Aviation Investigation Final Report

Location:	Bandera, Texas	**Accident Number:**	CEN20LA058
Date & Time:	January 11, 2020, 17:20 Local	**Registration:**	N350XL
Aircraft:	Piper PA46	**Aircraft Damage:**	Substantial
Defining Event:	Fire/smoke (non-impact)	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During flight, the pilot observed a warning message on the primary flight display indicating “AVIFAN FAIL.” As he was trouble-shooting the electrical system, smoke began to enter the cabin from the front of the cockpit. The pilot suspected an electrical fire. He disconnected the autopilot, lowered the landing gear, and turned off the battery master switch. After he declared a “Mayday,” the pilot searched for the nearest airport, which was about 13-miles from his position. Smoke was still coming into the cabin, and the pilot's "eyes were burning." The pilot decided that he had to land the airplane without delay because of the potential fire. He decided to land the airplane in what appeared to be a flat field directly ahead.

As the airplane approached the landing point, the pilot extended the first notch of flaps, the airplane crossed over a fence, and landed. The pilot immediately realized that the airplane was fast and on a collision course with another fence and trees, so he rotated the airplane and cleared the obstacles. He immediately turned the airplane to the right and landed the airplane on an adjacent roadway. Upon landing, the airplane hit a roadway signpost with the right wing and the airplane spun 90 degrees to the right, and came to rest with the nose against a roadway guardrail. The outboard section of the right wing sustained substantial damage.

Detailed examination of the airplane’s electrical system revealed thermal damage and discoloration on a circuit board of one of the avionics cooling fans. The thermal damage to the fan circuit board would have likely produced smoke that would be irritating to the eyes, which was consistent with what the pilot reported. No other damage or electrical anomalies were found during the examination.

Probable Cause and Findings

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

The in-flight electrical fire, which resulted in smoke in the cabin and an emergency landing. Contributing to the accident was the unsuitable terrain for the emergency landing.

Findings

Aircraft	(general) - Malfunction
Environmental issues	(general) - Contributed to outcome

Factual Information

History of Flight

Enroute-descent	Fire/smoke (non-impact) (Defining event)

On January 11, 2020, about 1720 central standard time, a Piper PA-46-350P, N350XL, was substantially damaged when it was involved in an accident near Bandera, Texas. The pilot and one passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations (CFR)* Part 91 personal flight.

The pilot reported that he was on a local flight and filed an Instrument Flight Rules (IFR) flight plan. He took off from the San Antonio International Airport (SAT) and his intention was to return to SAT after the flight. The takeoff was normal and the airplane performed as expected. After being cleared to climb to 24,000 ft, he heard what seemed to be some sort of sound as if metal was rubbing against metal," and the sound subsided. The pilot continued the flight, and all engine performance indications were as expected. The pilot asked Air Traffic Control (ATC) to start his return to SAT and descend. During the descent, a CAS message, "AVI FAN Fail," message appeared on the primary flight display (PFD). The message was white in color. He consulted his Garmin 1000 (G1000) reference guide to decode the CAS message and to see the recommended procedure for troubleshooting the code. The pilot stated that since the CAS message was white in color, he thought that it was "advisory" in nature, because the manual stated that a "white" CAS message was Advisory, "yellow," was Caution, and "red" was Warning.

As the pilot was consulting the G1000 manual, smoke started to come into the cabin from the front of the cockpit. The pilot immediately suspected an electrical fire. He disconnected the autopilot, lowered the landing gear, turned the battery master switch off, dumped cabin pressure, and turned the EMER switch on. As a precaution, he also pulled the hydraulic pump circuit breaker just in case it was the cause of the electrical fire. The pilot had his passenger read out the emergency checklist for an electrical fire. After completing the checklist, the pilot radioed a "Mayday." Meanwhile, the pilot searched for the nearest airport to land, which was about 13 miles from his position. The airplane was in a 600-ft per minute descent. Smoke was still coming into the cabin, and the pilot's "eyes were burning," The pilot decided that he had to land the airplane without delay because of the potential fire. A red "X" indication appeared on the manifold pressure gauge as the airplane descended. The airplane seemed descend at a higher rate of descent than the pilot expected.

The airplane was about 3,000-4,000 ft MSL and the terrain in the area was between 1,000 to 2,000 ft AGL. The pilot thought that he did not have much time to land given the higher-than-expected rate of descent. He decided to land the airplane in what appeared to be a flat field directly ahead. The pilot chose his landing point in the field, and as the airplane got closer, the pilot saw that the field appeared to be a large field made up of three rectangular fields separated by fences, and the last fence was followed by thick trees. The pilot decided to land in the third field and planned on braking heavy to stop. As the airplane approached the landing point, the pilot added one notch of flaps in, the airplane crossed over a fence, and landed. The pilot immediately realized that the airplane was fast, and a collision with another

fence and trees would be unavoidable. The pilot thought that he had enough airspeed and momentum to try to clear the fence and trees, maybe even land on top of them rather than into them, so he rotated the airplane and cleared the obstacles. He immediately turned the airplane to the right and landed the airplane on an adjacent roadway. Upon landing, the airplane contacted a roadway signpost with the right wing, the airplane spun 90 degrees to the right, and came to rest with the nose against a roadway guardrail. The pilot and passenger exited the airplane and called for assistance. The outboard section of the right wing sustained substantial damage.

After recovery, the airplane's avionics were powered up and a methodical examination was performed on each electrical system, including the avionics cooling fans. After confirming that the pilot's side avionics cooling fan would not operate when connected to an electrical power source, the fan was disassembled. After removing the fan blades from the motor assembly, an area of thermal damage and discoloration was observed on the circuit board. Photographs of the fan assembly were sent to a National Transportation Safety Board fire specialist for consultation. The specialist stated that the thermal damage to the fan circuit board would have likely produced smoke that would be irritating to the eyes, which was consistent with the pilot reported. No other damage or electrical anomalies were found during the examination.

Pilot Information

Certificate:	Private	**Age:**	35,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	June 15, 2019
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 7, 2020
Flight Time:	420 hours (Total, all aircraft), 360 hours (Total, this make and model), 188 hours (Pilot In Command, all aircraft), 40 hours (Last 90 days, all aircraft), 14 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N350XL
Model/Series:	PA46 350P	**Aircraft Category:**	Airplane
Year of Manufacture:	2015	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	4636673
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	November 27, 2019 Annual	**Certified Max Gross Wt.:**	4358 lbs
Time Since Last Inspection:	4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	511 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C126 installed, not activated	**Engine Model/Series:**	TIO-540-AE2A
Registered Owner:	Mission Flight Charter Services Llc	**Rated Power:**	350 Horsepower
Operator:	Mission Flight Charter Services Llc	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	SAT,809 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	16:51 Local	**Direction from Accident Site:**	300°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	20°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	15°C / 1°C
Precipitation and Obscuration:			
Departure Point:	San Antonio, TX (SAT)	**Type of Flight Plan Filed:**	IFR
Destination:	San Antonio, TX (SAT)	**Type of Clearance:**	IFR
Departure Time:	16:20 Local	**Type of Airspace:**	Class E

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	In-flight
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	29.44,-98.580001(est)

Administrative Information

Investigator In Charge (IIC):	Lemishko, Alexander
Additional Participating Persons:	Robert Arispe; FAA FSDO; San Antonio, TX Jonathon Hirsh; Piper Aircraft; Vero Beach, FL
Original Publish Date:	March 9, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=100801