

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA22FA279

OPERATIONAL FACTORS

Group Chair's Factual Report

November 21, 2022

TABLE OF CONTENTS

A. ACCIDENT.....	3
B. OPERATIONAL FACTORS GROUP	3
C. SUMMARY	3
D. DETAILS OF THE INVESTIGATION	3
E. FACTUAL INFORMATION	4
1.0 HISTORY OF FLIGHT.....	4
2.0 PILOT INFORMATION	5
2.1 The Pilot’s Certification Record.....	6
2.2 The Pilots’ Certificates Held at the Time of the Accident.....	7
2.3 The Pilot’s Flight Times	7
3.0 MEDICAL AND PATHOLOGICAL	8
4.0 HELICOPTER INFORMATION	9
4.1 N98F Airworthiness Certificate	10
5.0 WEIGHT AND BALANCE	13
6.0 AIRPORT INFORMATION.....	13
6.1 FAA Sectional Chart	15
7.0 METEOROLOGICAL INFORMATION	16
8.0 COMPANY INFORMATION	16
8.1 MARPAT Aviation, LLC Flight Routes	17
9.0 RELEVANT PROCEDURES.....	21
F. FAA OVERSIGHT	21
9.1 MARPAT Aviation, LLC Donations	24
10.0 FAA PROGRAM LETTER.....	26
10.1 Living History of Flight Exemptions	28
G. ATTACHMENTS.....	29

A. ACCIDENT

Location: Amherstdale, West Virginia
Date: June 22, 2022
Time: 1645 eastern daylight time¹
Helicopter: Bell UH-1B

B. OPERATIONAL FACTORS GROUP

Group Chair David Lawrence, Group Chairman
National Transportation Safety Board
Washington, DC

Group Member Todd Gentry
Federal Aviation Administration
Washington, DC

C. SUMMARY

On June 22, 2022, about 1645 eastern daylight time, a Bell UH-1B helicopter, registration N98F, was destroyed when it was involved in an accident in Amherstdale, West Virginia. The private pilot, two pilot rated passengers and three additional passengers were fatally injured. The helicopter was operated by MARPAT Aviation, LLC as a Title 14 *Code of Federal Regulations (CFR)* Part 91 flight.

D. DETAILS OF THE INVESTIGATION

The Operations Group did not launch for this accident. FAA information on the operator and pilot were requested. On July 28, 2022, the Operations Group traveled to Charleston, West Virginia and conducted interviews of the MARPAT Aviation, LLC Aviation owner and the MARPAT Aviation, LLC mechanic.

Following the MARPAT Aviation, LLC interviews in Charleston, West Virginia, the group traveled to the accident site for observation. The group then traveled to Logan County Airport (6L4) and met with airport management, who provided additional fueling records for N98F.

On July 29, 2022 the Group conducted interviews of the FAA Principal Maintenance Inspector (PMI) and Front Line Manager (FLM) at the Charleston, West Virginia Flight Standards District Office (EA09).

¹ All times in the Factual Report are eastern daylight time (EDT) unless otherwise noted.

E. FACTUAL INFORMATION

1.0 History of Flight

The accident flight was associated with the “7th Annual Huey Reunion” during which MARPAT Aviation, LLC provided the public with an opportunity to ride in or fly a Huey helicopter. The 6-day event was held at the Logan County Airport in Logan, West Virginia and the reunion flights were flown by volunteer pilots.² The accident occurred at the end of the second day of the event.

According to witnesses, on the morning of June 19, 2022 and June 20, 2022 a safety briefing was conducted by a volunteer pilot prior to the reunion flights that included the following items:³

- *The safety pilot is the aircraft commander and in charge of all operations.*
- *Only the safety pilot will pick the aircraft up or set the aircraft down on any hard surface.*
- *All approaches outside the airport terminate at a 10 foot hover and there will be no touchdowns except at the Logan (6L4) airport*
- *Do not descend into an area that you are not completely aware of. If you have not been there before do not descend into the area without a thorough and complete recon.*

According to multiple witnesses, N98F was pre-flighted by a volunteer pilot and the MARPAT Aviation, LLC mechanic about 0800 on the morning of the accident. After the engine was started for the first flight of the day, it remained operating the entire day.⁴ Passengers were loaded and off-loaded during the day with the engine running continuously.⁵

The accident pilot was the pilot in command (PIC) for the accident flight and was in the left front left seat of the helicopter.⁶ There were five passengers onboard. The

² MARPAT Aviation, LLC referred to the volunteer pilots as “safety” pilots.

³ See Attachment 2 - Witness Statements. Photos provided by a volunteer pilot show that the accident pilot was in attendance of at least one of these safety briefings.

⁴ See Attachment 2 - Witness Statements.

⁵ The helicopter operated multiple flights that day. An exact number of flights was not logged and could not be determined.

⁶ Title 14 CFR § 91.3 *Responsibility and authority of the pilot in command* states in part: (a) *The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.* (b) *In an in-flight emergency requiring immediate action, the pilot in command may deviate from any rule of this part to the extent required to meet that emergency.*

passenger in the front right seat was 69 years old and held a commercial pilot rotorcraft helicopter, instrument helicopter certificate dated February 15, 1995.⁷ His last medical certificate was a second class medical dated April 1996.⁸ Passengers were not required to complete paperwork or sign a waiver of liability and signed up on a roster that was maintained by one of the volunteer pilots.⁹

The accident flight departed Logan County Airport about 1630, and the accident occurred about 15 minutes later in the hills east of the airport. No flight plan was filed for the local flight. There were no known witnesses to the accident. According to interviews, the helicopter was equipped with ADS-B but routinely it was never turned on.¹⁰ There were no radar returns for the accident flight.¹¹

The helicopter impacted a rock face about 3.5 nautical miles east of 6L4 and came to rest partially inverted on its right side on an asphalt road. The pilot and five passengers were fatally injured.

The wreckage spanned the 26-ft wide road and continued into a ditch at the base of a rock face. The main wreckage was 542 ft past a utility cable that crossed about 180 ft above the road. Two utility cables were fractured consistent with tensile overload and were displaced toward the main wreckage near the roadside at 220 ft and 397 ft from the remaining utility cable. All major components of the helicopter were in the vicinity of the accident site.

2.0 Pilot Information

The accident pilot was 53 years old and resided in Austin, Texas. He began flying in 1987. He was a private pilot and according to multiple witnesses he had been volunteering for the MARPAT Aviation, LLC reunion flights for four years. According to the MARPAT Aviation, LLC owner, the accident pilot did not have any Huey flight time prior to operating the reunion flights for MARPAT Aviation, LLC.¹²

⁷ The passenger pilot received his certificates based on military competence in the United States Army. On his FAA Form 8710-1 dated June 5, 1986 he indicated he had more than 10 hours as PIC in the UH-1 within the previous 12 months and 50 total flight hours and 0 hours in the last 6 months.

⁸ Witnesses stated that they were not required to show proof of valid medical or pilot certificate to sit in the front right seat and operate the flight controls during the flights.

⁹ The second pilot rated passenger was seated in the cabin of the helicopter.

¹⁰ Automatic Dependent Surveillance-Broadcast (ADS-B) is an advanced surveillance technology that combines an aircraft's positioning source, aircraft avionics, and a ground infrastructure to create an accurate surveillance interface between aircraft and ATC.

¹¹ According to the MARPAT Aviation, LLC owner, ADS-B is only on in the Huey when the position lights are on and that since they were operating during daylight hours, they did not need to turn the position lights on. See Attachment 2 - Witness Statements. The helicopter was not equipped, nor was it required to be equipped, a cockpit voice recorder (CVR) or a flight data recorder (FDR). See 14 CFR 91.609 *Flight data recorders and cockpit voice recorders*.

¹² See Attachment - 1 Interviews.

