Aviation Investigation Final Report

Location:	Hanna City, Illinois	**Accident Number:**	CEN22FA383
Date & Time:	August 13, 2022, 12:31 Local	**Registration:**	N30EV
Aircraft:	MOONEY AIRCRAFT CORP. M20K	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot had flown about 4.8 hours and was about 10 miles from the destination airport when he reported to air traffic control that the engine lost all power and that he was not going to be able to reach the destination airport. A review of automatic dependent surveillance-broadcast (ADS-B) data showed the airplane aligned with a road with the last data point about 675 ft above mean sea level (msl).

Surveillance video footage captured the airplane near the last ADS-B data point. In the video, the landing gear was extended, and the propeller appeared to be windmilling. As the airplane descended, it struck powerlines. A second video taken from inside a vehicle showed the airplane immediately after the powerline contact. The airplane continued the descent and touched down on the roadway. After touchdown, the left wing impacted a bridge railing, a road sign, and a power pole, which separated the left wing. The remainder of the airplane impacted a building, which resulted in substantial damage to the fuselage.

A postaccident examination revealed that the left-wing fuel tank was breached during the impact and absent of fuel. The right-wing fuel tank remained intact, and only a small amount of fuel was present inside the tank. The fuel selector was positioned on the “RIGHT TANK.” The fuel strainer contained about 3 oz of fuel and the fuel line into the fuel flow divider was absent of fuel. No mechanical malfunctions or failures were discovered with the airframe or engine that would have precluded normal operation. The airplane was equipped with a fuel-injected engine and, as such, was not susceptible to carburetor icing.

Although the pilot added 54 gallons of fuel the day before the accident, the exact amount of fuel onboard at the time of departure could not be determined. A review of airplane performance charts and wind aloft observations revealed that if the flight had departed with

just the 54 gallons, the endurance would have been between 3.7 and 4.7 hours. Had the airplane departed with full fuel tanks (75.6 usable gallons), the endurance would have been between 5.4 and 6.8 hours. These calculations do not include additional fuel required to climb to altitude.

Based upon the lack of fuel in the fuel lines, flow divider, and right wing fuel tank, it is likely the engine lost power due to fuel exhaustion.

Toxicology testing revealed that the pilot had used cannabis as low concentrations of its inactive metabolite THC-COOH were detected in his heart blood and urine. The active, short-lived metabolite of THC, 11-OH-THC was detected in his urine, but not in his blood. While the pilot's pattern of cannabis use is unknown, given the lack of psychoactive THC in his blood and low concentration of 11-OH-THC and THC-COOH in his urine, it is unlikely that the pilot was under the influence of THC. Thus, while the pilot was found to have cannabis in his body,the effects of the pilot's use of cannabis did not contribute to this accident.

Probable Cause and Findings

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

A total loss of engine power due to fuel exhaustion.

Findings

Aircraft	Fuel - Fluid level
Personnel issues	Decision making/judgment - Pilot

Factual Information

History of Flight

Enroute-descent	Loss of engine power (total) (Defining event)
Landing	Collision during takeoff/land

On August 13, 2022, about 1231 central daylight time, a Mooney M20K airplane, N30EV, sustained substantial damage when it was involved in an accident near Hannah City, Illinois. The pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The flight departed Santa Fe Municipal Airport (SAF), Santa Fe, New Mexico, about 0639 mountain daylight time, destined for Peoria International Airport (PIA), Peoria, Illinois. A fuel receipt from Jet Center at SAF indicated that 54.2 gallons of fuel was purchased for the accident airplane on August 10, 2022. A review of ADS-B data revealed that, following the fuel purchase, the airplane departed SAF and flew one time around the traffic pattern on a flight that lasted about 4 minutes. No additional fuel receipts were located that indicate the airplane was refueled following the flight on August 10th and no subsequent flights were made until the accident flight.

A review of ADS-B data revealed that after departure, the airplane climbed to an altitude of 15,000 ft and remained at that altitude for the almost 5-hour flight. The data showed the flight as continuous with no stops. When the airplane was about 28 miles west of PIA, the pilot established communications with the PIA air traffic control tower and reported inbound with the current weather information. The controller advised the pilot to enter a right downwind for runway 22. When the airplane was about 10 miles west of PIA, the pilot informed the controller that the engine lost all power. When queried if they would be able to reach PIA, the pilot stated that they would be unable. The last recorded data point showed the airplane traveling west about 675 ft msl and lined up with a road.

Surveillance video footage captured the airplane about one block east of the last data point. In the video, the landing gear was extended, and the propeller appeared to be windmilling. As the airplane descended it struck powerlines. A second video taken from inside a vehicle showed the airplane immediately after the powerline contact. The airplane continued the descent and touched down on the roadway. After touch down, the left wing impacted a bridge railing and then a road sign. The airplane continued eastbound, and the left wing then impacted a power pole, which separated the left wing about 6’9” outboard of the wing root. The rest of the airplane continued until it impacted a building, which resulted in substantial damage to the fuselage.

