



# Aviation Investigation Final Report

<b>Location:</b>	New York, New York	<b>Accident Number:</b>	ERA19LA150
<b>Date &amp; Time:</b>	April 13, 2019, 22:15 Local	<b>Registration:</b>	N5296H
<b>Aircraft:</b>	Cessna 172	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Fuel exhaustion	<b>Injuries:</b>	3 Minor
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot filed an instrument flight rules flight plan with an estimated en route time of 3.5 hours; however, air traffic control revised his route during the flight, which added an additional 40 to 50 minutes to the total flight time. Upon arrival at the destination airport in night instrument meteorological conditions, the pilot attempted three precision instrument approaches before diverting to a larger airport, where he performed two additional approaches, both of which he terminated and conducted missed approaches due to the weather conditions. During the third approach to the larger airport, the airplane's fuel supply was exhausted, and the engine lost all power. The pilot pitched the airplane for its best glide speed; about 100 ft above the ground, he saw streetlights and attempted to land on the road below. The airplane impacted a building and power lines and came to rest suspended in the power lines a few feet above the ground.

Postaccident examination revealed that the fuel tanks were void of fuel. Examination of the airframe, engine, and the vacuum system found no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation. The pilot had accrued about 80 flight hours of simulated instrument flight experience, and 1 hour of flight experience in actual instrument meteorological conditions with a flight instructor. The accident flight was his first acting as a pilot-in-command while in instrument meteorological conditions.

Weather forecasts for the destination airport and surrounding airports issued before the flight departed projected low instrument flight rules (IFR) conditions at the estimated time of arrival. However, the pilot did not obtain a formal weather briefing before the accident flight. The pilot reported that he was aware of the bad weather before takeoff but decided to complete the flight because one of the passengers had to make an international trip the following day. It is likely that this external pressure contributed to the pilot's decision to attempt the accident flight regardless of the weather conditions.

# Probable Cause and Findings

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

The pilot's decision to initiate a flight into low instrument flight rules conditions, which resulted in six missed approaches at two airports and a total loss of engine power due to fuel exhaustion. Contributing to the accident was the external pressure the pilot felt to complete the accident flight despite the poor weather conditions.

## Findings

Personnel issues	Decision making/judgment - Pilot
Environmental issues	Low ceiling - Decision related to condition
Environmental issues	Low visibility - Decision related to condition
Environmental issues	Fog - Decision related to condition
Aircraft	Fuel - Fluid management
Aircraft	Fuel - Fluid level
Personnel issues	Motivation/respond to pressure - Pilot

## Factual Information

### History of Flight

<b>Prior to flight</b>	Preflight or dispatch event
<b>Approach-IFR final approach</b>	Fuel exhaustion (Defining event)
<b>Approach-IFR final approach</b>	Collision with terr/obj (non-CFIT)

On April 14, 2019, about 2215 eastern daylight time, a Cessna 172N, N5296H, was substantially damaged when it impacted a building and powerlines during a diversion to John F. Kennedy International Airport (JFK), New York, New York. The private pilot and two passengers sustained minor injuries. The airplane was registered to N5296H LLC. and operated by 2BAPilot NYC Flight School and Aircraft Rental under the provisions of Title 14 *Code of Federal Regulations* Part 91 as a personal flight. Night instrument meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the flight that originated from Niagara Falls International Airport (IAG), Niagara Falls, New York about 1710 and was destined for Republic Airport (FRG), Farmingdale, New York.

The pilot reported that on the morning of the accident, he and his passengers arrived at FRG airport about 0630 and departed for IAG, arriving about 1100. They spent the day in the area and departed to return with a direct route to FRG; while enroute, the pilot reported that his planned route was changed by air traffic control which increased the enroute time by about 40-50 minutes longer than he had expected. Once arriving into the FRG area, he attempted a precision instrument landing system (ILS) approach to runway 14 which resulted in a missed approach. He attempted the ILS approach again, and on this attempt, "saw some lights," but was unable to see the runway and performed another missed approach.

