



# National Transportation Safety Board Aviation Accident Final Report

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|--------------------------------|--------------------------------------|-------------------------|-------------|
| <b>Location:</b>               | Stuart, FL                           | <b>Accident Number:</b> | ERA14LA156  |
| <b>Date &amp; Time:</b>        | 03/14/2014, 1730 EDT                 | <b>Registration:</b>    | N419AR      |
| <b>Aircraft:</b>               | CESSNA 402B                          | <b>Aircraft Damage:</b> | Substantial |
| <b>Defining Event:</b>         | Fuel exhaustion                      | <b>Injuries:</b>        | 1 Minor     |
| <b>Flight Conducted Under:</b> | Part 91: General Aviation - Personal |                         |             |

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## Analysis

According to the pilot, he checked the fuel gauges before departure and believed he had enough fuel for the flight. As he approached his destination airport, he was instructed by an air traffic controller to enter a 2-mile left base. About 3 miles from the airport, the controller advised him to intercept a 6-mile final. About 1 1/2 miles from the runway, the left engine “quit.” The pilot repositioned the fuel valve to the left inboard fuel tank and was able to restart the engine, but, shortly after, the right engine “quit.” He then attempted to reposition the right fuel valve to the right inboard fuel tank to restart the right engine, but the left engine “quit” again, and the pilot subsequently made a forced landing in a field.

An examination of the engine and airplane systems revealed no anomalies that would have precluded normal operation. The left wing fuel tanks were found empty. The right wing was found separated from the fuselage. No evidence of fuel was noted in the right wing fuel tanks, and no evidence of fuel leakage was found at the accident site. The pilot reported that he saw fuel leaking out of the right wing fuel vent after the accident; it is possible that a small quantity of the airplane’s unusable fuel for the right tank could have leaked out immediately after the accident.

Although the pilot believed that the airplane had enough fuel onboard for the flight, his assessment was based on his calculations of the airplane’s fuel burn during several short flights he made after having the airplane topped off with fuel the night before the accident; he did not visually check the fuel level in the tanks before departing on the accident flight. The lack of fuel in the fuel tanks, the lack of evidence of fuel leakage, the loss of engine power in both engines, and the lack of mechanical anomalies are consistent with fuel exhaustion.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot’s improper preflight planning and fuel management, which resulted in a total loss of

power in both engines due to fuel exhaustion.

## Findings

|                         |   |
|-------------------------|---|
| <b>Aircraft</b>         | Fuel - Fluid level (Cause)  |
| <b>Personnel issues</b> | Fuel planning - Pilot (Cause)<br>Decision making/judgment - Pilot (Cause) |

## Factual Information

On March 14, 2014, about 1730 eastern daylight time, a Cessna 402B, N419AR, was substantially damaged when it collided with terrain while making a forced landing following loss of power in both engines while on short final approach to Witham Field Airport, Stuart, Florida. The commercial pilot sustained minor injuries. The airplane was registered to and operated by the commercial pilot under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the personal flight. The flight departed from St. Lucie County International Airport (FPR), Fort Pierce Florida at 1705.

According to the pilot, prior to departing he checked the fuel gauges and determined that he had approximately 28 gallons of fuel onboard, which he calculated as 1 hour of flight time. He did not indicate that he visually checked the fuel level in the tanks before departure. As he approached his destination airport he was instructed by air traffic control (ATC) to enter a 2 mile left base. Approximately 3 miles from the airport, ATC advised him to intercept a 6 mile final. The pilot stated that, at the time, he wasn't aware he had a fuel shortage situation. After turning final, the pilot configured the airplane for landing, and approximately one and a half miles from the runway, the left engine "quit." The pilot elected not to feather the left propeller because it would take six seconds to complete. Instead, he turned the left fuel valve to the left inboard fuel tank and the left engine restarted successfully; however, the right engine then "quit." The pilot then attempted to turn the right fuel valve to the right inboard tank, but the left engine quit again. The pilot made a forced landing in a field and impacted a tree before colliding with the ground, which resulted in substantial damage to both wings and the fuselage. The pilot stated that, upon exiting the airplane, he saw that a section of the right wing was inverted and "fuel was coming out of the right vent."

The Federal Aviation Administration (FAA) inspector who responded to the scene about 3.5 hours after the accident reported that he did not detect any fuel odor at the scene and that examination of the airplane revealed no evidence of fuel leakage. The FAA inspector stated that a law enforcement officer on scene informed him that the fire department personnel who responded to the scene did not spray any foam on the airplane because there was no fuel leaking from it.

Examination of the engines by the FAA revealed that due to external damage, an engine run could not be performed on either engine. An examination of the engines revealed that both engines were rotated by hand and valve train continuity and cylinder compression was obtained. Further examination revealed that spark was obtained on all ignition leads. Examination of the aircraft systems did not revealed any anomalies that would have precluded normal operation. Examination of the left wing tanks revealed that they were void of fuel. The right wing was separated from the fuselage and, although they were breached, no evidence of fuel was noted in any of the right wing tank.

