from the MFD and autopilot. The data ended consistent with the pilot's report that he shut off the electrical system before CAPS deployment. Review of the data did not reveal any mechanical or electrical anomalies that would have resulted in smoke in the cabin.

Administrative Information

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| Investigator In Charge (IIC): | Gretz, Robert |
| Additional Participating Persons: | Steve Harness; FAA/FSDO; Richmond, VA Eric Settergren; Cirrus Aircraft; Duluth, MN Nicole Channon; Continental Motors; Mobile, AL |
| Original Publish Date: | June 3, 2020 |
| Last Revision Date: | |
| Investigation Class: | Class |
| Note: | The NTSB traveled to the scene of this accident. |
| Investigation Docket: | https://data.nts.gov/Docket?ProjectID=100088 |

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](#).