The accident pilot received a flight review (BFR) as required by 14 *CFR* 61.56 *Flight Review* from his stepson (a certified flight instructor) on June 16, 2022.¹³ Prior to the reunion flights, a volunteer pilot requested copies of each volunteer pilot's medical certificate and the pilot's flight review sign-off. Five pilots provided this information. The accident pilot had sent a photocopy of his flight review sign-off that was dated February 24, 2020.¹⁴

According to his stepson, the accident pilot left Austin on June 17, 2022 and drove to West Virginia, arriving on June 18, 2022.¹⁵ According to the pilot who flew with the volunteer pilots prior to the reunion event, on June 19, 2022 he and the accident pilot conducted some approaches and pedal turns and hovering just to "get to know the aircraft again." MARPAT Aviation, LLC volunteers used the flights to get three takeoffs and landings in the Huey. According to that pilot, he and the accident pilot did not practice any emergency procedures or practice autorotations.¹⁶

A review of the FAA Program Tracking and Reporting Subsystem (PTRS),¹⁷ Safety Performance Analysis System (SPAS), Accident/Incident Data System (AIDS) and Enforcement Information System (EIS) showed no records or reports of any previous aviation accidents or incidents involving the accident pilot.

2.1 The Pilot's Certification Record¹⁸

Private Pilot - Airplane Single Engine Land certificate issued August 26, 1987.

Notice of Disapproval - Private Pilot; Rotorcraft Helicopter issued on January 13, 2003.

¹³ Title 14 *CFR* 61.56 states that no person may act as pilot in command of an aircraft unless, since the beginning of the 24th calendar month before the month in which that pilot acts as pilot in command, that person has accomplished a flight review given in an aircraft for which that pilot is rated by an authorized instructor. The flight review was conducted in a Mooney M20C (N2957L) that was owned by the accident pilot's brother.

¹⁴ It is unknown if MARPAT Aviation, LLC held a copy of the accident pilot's most recent review.

¹⁵ See Attachment 2 - Witness Statements.

¹⁶ See Attachment 2 - Witness Statements.

¹⁷ The Program Tracking and Reporting Subsystem (PTRS) is a comprehensive information management and analysis system used in many Flight Standards Service (AFS) job functions. It provides the means for the collection, storage, retrieval, and analysis of data resulting from the many different job functions performed by Aviation Safety Inspectors (ASIs) in the field, the regions, and headquarters. This system provides FAA managers and inspectors with the current data on airmen, air agencies, air operators, and many other facets of the air transportation system. Source: FAA.

¹⁸ Source: FAA.

Areas of reexamination: Operations I, Tasks F, G, H; Operations II, III, IV, V, VI, VII, IX, X . Applicant was unable to explain - Minimum Equipment List, AOA I, Task E, and Task F Operation of Systems.¹⁹

Private Pilot - Airplane Single Engine Land; Rotorcraft Helicopter certificate issued February 17, 2003.

Private Pilot - Airplane Single Engine Land; Rotorcraft Helicopter; Rotorcraft Gyroplane certificate issued September 12, 2014.²⁰

2.2 The Pilots' Certificates Held at the Time of the Accident²¹

Private Pilot Certificate (Issued September 12, 2014)

Airplane Single Engine Land; Rotorcraft Helicopter, Rotorcraft Gyroplane

Second Class Medical Certificate (Issued June 14, 2021)²²

Limitations: Must have available glasses for near vision.

2.3 The Pilot's Flight Times

Estimated pilot flight times, according to the pilot's logbook:

Total pilot flying time	493.1 ²³
Total Pilot-In-Command (PIC) time	unknown
Total UH-1B flying time	21.1 ²⁴
Total flying time last 24 hours	unknown
Total flying time last 30 days	3.4 ²⁵
Total flying time last 90 days	6.5 ²⁶

¹⁹ The pilot indicated he had a total of 10.1 flight hours solo Pilot in Command time and 39.8 total hours in the Robinson R-22 on his FAA Form 8710-1 dated January 4, 2003. He indicated that he had a total of 186.1 flight hours in airplanes, and 39.8 hours in rotorcraft. See Attachment 4 - Pilot Information.

²⁰ The pilot indicated he had a total of 450 flight hours in airplanes and 250 hours in rotorcraft on his FAA Form 8710-1 dated September 12, 2014.

²¹ Source: FAA.

²² The pilot listed a total of 1,400 hours flight time and 20 hours in the previous 6 months on his FAA Medical Application Form 8500-8 dated June 13, 2021. His medical certificate was issued June 14, 2021.

²³ The accident pilot's logbook only recorded flight times between August 7, 2008 to June 21, 2022. According to his stepson, the accident pilot would not log a lot of his flights in his logbook, particularly after he got his licenses. He said there was a "big chunk of time" where he didn't log flight time, which may be a couple of thousand hours. See Attachment 2- Witness Statements.

²⁴ There was no instructor sign-off for the UH-1 in his logbook, nor was one required.

²⁵ Flight time does not include the day of the accident.

²⁶ He had 6.5 total hours within the last 90 days (4.2 in a Mooney, 2.3 in the UH-1 N98F). He logged at least 4 takeoffs and landings between April 3, 2022 and June 21, 2022.

Total flying time last 12 months 27.0

According to the accident pilot's logbook, he began flying N98F in June 2020 (8.0 hours), then again in June 2021 (10.8 hours), and finally in June 2022 (2.3 hours).

3.0 Medical and Pathological

The accident pilot had eight prior FAA medical exams from a 1987 third class exam through a 2014 third class exam. His most recent exam was a second class medical dated June 14, 2021. On his most recent exam the pilot reported his occupation as "Software Engineer - Fusion Constructive LLC." The pilot reported civil flight experience that included 1,400 total hours and 20 hours in last six months. The pilot reported a medical history that included an appendectomy in 1996 and treatment at an Urgent Care facility March 2021 for right foot gout.

An autopsy was conducted by the Office of the Chief Medical Examiner in Charleston, West Virginia. Toxicology testing was conducted by the FAA Civil Aerospace Medical Institute (CAMI) in Oklahoma City, Oklahoma.

4.0 Helicopter Information



Figure 1: Accident helicopter N98F.²⁷

According to FAA airworthiness records, the Wilco Aviation (Bell) helicopter, serial number 488 (62- 1968), was manufactured by Bell Helicopter in 1962. It was powered by a T53-L11D turbo-shaft engine.²⁸

A review of maintenance records showed that the helicopter's most recent annual inspection was completed March 29, 2022, at a total time of 9,029.3 hours and engine total time of 5,997 hours, and 569.0 hours since engine overhaul.

The registered owner of N98F was a friend of the MARPAT Aviation, LLC owner and resided in Princeton, West Virginia.²⁹ The registered owner was not affiliated with MARPAT Aviation, LLC.

²⁷ Source: [n98f helicopter - Google Search](#).

²⁸ See Attachment 6 - N98F Registration Information.

²⁹ The current owner of N98F purchased the helicopter from Tim Skip, Inc. on October 24, 2013. MARPAT Aviation, LLC continued to operate the helicopter.