The pilot attempted the FRG ILS runway 14 approach for a third time, and during the approach he noticed that there was "something wrong with the heading indicator." He realized his course was "zigzagging," so he began to have a passenger tell him what the track heading was displaying on an electronic flight bag application; he subsequently decided a "bigger airport will be better" so he diverted to JFK, via radar vectors from air traffic control.

The pilot reported that he attempted three ILS approaches to runway 22L at JFK. The first two resulted in missed approaches, and on the third attempt, the pilot reported that the "fuel went out" and the "engine totally stopped." During the power out descent, he flew the "best glide speed" and about 100 ft above ground, he saw streetlights and made a left turn towards a road. While in the turn the airplane impacted the roof of a building and powerlines. The airplane came to rest entangled in the power lines suspended just a few feet above the ground; the pilot and passengers were able to exit from the main cabin doors onto the street below.

The pilot reported that he utilized a timing method for his fuel consumption, because he noticed that after about one hour of flying time enroute, both fuel gauges were stuck indicating full. He believed he

had about 5 hours and 20 minutes of fuel onboard at takeoff, which was a full 42 gallons. The pilot reported that he expected the accident flight to take about 3 hours and 30 minutes; however, the total flight time was about 5 hours and 5 minutes.

Review of an FAA summary of air traffic control and pilot communications revealed that controllers provided the pilot with several observation weather reports and pilot reports (PIREPs) during his approaches at FRG and JFK. They also requested and received updates from the pilot regarding his low fuel state during the approaches. The record revealed that the pilot did not declare an emergency throughout the flight; however, during the diversion to JFK, air traffic control internally designated the flight as an emergency and had alerted emergency equipment prior to the airplane's loss of engine power.

According to a Federal Aviation Administration (FAA) inspector who examined the airplane at the accident site, the fuselage, wings, and empennage sustained substantial damage. There was no odor of fuel at the accident site, nor was fuel observed in the wing tanks.

A subsequent examination of the engine found no pre-impact mechanical malfunctions or failures that would have precluded normal operation. Additional examination of the vacuum system found that the pump remained intact, the drive coupling operated normally, there were no blockages observed in the vacuum air hoses, and the pump's wear indicator was within normal operational limits.

According to FAA airmen records, the pilot held a commercial pilot certificate with ratings for airplane single and multi-engine land, and instrument airplane. He held a first-class medical certificate issued in January 2018. The pilot reported that he had logged about 80 hours of simulated instrument flight time, of which one hour was in actual instrument conditions and that flight was with a flight instructor. He reported that the accident flight was his first flight in actual instrument conditions as the pilot in command.

According to FAA airworthiness records, the 4-seat high wing airplane was powered by a Lycoming O-320-H2AD 160-horsepower engine. The most recent annual inspection was completed in January 2019.

According to an NTSB weather study, about the time of departure from IAG and throughout the cross-country flight, IFR conditions were observed at the destination airport and the filed alternate airport (LaGuardia Airport (LGA), New York, New York). The weather conditions reported at FRG and JFK during the pilot's approaches included low visibility and cloud ceilings. At 2153 the weather conditions reported at FRG were, visibility 1/4-mile, fog, vertical visibility 200 ft above ground, wind 200° at 8 knots, temperature 14°C, dew point 14°C, and barometric pressure of 29.65 inches of mercury. One-hour prior at FRG, the visibility and cloud ceiling were the reported as the same (visibility 1/4-mile, fog, vertical visibility 200 ft).

At 2212 the weather conditions at JFK were, visibility 1/8-mile, fog, vertical visibility 200 ft above ground, wind 180° at 15 knots, temperature 13°C, dew point 13°C, and barometric pressure of 29.64 inches of mercury. About the time of the accident, FRG, JFK, LGA, and several other New York area airports were observing low IFR conditions. Figure 1 depicts the surrounding weather observation reports at the time of the accident.