In the pilot's written statement submitted to the NTSB, he indicated that the airplane was topped off with fuel the night before the accident. His statement described that, on the day of the accident, he flew several short flights before the accident flight. He provided his fuel endurance calculation for the airplane with full fuel then subtracted the "flight time" for each of the previous flights from that total endurance time to determine that, before departing on the accident flight, the airplane should have had "2 hours 23 minutes fuel left, without takeoff and

landing." The pilot explained the approaches for each of these flights and indicated that he taxied to the ramp to pick up and drop off friends at each destination.

## History of Flight

|                            |  |
|----------------------------|--|
| Prior to flight            | Preflight or dispatch event  |
| Approach-VFR pattern final | Fuel exhaustion (Defining event)<br>Loss of engine power (total)     |
| Emergency descent          | Off-field or emergency landing<br>Collision with terr/obj (non-CFIT) |

## Pilot Information

|                           |   |                                   |            |
|---------------------------|---|-----------------------------------|------------|
| Certificate:              | Commercial  | Age:                              | 71         |
| Airplane Rating(s):       | Multi-engine Land   | Seat Occupied:                    | Left       |
| Other Aircraft Rating(s): | None  | Restraint Used:                   |            |
| 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:            | 02/19/2013 |
| Occupational Pilot:       | No  | Last Flight Review or Equivalent: |            |
| Flight Time:              | 16000 hours (Total, all aircraft), 8000 hours (Total, this make and model), 45 hours (Last 90 days, all aircraft), 35 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft) |                                   |            |

## Aircraft and Owner/Operator Information

|                               |                                |                                |                 |
|-------------------------------|--------------------------------|--------------------------------|-----------------|
| Aircraft Make:                | CESSNA                         | Registration:                  | N419AR          |
| Model/Series:                 | 402B                           | Aircraft Category:             | Airplane        |
| Year of Manufacture:          |                                | Amateur Built:                 | No              |
| Airworthiness Certificate:    | Normal                         | Serial Number:                 | 402B0805        |
| Landing Gear Type:            | Retractable - Tricycle         | Seats:                         | 8               |
| Date/Type of Last Inspection: | 02/01/2014, Annual             | Certified Max Gross Wt.:       | 6300 lbs        |
| Time Since Last Inspection:   |                                | Engines:                       | 2 Reciprocating |
| Airframe Total Time:          | 5860 Hours at time of accident | Engine Manufacturer:           | CONT MOTOR      |
| ELT:                          | C91 installed, not activated   | Engine Model/Series:           | TSIO-520 SER    |
| Registered Owner:             | MARDON INC                     | Rated Power:                   | 300 hp          |
| Operator:                     | Marlin Moudy                   | Operating Certificate(s) Held: | None            |

## Meteorological Information and Flight Plan

|                                  |                                  |   |                  |
|----------------------------------|----------------------------------|---|------------------|
| Conditions at Accident Site:     | Visual Conditions                | Condition of Light:                     | Day              |
| Observation Facility, Elevation: | SUA, 16 ft msl                   | Distance from Accident Site:            | 1 Nautical Miles |
| Observation Time:                | 1747 EDT                         | Direction from Accident Site:           | 300°             |
| Lowest Cloud Condition:          | Scattered / 4000 ft agl          | Visibility                              | 7 Miles          |
| Lowest Ceiling:                  | None                             | Visibility (RVR):                       |                  |
| Wind Speed/Gusts:                | 12 knots /                       | Turbulence Type<br>Forecast/Actual:     | / None           |
| Wind Direction:                  | 120°                             | Turbulence Severity<br>Forecast/Actual: | /                |
| Altimeter Setting:               | 30.22 inches Hg                  | Temperature/Dew Point:                  | 22° C / 6° C     |
| Precipitation and Obscuration:   | No Obscuration; No Precipitation |   |                  |
| Departure Point:                 | Fort Pierce, FL (FPR)            | Type of Flight Plan Filed:              | None             |
| Destination:                     | Stuart, FL (SUA)                 | Type of Clearance:                      | None             |
| Departure Time:                  | 1705 EDT                         | Type of Airspace:                       |                  |

## Airport Information

|                      |                            |                           |                |
|----------------------|----------------------------|---------------------------|----------------|
| Airport:             | Witham Field Airport (SUA) | Runway Surface Type:      | N/A            |
| Airport Elevation:   | 11 ft                      | Runway Surface Condition: | Vegetation     |
| Runway Used:         | N/A                        | IFR Approach:             | None           |
| Runway Length/Width: |                            | VFR Approach/Landing:     | Forced Landing |

## Wreckage and Impact Information

|                     |         |                      |                            |
|---------------------|---------|----------------------|----------------------------|
| Crew Injuries:      | 1 Minor | Aircraft Damage:     | Substantial                |
| Passenger Injuries: | N/A     | Aircraft Fire:       | None                       |
| Ground Injuries:    | N/A     | Aircraft Explosion:  | None                       |
| Total Injuries:     | 1 Minor | Latitude, Longitude: | 27.000000, 80.000000 (est) |

## Administrative Information

|                                   |   |              |            |
|-----------------------------------|---|--------------|------------|
| Investigator In Charge (IIC):     | Eric Alleyne  | Report Date: | 02/04/2015 |
| Additional Participating Persons: | Greg Morales; FAA; South Florida FSDO, FL   |              |            |
| Publish Date:                     | 02/04/2015  |              |            |
| Investigation Docket:             | <a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=88923">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=88923</a> |              |            |

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).