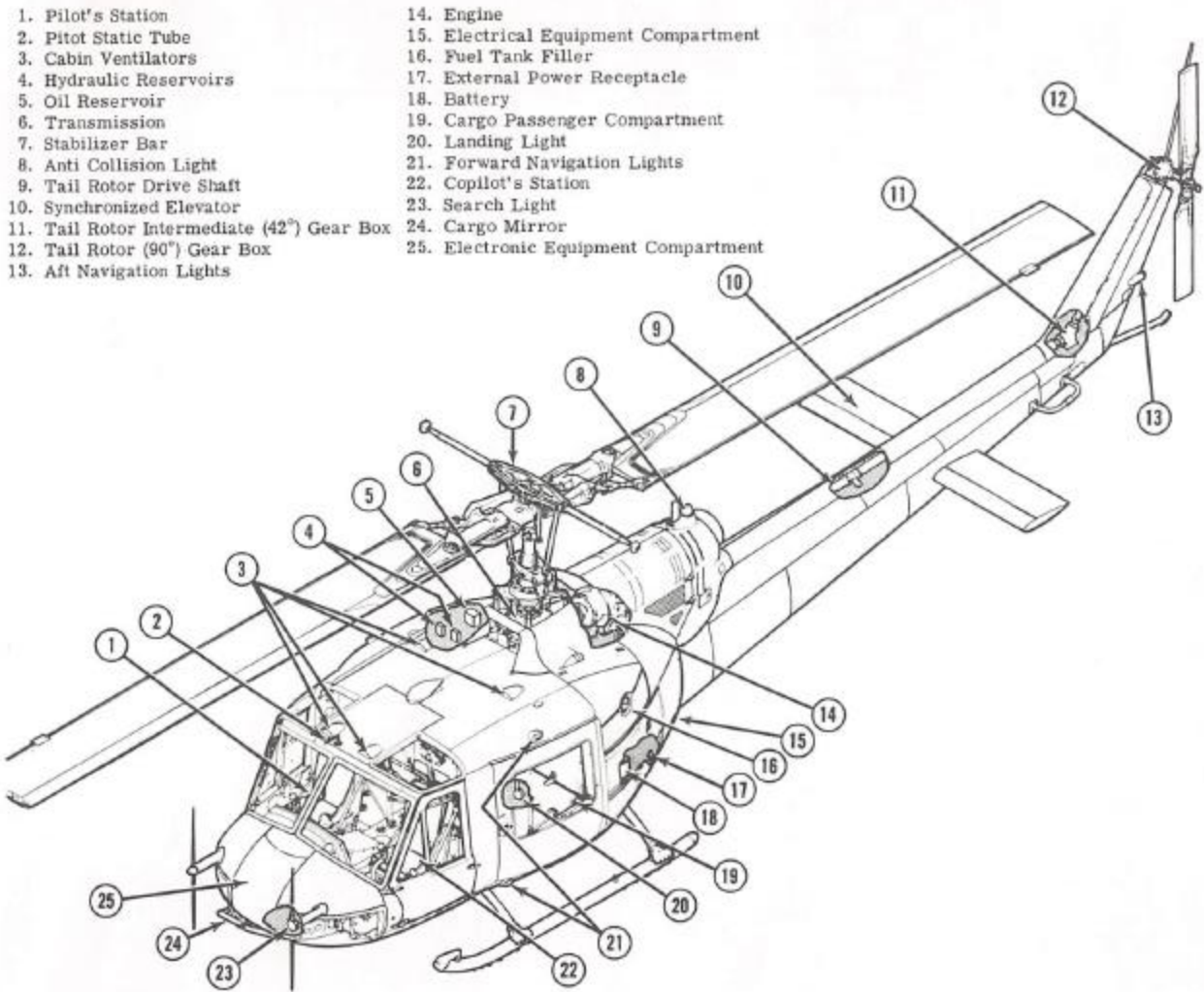


Figure 2: General configuration of UH-1B.³⁰

4.1 N98F Airworthiness Certificate

The helicopter was issued a special experimental exhibition airworthiness certificate dated December 5, 2014. An airworthiness certificate is an FAA document which grants authorization to operate an aircraft in flight. There are two different classifications of FAA airworthiness certificates: standard airworthiness certificate, and special airworthiness certificate. Two types of special airworthiness certificates are restricted and experimental.³¹

³⁰ Source: Department of Army Technical Manual, UH-1B Part I Operator's Manual TM55-1520-211-10, dated June 1, 1965.

³¹ Other types of special airworthiness certificates are primary, multiple, limited, light-sport, special flight permit, and provisional. For additional information on the various types of Special Airworthiness Certificates, see FAA Order 8130.2G (CHG 1) *Airworthiness Certification of Aircraft and Related Products*, dated July 2, 2012.

According to the FAA, a restricted category special airworthiness certificate is issued to operate aircraft that have been type certificated in the restricted category. Operation of restricted category aircraft is limited to special purposes identified in the applicable type design. These special purpose operations include the following:

- *Agricultural (spraying, dusting, seeding, and livestock and predatory animal control).*
- *Forest and wildlife conservation.*
- *Aerial surveying (photography, mapping, and oil and mineral exploration).*
- *Patrolling (pipelines, power lines, and canals).*
- *Weather control (cloud seeding).*
- *Aerial advertising (skywriting, banner towing, airborne signs, and public address systems).*
- *Any other operation specified by the Administrator.*³²

A special airworthiness certificate in the experimental category is issued to operate an aircraft that does not have a type certificate or does not conform to its type certificate and is in a condition for safe operation.³³ Additionally, this certificate is issued to operate a primary category kit-built aircraft that was assembled without the supervision and quality control of the production certificate holder.

Special airworthiness certificates may be issued in the experimental category for the following purposes:

- *Research and development: to conduct aircraft operations as a matter of research or to determine if an idea warrants further development. Typical uses for this certificate include new equipment installations, operating techniques, or new uses for aircraft.*
- *Showing compliance with regulations: to show compliance to the airworthiness regulations when an applicant has revised the type certificate design data or has applied for a supplemental type certificate or field approval.*
- *Crew training: for training the applicant's flight crews in experimental aircraft for subsequent operation of aircraft being flight tested in type certificate programs or for production flight testing.*

³² Source: [Special Airworthiness Certificate | Federal Aviation Administration \(faa.gov\)](https://www.faa.gov/licenses_certificates/airworthiness_certificates/special-airworthiness-certificates).

³³ Title 14 CFR 21.41 Type Certificate states: *Each type certificate is considered to include the type design, the operating limitations, the certificate data sheet, the applicable regulations of this subchapter with which the FAA records compliance, and any other conditions or limitations prescribed for the product in this subchapter.*

- *Exhibition: to exhibit an aircraft's flight capabilities, performance, or unusual characteristics for air shows, motion pictures, television, and similar productions, and for the maintenance of exhibition flight proficiency.*
- *Air racing: to operate an aircraft in air races, practice for air races, and to fly to and from racing events.*
- *Market surveys: to conduct market surveys, sales demonstrations, and customer crew training for U.S. manufacturers of aircraft or engines.*
- *Operating amateur-built, kit-built, or light-sport aircraft*
- *Special Airworthiness Certificate, Experimental Category for Unmanned Aircraft Systems (UAS) and Optionally Piloted Aircraft (OPA)*³⁴

Experimental exhibition aircraft are to exhibit an aircraft's flight capabilities, performance, or unusual characteristics for air shows, motion pictures, television, and similar productions, and for the maintenance of exhibition flight proficiency.³⁵

Tim Skip, Inc. purchased N98F from San Joaquin Helicopters in California on November 6, 2003, and MARPAT Aviation, LLC began flying the helicopter under a contract with West Virginia for firefighting services. During the firefighting season MARPAT Aviation, LLC would leave N98F under a restricted airworthiness certificate, and during the off-season they would move the airworthiness certificate back to an experimental airworthiness certificate so they could participate in "some fairs and festivals and stuff like that."³⁶ Due to lack of flying opportunities under the state contract, the owner of MARPAT Aviation, LLC moved N98F to an experimental airworthiness certificate permanently in 2014.

According to FAA records, the N98F airworthiness certificate was moved in and out of restricted and experimental categories as follows (operator identified in parenthesis):

- December 5, 2014 N98F Restricted Category to Experimental. (MARPAT)
- October 29, 2013 Experimental to Restricted³⁷ (MARPAT)
- May 17, 2013 Restricted to Experimental³⁸ (MARPAT)
- April 10, 2013 Experimental to Restricted (MARPAT)
- May 15, 2012 Restricted to Experimental (MARPAT)
- September 24, 2010 Experimental to Restricted (MARPAT)
- May 21, 2010 Restricted to Experimental (MARPAT)

³⁴ Also see 14 CFR 21.191 *Experimental Certificates*.

³⁵ Source: [Experimental Category | Federal Aviation Administration \(faa.gov\)](https://www.faa.gov/experimental-category).

³⁶ See Attachment 5 - N98F Airworthiness Records.

³⁷ Restricted Category Aircraft Operating Limitations were issued for N98F on October 29, 2013.

³⁸ Experimental Exhibition Operating Limitations were issued for N98F on May 17, 2013.

- November 20, 2003 Experimental to Restricted³⁹ (MARPAT)
- April 7, 1995 Restricted to Experimental (San Joaquin Helicopters in Delano, CA)
- July 24, 1984 Experimental to Restricted (San Joaquin Helicopters in Delano, CA)⁴⁰

On May 11, 2010 and October 25, 2013 the owner of N98F wrote a letter to the MARPAT Aviation, LLC owner (which was also provided to the FAA) indicating that the owner of MARPAT Aviation, LLC was the "Agent of Service" for "any and all matters concerning N98F."⁴¹

The helicopter was insured when it previously was operated as a restricted category aircraft and under contract with West Virginia for firefighting services. After N98F was moved back to an experimental category aircraft in 2014 and at the time of the accident, the helicopter was not insured.

5.0 Weight and Balance

There was insufficient evidence to calculate an estimated weight and balance of the helicopter on the accident flight.