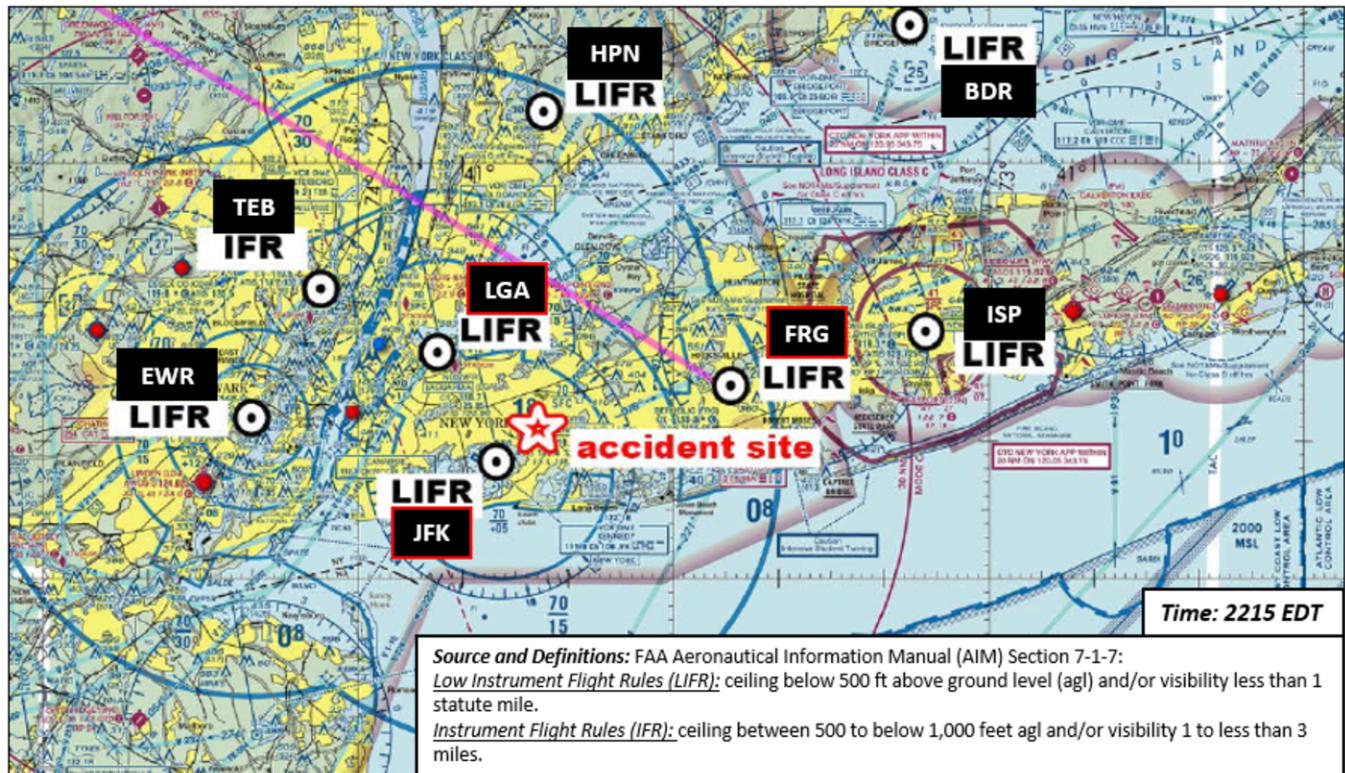


Figure 1: Weather Observations at the Time of the Accident in the New York Area

Forecast weather products issued prior to the departure from IAG, including AIRMETs and Terminal Aerodrome Forecast (TAFs), called for low IFR conditions at the accident airport and surrounding airports about the time of the pilot's estimated time of arrival.

According to Leidos Flight Service, there was no record that the pilot requested a weather briefing for the accident flight. The pilot reported in a written statement that, "I found that FRG will be bad weather but one of my friend need to go Korea next day. I decide to try to come back, and alternate LGA, because I could land [at] big airport."