Pilot Information

Certificate:	Commercial	**Age:**	74,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	None	**Last FAA Medical Exam:**	April 28, 2016
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 2900 hours (Total, all aircraft)		

The pilot was issued a Third Class Medical Certificate with the following limitation: “Must wear lenses for distant, have glasses for near vision,” which expired for all classes in 2018. He subsequently, applied for BasicMed and completed the BasicMed course on June 3, 2020, and the Comprehensive Medical Examination Checklist was dated January 6, 2020. The BasicMed course was valid for two years and no subsequent course completion was submitted to the FAA.

Aircraft and Owner/Operator Information

Aircraft Make:	MOONEY AIRCRAFT CORP.	**Registration:**	N30EV
Model/Series:	M20K	**Aircraft Category:**	Airplane
Year of Manufacture:	1982	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	25-0708
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Continental Motors
ELT:		**Engine Model/Series:**	TSIO-360
Registered Owner:	On file	**Rated Power:**	
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KPIA,655 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	11:54 Local	**Direction from Accident Site:**	106°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.07 inches Hg	**Temperature/Dew Point:**	26°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Santa Fe, NM (SAF)	**Type of Flight Plan Filed:**	None
Destination:	Peoria, IL (PIA)	**Type of Clearance:**	None
Departure Time:	06:39 Local	**Type of Airspace:**	Class E

A High Resolution Rapid Refresh (HRRR) model sounding was created for the accident time and location, with the modeled surface elevation at 2,890 ft msl. At an elevation of 15,278 ft msl, the HRRR sounding indicated the wind was from 288° at 11.1 knots.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	40.692292,-89.795948

A postaccident examination revealed that the left-wing fuel tank was breached during the impact and absent of fuel. The right-wing fuel tank remained intact, and when opened only a small amount of fuel was present inside the tank. The fuel selector was positioned on the "RIGHT TANK." The fuel strainer contained about 3 oz of fuel and the fuel line into the fuel flow divider was absent of fuel. The fuel flow divider was disassembled and no blockages were observed within the divider or fuel lines that would have prevented fuel from reaching the cylinders.

A detailed examination of the airframe and engine revealed no mechanical malfunctions or failures that would have precluded normal operation.

The airplane was equipped with a Shadin Avionics MiniFlo digital fuel management system, which was designed to provide fuel management information under real time flight conditions to the flight crew. The unit was connected to the engine fuel flow transducers and did not interface with the airplane's fuel quantity indicating system. The unit required the pilot to enter the initial fuel on board the airplane and all calculations and data provided by the unit were based on fuel flow and any provided navigational information. When power was applied to the unit, it displayed the gallons used as 64.9 gallons and the gallons remaining as 10.1 gallons. The unit did not retain data indicating the last time the system was reset to full fuel.

Medical and Pathological Information

Toxicology testing performed by the FAA Forensic Sciences Laboratory detected the inactive metabolite of delta-9-tetrahydrocannabinol (THC), carboxy-delta-9-tetrahydrocannabinol (THC-COOH), in the pilot's heart blood at 2.2 nanograms per milliliter (ng/mL) and in urine at 18.9 ng/mL. THC's short-lived psychoactive metabolite, 11-hydroxy-delta-9-THC (11-OH-THC), was

detected in his urine at 3.4 ng/mL, but not in his blood. The non-impairing high blood pressure medication chlorthalidone was detected in his heart blood and urine. Quinine was also detected in his heart blood and urine; quinine is a non-impairing medication used in the treatment of malaria and leg cramps and as an additive in tonic water.

Additional Information

According to ADS-B data, when the airplane was abeam Garden City, Kansas, the ground speed was about 177 knots and the airplane was on a ground track of about 060°. When the wind data was applied to the track information, the tailwind component was about 7 knots, which would result in an airspeed of about 170 knots.

According to the pilot's operating handbook (POH), an altitude of 15,000 ft and at an airspeed of about 170 knots equated to about a 70% engine power setting; engine fuel consumption at 70% power can range from 10.2 gph to 12.5 gph. Fueling records indicated that the pilot added 54 gallons of 100LL the last time fuel was added. The total fuel capacity of the accident airplane was 78.6 gallons, of which 75.6 gallons were usable. The exact fuel quantity onboard when the airplane departed SAF and the cruise power setting could not be determined.

According to the POH, the airplane would have been expected to consume between 5.41 and 7.58 gallons of fuel during climb. Using 54 gallons as a minimum fuel on board at the time of departure and accounting for climb fuel consumption, the endurance would be between 3.7 hrs and 4.7 hrs, depending on the engine power setting selected by the pilot for the cruise portion of the flight. If the fuel tanks were full before departure, the endurance would have been between 5.4 hrs and 6.8 hrs.

A recovered Garmin 396 GPS contained an aircraft profile page that listed the accident airplane and a corresponding fuel flow of 12.5 gallons per hour.

Administrative Information

Investigator In Charge (IIC):	Williams, David
Additional Participating Persons:	Nick Loftus; FAA; Springfield, IL
Original Publish Date:	October 5, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=105730