6.0 Airport Information

Logan County Airport (6L4) was located about four miles east of Logan, West Virginia at an elevation of 1,666.4 mean sea level (msl) and a latitude/longitude of 37-51-20.4700N 081-54-57.1800W. The airport did not have an air traffic control (ATC) control tower.

The airport was served by a single asphalt runway designated runway 06/24. The runway was 3,605 feet long and 75 feet wide and the helipad was listed as permanently closed.

³⁹ The Acknowledge of Special Operating Limitations was signed on November 20, 2003 by the MARPAT Aviation, LLC "chief pilot."

⁴⁰ The helicopter was sold to San Joaquin Helicopters in Delano, California by Southern Helicopters, Inc. in Ozark, Alabama on November 13, 1981. Southern Helicopters had purchased the helicopter from the Laurel-Jones County Civil Defense Council in Mississippi on October 20, 1981.

⁴¹ See Attachment 5 - N98F Airworthiness Records.

LOGAN CO (6L4) 4 E UTC-5(-4DT) N37°51.34' W81°54.95' CINCINNATI
L-26H
IAP
 1666 B NOTAM FILE EKN
RWY 06-24: H3605X75 (ASPH) MIRL 0.3% up NE
RWY 06: REIL. PAPI(P2L)—GA 3.0° TCH 47'. Trees.
RWY 24: REIL. PAPI(P2L)—GA 3.0° TCH 42'. Trees.
SERVICE: S4 FUEL 100LL, JET A LGT ACTIVATE MIRL Rwy 06-24, REIL Rwy 06 and Rwy 24, PAPI Rwy 06 and Rwy 24—CTAF.
AIRPORT REMARKS: Attended irregularly. 24 hr self-serv with credit card. Deer and wildlife on and in/ovf arpt. Airframe repairs: For svc call 304-752-0094 days, 304-946-4415 nights. Rwy 06, 30 ft hill 800 ft from thld left. No vehicular access to fld without prior arrangement. Rwy 24 blasting 1-2 nautical miles from end of rwy. Irregularly sched. Airport access code—CTAF. Helipad clsd permanently. 4300 ft X 150 ft military practice rwy across Rwy 24 apch 1.2 miles NE oriented 11-29. Rwy 06 and Rwy 24 mkg faded. Wind indicator ws not vertical, wind indications unreliable.
AIRPORT MANAGER: 304-752-0975
WEATHER DATA SOURCES: AWOS-3PT 119.375 (304) 752-0814.
COMMUNICATIONS: CTAF 122.9
 (R) CHARLESTON APP/DEP CON 119.2 (North)
 INDIANAPOLIS CENTER APP/DEP CON 126.575 (South)
CLEARANCE DELIVERY PHONE: For CD ctc Charleston Apch at 304-344-5867 ext 281.
RADIO AIDS TO NAVIGATION: NOTAM FILE CRW.
CHARLESTON (H) (H) VOR/DME 117.4 HVQ Chan 121 N38°20.98' W81°46.19' 196° 30.4 NM to fld. 1099/3W.
 VOR unusable:
 185°-190°
 240°-250°
 DME unusable:
 230°-240°

Figure 3: FAA Airport Facilities Directory information on Logan County Airport.

In the 2020 Aviation Economic Impact Study (AEIS) issued by the state of West Virginia (dated June 2021), the portion of the study concerning Logan County Airport (6L4) stated the following:⁴²

Logan County Airport is one of 17 GA [general aviation] facilities in West Virginia's aviation system. GA airports serve as integral gateways to communities across the state and accommodate activities such as emergency medical operations, business and recreational operations, mail and cargo transportation, remote access, and many more. The airport is classified by the FAA as a Nonprimary - Basic airport and is eligible for federal aviation funding through the Airport Improvement Program (AIP).

Given the nickname "the friendliest town in West Virginia," Logan is home to the Logan County Airport. The airport is a general aviation (GA) facility that serves

⁴² A Note in the Final Report stated the following: *The preparation of this document was supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration (FAA) as provided under Title 49, U.S.C., Section 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate the proposed development is environmentally acceptable or would have justification in accordance with applicable public laws.*

the surrounding business community, the Air National Guard, and recreational flyers. The Air National Guard is located off-airport nearby, and uses the airport for a number of trainings including dark operations. The airport has developed a strong relationship with the nearby community and hosts an annual Veteran Reunion Fly-In. Members of the community and veterans travel from all over the region for the event, particularly to see the UH-1B "Huey" Helicopter, nicknamed "Miss Fit," that served in the Vietnam War. The veteran helicopter is owned by Marpat Aviation, a Federal Aviation Administration (FAA)-certified Part 145 Repair Station located at the airport, and is on display for airport visitors.

6.1 FAA Sectional Chart

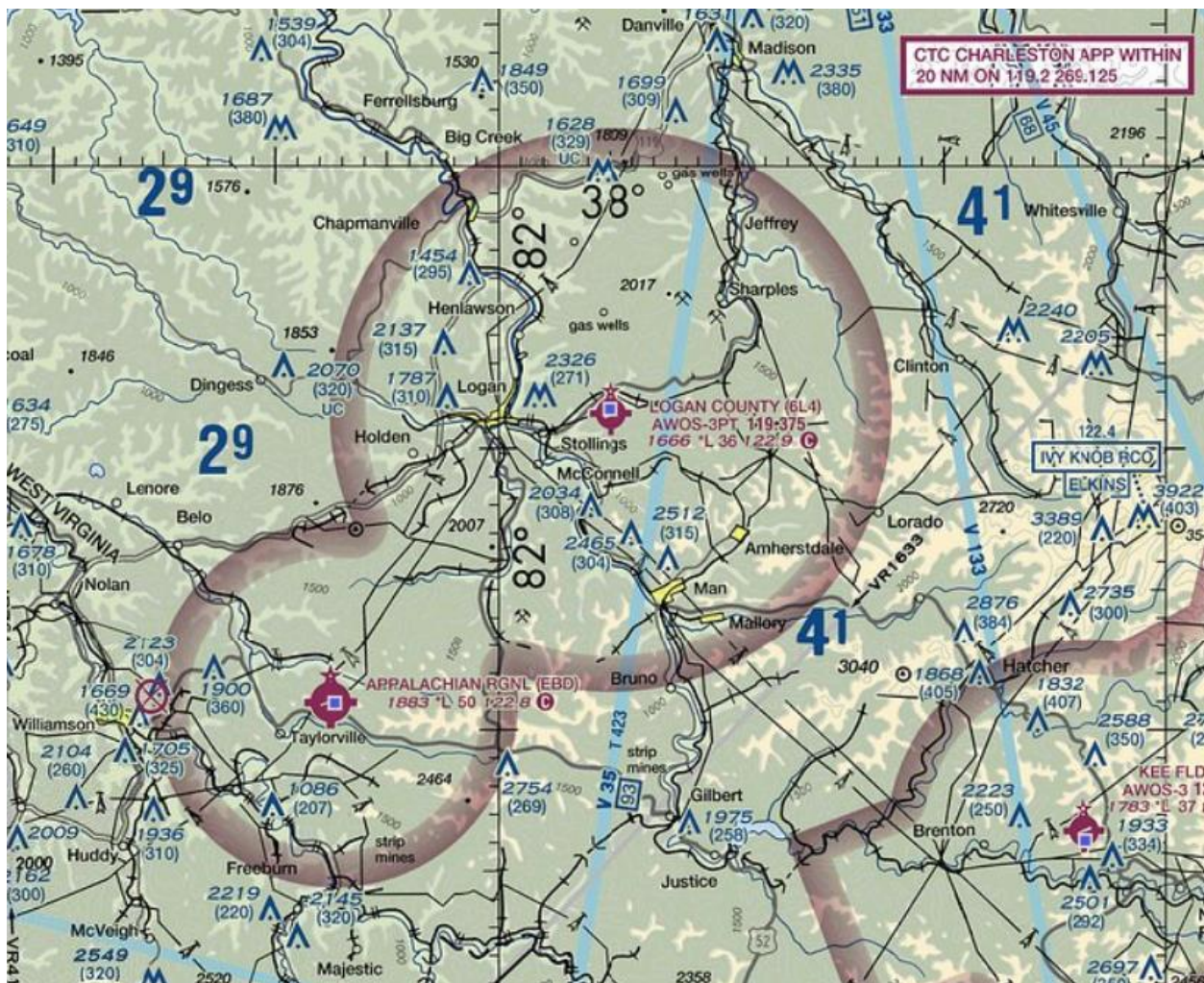


Figure 4: FAA sectional chart showing Logan County Airport (6L4).