The FAA Pilot's Handbook of Aeronautical Knowledge provided a variety of tools regarding aeronautical decision making. One such item was the "PAVE" checklist. The FAA PHAK stated in part:

### ***The PAVE Checklist***

*Another way to mitigate risk is to perceive hazards. By incorporating the PAVE checklist into preflight planning, the pilot divides the risks of flight into four categories: **P**ilotin-command (PIC), **A**ircraft, **e**nVironment, and **E**xternal pressures (PAVE) which form part of a pilot's decision-making process.*

### ***E = External Pressures***

*External pressures are influences external to the flight that create a sense of pressure to complete a flight—often at the expense of safety. Factors that can be external pressures include the following:*



- ? Someone waiting at the airport for the flight's arrival A passenger the pilot does not want to disappoint
- ? The desire to demonstrate pilot qualifications
- ? The desire to impress someone (Probably the two most dangerous words in aviation are "Watch this!")
- ? The desire to satisfy a specific personal goal ("get-there-itis")
- ? The pilot's general goal-completion orientation

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	27, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 With waivers/limitations	<b>Last FAA Medical Exam:</b>	January 19, 2018
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	March 4, 2019
<b>Flight Time:</b>	279 hours (Total, all aircraft), 232 hours (Total, this make and model), 214 hours (Pilot In Command, all aircraft), 46 hours (Last 90 days, all aircraft), 14 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Cessna	<b>Registration:</b>	N5296H
<b>Model/Series:</b>	172 N	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1977	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	17269408
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	January 11, 2019 Annual	<b>Certified Max Gross Wt.:</b>	2300 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	2857.1 Hrs at time of accident	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	O-320-H2AD
<b>Registered Owner:</b>		<b>Rated Power:</b>	160 Horsepower
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Instrument (IMC)	<b>Condition of Light:</b>	Night
<b>Observation Facility, Elevation:</b>	KJFK, 12 ft msl	<b>Distance from Accident Site:</b>	2 Nautical Miles
<b>Observation Time:</b>	22:12 Local	<b>Direction from Accident Site:</b>	50°
<b>Lowest Cloud Condition:</b>	Unknown / 200 ft AGL	<b>Visibility</b>	
<b>Lowest Ceiling:</b>	Indefinite (V V) / 200 ft AGL	<b>Visibility (RVR):</b>	1400 ft
<b>Wind Speed/Gusts:</b>	15 knots /	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>	180°	<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	29.63 inches Hg	<b>Temperature/Dew Point:</b>	13°C / 13°C
<b>Precipitation and Obscuration:</b>	Moderate - None - Fog		
<b>Departure Point:</b>	Niagara Falls, NY (IAG )	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Farmingdale, NY (FRG )	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	17:10 Local	<b>Type of Airspace:</b>	Class B

## Airport Information

<b>Airport:</b>	John F Kennedy Intl JFK	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	12 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	22L	<b>IFR Approach:</b>	ILS
<b>Runway Length/Width:</b>	8400 ft / 200 ft	<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Minor	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	2 Minor	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	3 Minor	<b>Latitude, Longitude:</b>	40.676944,-73.714164(est)

## Preventing Similar Accidents

**Manage Risk: Good Decision-making and Risk Management Practices are Critical**

Although few pilots knowingly accept severe risks, accidents can also result when several risks of marginal severity are not identified or are ineffectively managed by the pilot and compound into a dangerous situation. Accidents also result when the pilot does not accurately perceive situations that involve high levels of risk. Ineffective risk management or poor aeronautical decision-making can be associated with almost any type of fatal general aviation accident.

By identifying personal attitudes that are hazardous to safe flying, applying behavior modification techniques, recognizing and coping with stress, and effectively using all resources, pilots can substantially improve the safety of each flight. Remember that effective risk management takes practice. It is a decision-making process by which pilots can systematically identify hazards, assess the degree of risk, and determine the best course of action. Pilots should plan ahead with flight diversion or cancellation alternatives and not be afraid to change their plans; it can sometimes be the difference between arriving safely late or not arriving at all.

See [http://www.nts.gov/safety/safety-alerts/documents/SA\\_023.pdf](http://www.nts.gov/safety/safety-alerts/documents/SA_023.pdf) for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).



## Administrative Information

<b>Investigator In Charge (IIC):</b>	Gerhardt, Adam		
<b>Additional Participating Persons:</b>	John Harris; FAA/ FSDO; Farmingdale, NY		
<b>Original Publish Date:</b>	December 3, 2020	<b>Investigation Class:</b>	3
<b>Note:</b>	The NTSB did not travel to the scene of this accident.		
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=99258">https://data.nts.gov/Docket?ProjectID=99258</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](#).