7.0 Meteorological Information

The weather reporting station at Logan County Airport recorded weather at 1645 included scattered clouds at 4,900 ft above ground level, visibility 10 statute miles, and wind variable at 6 kts. The temperature was 32° C and a dew point of 21° C; and the altimeter setting was 30.00 inches of mercury.

8.0 Company Information



Figure 5: Photo of MARPAT Aviation, LLC Aviation office at Logan County Airport.

MARPAT Aviation, LLC was incorporated in West Virginia on September 22, 2003 and was operated by the owner of the company.⁴³ The company had one employee who was a mechanic for the company's Part 145 repair station certificate (#ZWMR912K).⁴⁴ The company did not hold an FAA operating certificate.

According to the MARPAT Aviation, LLC owner, the company had been conducting similar reunion events for the 7 years preceding the accident flight. He

⁴³ Source: [MARPAT AVIATION LLC :: West Virginia \(US\) :: OpenCorporates](#).

⁴⁴ The mechanic was the owner's son.

used about six pilot volunteers to help fly the reunion flights and handle logistics for the event. He said the accident pilot was the one who “took care of the website.” One of the volunteer pilots was responsible for maintaining a list of pilots who flew the reunion flights. That volunteer pilot also handled the sign-in sheet for passengers.

According to the owner of MARPAT Aviation, LLC, the volunteer pilots would come in and get “current” in the helicopter with another pilot, obtaining 3 takeoffs and landings in the Huey.

The MARPAT Aviation, LLC owner characterized the reunion flights as “exhibition flights” by “exhibiting a historical helicopter.” None of the reunion flights were coordinated with the FAA Flight Standards District Office (FSDO) in Charleston, West Virginia, and the owner said it was not required “as far as I know.”⁴⁵

The company did not have standard operating procedures (SOPs) for the helicopter. The company also did not have a safety management system (SMS).⁴⁶

According to FAA records, the owner of MARPAT Aviation, LLC held an FAA repairman certificate dated November 3, 2009.⁴⁷ The owner also held a private pilot’s license with an airplane single engine land rating, dated January 2010. His last medical certificate was a third class, dated July 2004, with limitation that he must have available glasses for near vision. The owner did not hold a helicopter category rating.

On March 7, 2011 the owner of MARPAT Aviation, LLC had his private pilot license suspended after the FAA discovered he was involved in flying a helicopter (N98F) without a helicopter category rating or valid medical certificate.⁴⁸

8.1 MARPAT Aviation, LLC Flight Routes

According to the MARPAT Aviation, LLC owner, the volunteer pilots used one of two routes for the reunion flights, depending upon the amount of time a passenger

⁴⁵ See Attachment 1 - Interviews.

⁴⁶ FAA Advisory Circular (AC) 120-92B *Safety Management Systems for Aviation Service Providers*, provides a description of regulatory requirements, guidance and methods of developing and implementing an SMS. An SMS is an organization-wide comprehensive and preventive approach to managing safety, and includes a safety policy, formal methods for identifying hazards and mitigating risk, and promotion of a positive safety culture. An SMS also provides assurance of the overall safety performance of an organization. SMS is currently required for Part 121 operators. The AC also states the following: “This AC may also be helpful if you hold a certificate other than part 121 or are not certificated because this AC can be used to voluntarily develop and implement an SMS.”

⁴⁷ The owner’s repairman certificate had the following limitations: *Certificate privileges of 14 CFR Section 65.103 valid for inspection and return to service while employed by MARPAT Aviation LLC of Switzer, West Virginia Certificate No. ZWMMR912K.*

⁴⁸ See Attachment 3- FAA Interview Summaries.

paid for. Copies of the routes were posted in the MARPAT Aviation, LLC office. There were no altitude restrictions listed on the routes, and the MARPAT Aviation, LLC owner said that there was no speed restriction when the helicopter doors were closed, and a 70 knot restriction if the doors were open. He believed the doors were open on the accident flight.

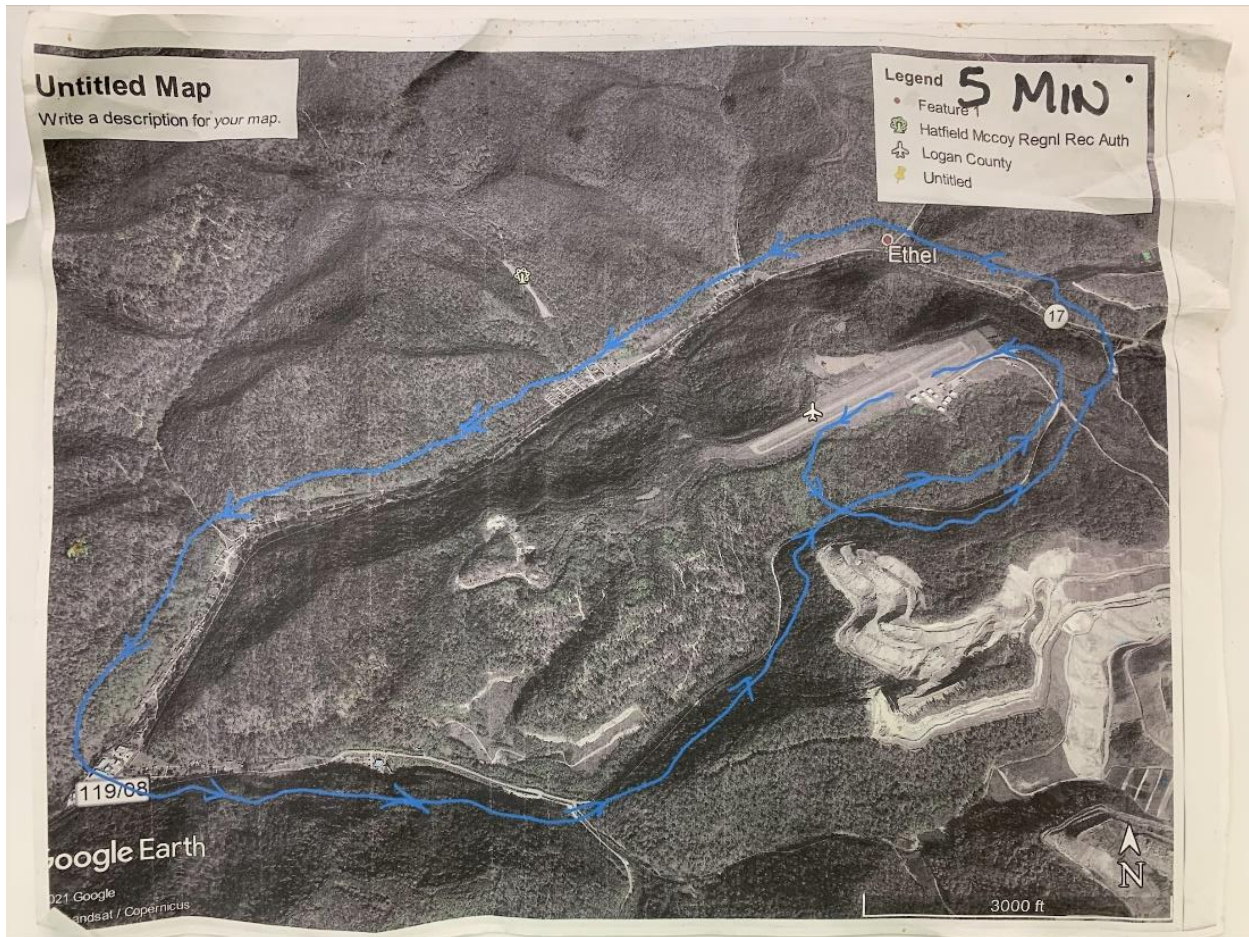


Figure 6: MARPAT Aviation, LLC 5-minute route.⁴⁹

⁴⁹ Source: MARPAT Aviation, LLC.

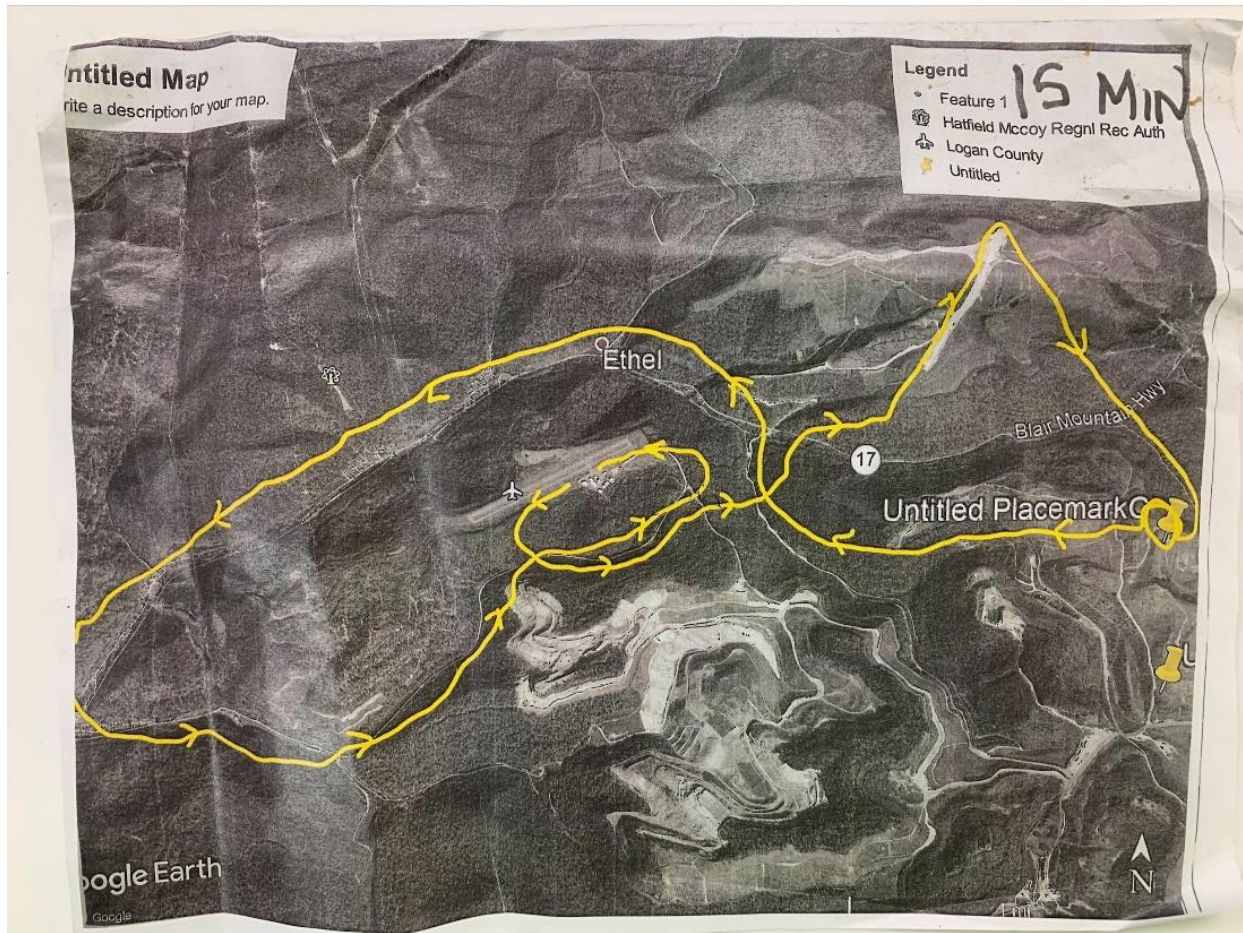


Figure 7: MARPAT Aviation, LLC 15-minute route.⁵⁰

⁵⁰ Source: MARPAT Aviation, LLC. According to witnesses, for 30-minute flights volunteer pilots would typically fly the 15-minute route twice.

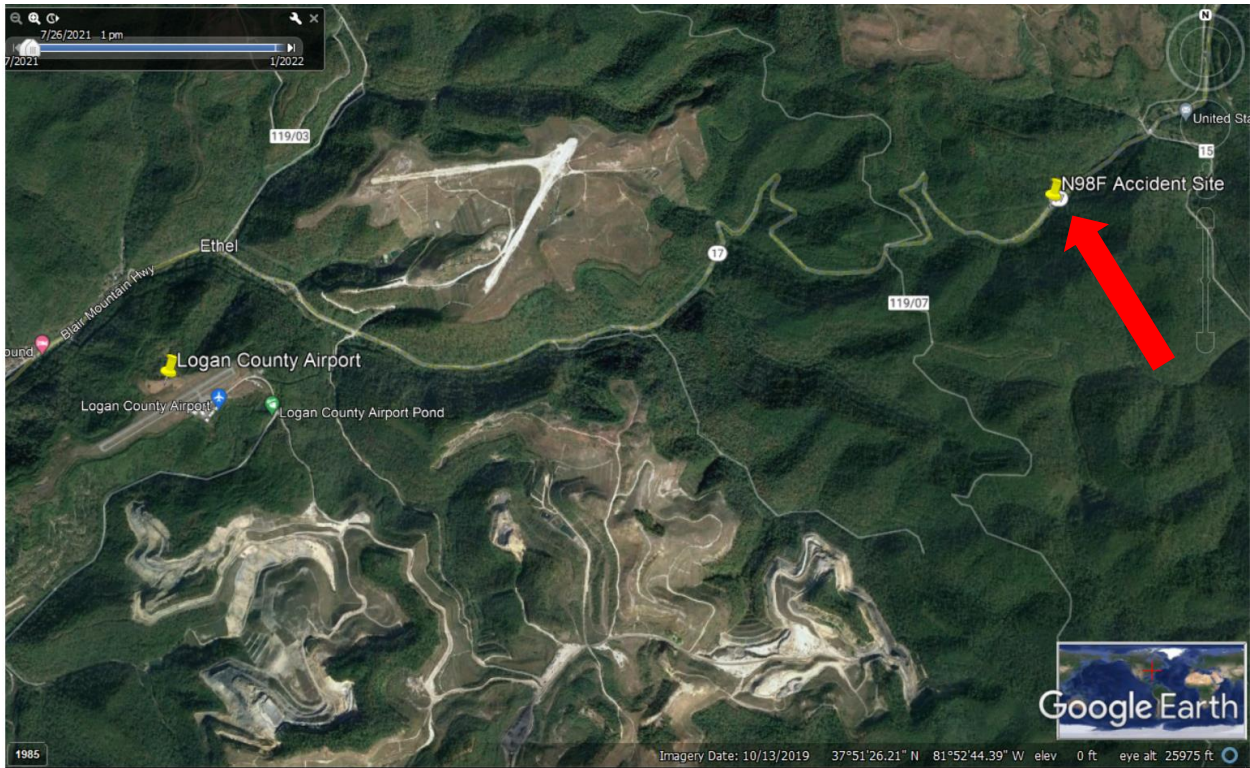


Figure 8: Google Earth image showing N98F accident site (red arrow).⁵¹

Title 14 CFR 91.119 *Minimum safe altitudes: General* stated the following:

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

- (a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.*
- (b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.*
- (c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.*

⁵¹ The accident location was approximately 1 1/2 miles to the east of the 15-minute route's most eastern leg. Elevation of the accident site was 1,167 ft above mean sea level. The investigation found numerous YouTube videos of N98F flight operating within the valleys of West Virginia surrounding Logan County Airport. For example, see <https://www.youtube.com/watch?v=rJp1xt2X2AY&t=711s> and https://www.youtube.com/watch?v=3l_D33DXGe4.

(d) Helicopters, powered parachutes, and weight-shift-control aircraft. If the operation is conducted without hazard to persons or property on the surface -

(1) A helicopter may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA; and

(2) A powered parachute or weight-shift-control aircraft may be operated at less than the minimums prescribed in paragraph (c) of this section.

9.0 Relevant Procedures

Due to extensive damage, the investigation was unable to determine what pilot manuals were contained onboard N98F at the time of the accident. Pilot guidance and procedures were referenced by the investigation from the Department of Army Technical Manual, UH-1B Part I Operator's Manual TM55-1520-211-10, dated June 1, 1965, and the Department of Army Technical Manual, UH-1B Pilot's Checklist TM55-1520-211-10CL, dated June 18, 1964.⁵²

For UH-1B normal and emergency procedures, see Attachment 8 - Army UH-1B Technical Manual Excerpts. For UH-1B normal and emergency pilot checklists, see Attachment 9 - Army UH-1B Pilot Checklist.

F. FAA OVERSIGHT

FAA oversight of the MARPAT Aviation, LLC Part 145 repair station certificate was conducted by the Charleston, West Virginia FSDO office (AFG-200-EA-09). The FSDO was staffed with a FLM, one PMI and an assistant PMI, one principal avionics inspector (PAI), a principal operations inspector (POI) and an operations inspector in training. The FSDO had three vacancies for inspectors.

According to the FSDO FLM, the office was responsible for 12 Part 145 repair station certificates, 3 Part 135 commuter and on-demand certificates, 2 Part 133 rotorcraft external-load certificates, 2 Part 141 pilot school certificates, and 2 Part 147

⁵² A safety pilot who flew during the reunion provided the NTSB a copy of a checklist he used when flying the UH-1B. It is not known if the accident pilot used this checklist or the Army Technical Manual, UH-1B Pilot's Checklist on the accident flight. See Attachment 10 - Safety Pilot's UH-1B Checklist.

aviation maintenance technician schools. They also had 50 Part 91 letters of authorization (LOAs).⁵³ The FSDO did not manage any Part 121 air carriers.⁵⁴

The FSDO service area covered 15 counties in West Virginia. According to the FLM, the geographic coverage area for the office and the time it took to travel the state was their biggest challenge.⁵⁵



Figure 9: Charleston, West Virginia FAA FSDO service area.

The PMI first learned about MARPAT Aviation, LLC about 2004 when the company had an external lift Part 133 application with the FAA. MARPAT Aviation, LLC held the certification until it was revoked on April 15, 2014.⁵⁶

⁵³ Some operations (e.g., Reduced Vertical Separation Minimum (RVSM), North American Free Trade Agreement (NAFTA), and Category (CAT) II) require approved LOAs, which include additional operational and maintenance requirements. Source: FAA.

⁵⁴ See Attachment 3 - FAA Interview Summaries.

⁵⁵ See Attachment 3 - FAA Interview Summaries.

⁵⁶ According to the PMI, the revocation was handled by the POI at the time and involved the requirement to have a rotorcraft load combination flight manual at MARPAT Aviation, LLC. There also was an issue with the new chief pilot to complete a knowledge and skills test before becoming a chief pilot. The previous chief pilot subsequently resigned. The PMI said MARPAT Aviation, LLC did not have a chief

The MARPAT Aviation, LLC owner said the last time the PMI was at their facility was about 2 years prior to the accident for an inspection of the repair station. He said a “delegated” inspector from the FAA was at their facility for an inspection in March or April of 2022. According to FAA records, the PMI’s last surveillance visit to MARPAT Aviation, LLC was on May 2, 2019.

According to FAA records, the last surveillance visit to MARPAT Aviation, LLC by the FSDO was on May 3, 2022 by another inspector at the FSDO (other than the PMI) surveilling the company’s Part 145 repair station. The PMI said that he was on and off as PMI for a while, but all required surveillance activities were completed on MARPAT Aviation, LLC for their Part 145 repair station certificate.

When asked who within this FSDO was responsible for ensuring compliance with this experimental exhibit operating limitation, the PMI said there is no requirement in the work program for experimental aircraft scheduled oversight. Random surveillance was based on observation and surveillance was no different than any other Part 91 operation.

According to the FAA, the Charleston, West Virginia FSDO was not aware that MARPAT Aviation, LLC was conducting the reunion flights with N98F while soliciting required donations for fuel cost.⁵⁷

9.1 FAA Experimental Exhibit Certificate Data⁵⁸

According to the FAA, there are 3,717 aircraft that hold experimental exhibit limitations. This represents less than 1% of the total various certificates issued by the FAA (288,030 total certificates). Of the 3,717 aircraft that hold experimental exhibit limitations, 217 are rotorcraft (6%) and 53 of those rotorcraft are UH-1 Huey helicopters (24%).

The Charleston, West Virginia FSDO office (AFG-200-EA-09) was responsible for a total of six aircraft that had an experimental exhibit limitation. Of those six aircraft, the accident helicopter was the only rotorcraft the FSDO geographically had oversight responsibility for.

pilot for more than 17 months. According to the FAA, MARPAT Aviation, LLC also did not establish a chief pilot within 30 days, and MARPAT Aviation, LLC had refused to make corrections to these deficiencies. See Attachment 3 - FAA Interview Summaries.

⁵⁷ See Attachment 3 - FAA Interview Summaries.

⁵⁸ Source: FAA email to the NTSB sent November 21, 2022.

9.2 MARPAT Aviation, LLC Donations

According to the MARPAT Aviation, LLC owner, individuals were offered 30-minute rides for a suggested donation to ride in the back of the helicopter or could pay a "required" \$250 donation to cover the cost of fuel for a 30-minute flight and operate the helicopter from the front right seat.⁵⁹ Checks and credit card transactions were made to MARPAT Aviation, LLC.

MARPAT Aviation, LLC was not associated with any 501(c)(3) charitable organization.⁶⁰ The owner of MARPAT Aviation, LLC stated that the reunion flights (including the accident flight) were operated under Part 91.⁶¹

A website for MARPAT Aviation, LLC included the following information for individuals wishing to participate in the event:⁶²

- *Take the right seat and YOU can fly N98F!*
- *You DO NOT need to be a pilot to make a reservation to fly!*

⁵⁹ Logan County Airport records showed that on June 23, 2022 MARPAT Aviation, LLC paid for 1,906.05 gallons of Jet A fuel associated with the operation of N98F during the 2022 reunion flights. The owner of MARPAT Aviation, LLC told the NTSB he would allow a passenger to ride in the front left seat if they had not paid the "required" \$250 "donation." There was no evidence this occurred for the reunion flights in 2022. See Attachment 1 - Interviews.

⁶⁰ According to the Internal Revenue Service (IRS), to be tax-exempt under section 501(c)(3) of the Internal Revenue Code, an organization must be organized and operated exclusively for exempt purposes set forth in section 501(c)(3), and none of its earnings may inure to any private shareholder or individual. In addition, it may not be an action organization, i.e., it may not attempt to influence legislation as a substantial part of its activities, and it may not participate in any campaign activity for or against political candidates. Organizations described in section 501(c)(3) are commonly referred to as charitable organizations. Organizations described in section 501(c)(3), other than testing for public safety organizations, are eligible to receive tax-deductible contributions in accordance with Code section 170. The organization must not be organized or operated for the benefit of private interests, and no part of a section 501(c)(3) organization's net earnings may inure to the benefit of any private shareholder or individual. If the organization engages in an excess benefit transaction with a person having substantial influence over the organization, an excise tax may be imposed on the person and any organization managers agreeing to the transaction. See [Exemption Requirements - 501\(c\)\(3\) Organizations | Internal Revenue Service \(irs.gov\)](#).

⁶¹ Title 14 CFR 91.146 - *Passenger-carrying flights for the benefit of a charitable, nonprofit, or community event* states that passenger carrying flights for the benefit of a charitable, nonprofit, or community event are not subject to the certification requirements of part 119. A charitable event means an event that raises funds for the benefit of a charitable organization recognized by the Department of the Treasury whose donors may deduct contributions under section 170 of the Internal Revenue Code (26 U.S.C. Section 170).

⁶² See Attachment 11 - MARPAT Website Information. According to FAA Advisory Circular (AC) 120-12A (dated April 24, 1986) a carrier becomes a common carrier when it "holds itself out" to the public or a segment of the public as willing to furnish transportation within the limits of its facilities to any person who wants it. There are four elements in defining a common carrier; (1) a holding out of a willingness to (2) transport persons or property (3) from place to place (4) for compensation. The AC further stated that "carriage for hire which does not involve 'holding out' is private carriage."

- *Reservations will be for a 30-minute flight. Each right seat flight requires a \$250/30-minute donation to pay for fuel.*
- *You can book as many 30-minute flights as you wish, but in fairness to all, we ask that you do not book back-to-back flights.*
- *Please spread your 30-minute flights out over the day and/or the week.*
- *We ask that you provide as much contact information as possible: name, cell phone, email.*

Title 14 CFR 1.1 *General definitions* defines a commercial operator as follows:

Commercial operator means a person who, for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property, other than as an air carrier or foreign air carrier or under the authority of Part 375 of this title. Where it is doubtful that an operation is for "compensation or hire", the test applied is whether the carriage by air is merely incidental to the person's other business or is, in itself, a major enterprise for profit.

Title 14 CFR 119.1 addresses the applicability of certification requirements for air carriers and commercial operators. As a general rule, aircraft operators conducting commercial operations must be certificated under Part 119 prior to engaging in transportation of passengers or property for compensation or hire and hold an air operator certificate issued by the FAA and operate under Parts 121, 125, or 135.

Title 14 CFR 119.1 (e)(2) provided an exception to the requirement for an operating certificate for certain nonstop commercial air tours conducted in an airplane or helicopter. An LOA with the FAA issued under 14 CFR 91.147 was required to operate under Part 91 with this exception. MARPAT Aviation, LLC did not have a Part 91.147 LOA with the FAA at the time of the accident.

On November 17, 2014 the MARPAT Aviation, LLC owner wrote the FAA requesting that N98F be taken out of restricted category and put into experimental category, stating "we intend to exhibit the Huey at veterans [sp] functions and events around the area." The accident helicopter (N98F) was issued experimental exhibition operating limitations on December 5, 2014.

Title 14 CFR 91.319 *Aircraft having experimental certificates: Operating limitations* states the following, in part:

- (a) *No person may operate an aircraft that has an experimental certificate -*
 - (1) *For other than the purpose for which the certificate was issued; or*

(2) *Carrying persons or property for compensation or hire.*⁶³

10.0 FAA Program Letter

FAA records show that the MARPAT Aviation, LLC owner signed an "Acknowledgment of Special Operating Limitations" letter to the FAA certifying that he "read and understanding the Special Operating Limitations which are part of the Special Airworthiness Certificate, FAA Form 8130-7, issued 12/05/2014" for N98F.⁶⁴

Title 14 *CFR* 21.193 *Experimental certificates: general* states the following in part:

An applicant for an experimental certificate must submit the following information:

(a) A statement, in a form and manner prescribed by the FAA setting forth the purpose for which the aircraft is to be used.

(b) Enough data (such as photographs) to identify the aircraft.

(c) Upon inspection of the aircraft, any pertinent information found necessary by the FAA to safeguard the general public.

(d) In the case of an aircraft to be used for experimental purposes -

(1) The purpose of the experiment;

(2) The estimated time or number of flights required for the experiment;

(3) The areas over which the experiment will be conducted; and

(4) Except for aircraft converted from a previously certificated type without appreciable change in the external configuration, three-view drawings or three-view dimensioned photographs of the aircraft.

According to the FAA, program letters are provided to the FAA by the operator and are used to document and control the special purpose operation that the special airworthiness (experimental) certificate has been issued for. A program letter must be specific as to the intended use under the special purpose requested, including names, dates, and locations of airshows, air races, or exhibition activities that will be attended.

⁶³ See Attachment 13 - FAA Legal Interpretation.

⁶⁴ See Attachment 5 - N98F Airworthiness Records.

The operator's program letter should state a reasonable schedule of events to be attended but should not list events that would obviously be impossible to attend, for example, listing all airshows scheduled in the United States for the upcoming year.⁶⁵

Applicants should be advised that the program letter is subject to review by the FAA and that the owner/operator must notify the local FSDO by letter or fax of any amendments to the proposed schedule prior to that flight. Applicants that do not submit a specific program letter do not meet the intent of FAR 21.193 and shall not be issued a special airworthiness certificate.⁶⁶

The NTSB requested all program letters sent by MARPAT Aviation, LLC to the FAA. The FAA provided two program letters it had received from MARPAT Aviation, LLC, one from 2018 and one from 2021.

On December 12, 2018, the owner of MARPAT Aviation, LLC sent the Charleston, West Virginia FSDO an email notifying that N98F would be used for a Christmas celebration in downtown Logan, West Virginia that year. On August 2021, the owner of MARPAT Aviation, LLC sent the FAA a signed letter stating that N98F would be used for a veteran's function and golf tournament between September 10-12, 2021 and for a VFW function in Pikeville, Kentucky on October 15, 2021.⁶⁷

The FAA did not have a program letter for 2022 activities involving N98F nor any correspondence from MARPAT Aviation, LLC indicating that N98F would be used for the reunion event that involved the accident.

According to the PMI for MARPAT Aviation, LLC, it was the owner/operator's responsibility to notify the FSDO per the limitations, and the owner/operator was responsible for notifying the FSDO of the required events.⁶⁸

According to the MARPAT Aviation, LLC owner, the 2022 reunion event was not required to be listed since it occurred at the helicopter's "homebase" and was continuously on exhibit there. He said that the experimental limitations only applied when the aircraft was exhibited someplace other than the homebase and believed there was a 15-mile radius around Logan where they could operate without notifying the FAA.⁶⁹

⁶⁵ Source: [FAA Program Letter \(faa-aircraft-certification.com\)](https://www.faa-aircraft-certification.com).

⁶⁶ Source: [FAA Program Letter \(faa-aircraft-certification.com\)](https://www.faa-aircraft-certification.com).

⁶⁷ See Attachment 12 - MARPAT Program Letters (2014-2022).

⁶⁸ See Attachment 3 - FAA Interview Summaries.

⁶⁹ See Attachment 1 - Interviews.

When the MARPAT Aviation, LLC PMI was asked about the operating limitations for N98F, he said there was no reference to a mileage range from outside the home base in the operating limitations that applied to N98F.⁷⁰

10.1 Living History of Flight Exemptions

According to FAA Notice N8900.568 *Living History of Flight Experience Enhanced Oversight (LHFE)* dated November 3, 2020, LHFE exemptions are generally granted to authorize the carriage of persons for compensation in aircraft holding limited or experimental category airworthiness certificates. These historically significant, former military aircraft provide short in-flight experiences. They are operated under 14 *CFR* Part 91. A grant of exemption with its specific conditions and limitations (C/L) constitutes a regulatory requirement.

The FAA has historically found an overwhelming public interest in preserving United States (U.S.) aviation history, including former military aircraft transferred to private individuals or organizations for the purpose of restoring and flying these aircraft. The FAA has further determined that, with appropriate conditions and limitations imposed for public safety purposes, access to these aircraft can include allowing the public to experience flight. Because the regulations (14 *CFR*) do not otherwise allow such operations, the FAA established through its mid-1990s LHFE policy that exemptions are an appropriate way to preserve aviation history and keep historic airplanes operational when comparable airplanes manufactured under a standard airworthiness certificate do not exist.

The LHFE policy provided a way for the private owner/operators of historically significant, American-manufactured large, crew-served, piston-powered, multi-engine, World War II bomber aircraft to conduct limited passenger carrying flights, for compensation, as a way to generate funds needed to maintain and preserve these historically significant aircraft for future generations.⁷¹

The FAA set forth general policy considerations regarding LHFE operations on July 21, 2015.⁷² The Policy identifies certain aircraft the FAA generally considers eligible for an exemption under LHFE and specifies certain risk mitigation measures that apply to each LHFE operation. Regulatory relief extends only to those regulations specifically identified in each individual LHFE exemption.

According to FAA statistics, there are 21 LHFE exemption holders in the United States. Six of those exemption holders operate UH-1 helicopters similar to the accident helicopter.

⁷⁰ See Attachment 5 - N98F Airworthiness Records and Attachment 3 - FAA Interview Summaries.

⁷¹ Source: Docket No. FAA-2012-0374.

⁷² Refer to 80 FR 43012 (the Policy).

MARPAT Aviation, LLC did not have an LHFE exemption, nor did it apply for an exemption to operate N98F for compensation or hire with an experimental category airworthiness certificate.⁷³

G. ATTACHMENTS

Attachment 1 - Interviews
Attachment 2 - Witness Statements
Attachment 3 - FAA Interview Summaries
Attachment 4 - Pilot Information
Attachment 5 - N98F Airworthiness Records
Attachment 6 - N98F Registration Information
Attachment 7 - MARPAT Fueling Records
Attachment 8 - Army UH-1B Technical Manual Excerpts
Attachment 9 - Army UH-1B Pilot Checklist
Attachment 10 - Safety Pilot's UH-1B Checklist
Attachment 11 - MARPAT Website Information
Attachment 12 - MARPAT Program Letters (2014-2022)
Attachment 13 - FAA Legal Interpretations

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⁷³ See Attachment 3 - FAA Interview Summaries.