

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

HUMAN PERFORMANCE

GROUP CHAIRMAN'S FACTUAL REPORT

December 19, 2018

I. ACCIDENT

Operator: Papillon Airways
Aircraft: EC130 B4, N155GC
Location: Peach Springs, AZ
Date: February 10, 2018
Time: 1719 mountain standard time (MST)¹
NTSB #: WPR18MA087

II. PARTICIPANTS²

Human Performance Group
Chairman: Katherine Wilson
National Transportation Safety Board
Washington, DC

Operations Group
Chairman: Zoë Keliher
National Transportation Safety Board
Washington, DC

Member: Burl Boyd
Papillon Airways

Member: Manny Figlia
Airbus Helicopters

Member: Pat Hempen
Federal Aviation Administration
Washington, DC

¹ All times are reported in local time unless otherwise noted.

² Not all participants were present for all activities.

III. SUMMARY

On February 10, 2018, about 1719 mountain standard time (MST), an Airbus Helicopters EC130 B4 helicopter, N155GC, was destroyed when it impacted a canyon wash while on an approach to land at Quartermaster landing zone near Peach Springs, Arizona. The commercial pilot and one passenger sustained serious injuries and five passengers were fatally injured. The air-tour flight was operated by Papillon Airways, Inc. under the provisions of 14 *Code of Federal Regulations* Part 136. The helicopter departed Boulder City Municipal Airport, Boulder City, Nevada at 1642 MST and had intended to land at Quartermaster landing zone, a group of unimproved landing pads within Quartermaster canyon. Visual meteorological conditions prevailed, and a company flight plan had been filed.

IV. DETAILS OF THE INVESTIGATION

The Human Performance Investigator was assigned to the investigation on March 8, 2018, to support the ongoing investigation. Investigative activities included conducting interviews, gathering relevant documentation, observing flight operations and reviewing training materials. Information relevant to the pilot's pre-accident activities and health and company training and procedures are contained in this factual report.

1.0. History of flight

The pilot's duty day began at 1030. Prior to the first flight of the day, he reviewed and signed the morning briefing sheet and preflighted the helicopter. He was scheduled to fly two flights prior to the accident flight – a landing tour (to include a landing at Quartermaster) and an air tour (no landing at Quartermaster). The accident flight departed at 1642 and the pilot flew the Green 4 route to the Quartermaster canyon entrance. He believed he reported leaving the Green 4 route for a landing at Quartermaster Base as this was a standard call, then started his descent. As the flight approached Quartermaster Base, he observed multiple open landing spots which required an upriver, or “straight-in”, landing. Just prior to crossing the river, the pilot recalled some aircraft pointed upriver and others pointed downriver which indicated to him that the wind was not much of a factor. He recalled the Quartermaster wind sock wavering a little bit. The pilot recalled the flight being normal until the event and did not recall it being “extremely windy”.

As he was slowing and approaching the landing spot, he recalled getting hit by a violent gust of wind, that he described as similar to a microburst or low-level windshear that “took the aircraft from me.” Witnesses described the helicopter as crossing the river and then pitching up to about a 15-degree nose up attitude. The helicopter then crossed the bluff and while yawing left it transitioned to a nose level attitude then to a nose low attitude. Witnesses described the helicopter losing forward airspeed while continuing to yaw left for 360 degrees. The helicopter then descended in a flat pitch another 360 degrees before hitting the ridge line and rolling to the bottom of the canyon. Smoke could be seen rising from the canyon as witnesses ran to the accident site to assist.

2.0. Pilot information

The pilot information was documented through interviews³, FAA records, company records, and cellular telephone records.

The pilot, age 41, lived in Long Beach, California. He was hired by Papillon Airways on June 3, 2013, as a full-time pilot. According to Papillon, the pilot submitted a resignation letter on July 26, 2014, however, his position was changed to part time on August 28, 2014, which was his position at the time of the accident. He was qualified on the EC130 B4 and his most recent recurrent training and check ride was in December 2017, which included EC130 B4/T2 differences ground training. He had about 2423 hours total time, 1078 hours of which were in the EC130.

A review of employee records did not reveal any disciplinary actions against the pilot. The pilot's colleagues said he was a "seasoned pilot", other pilots would go to him for advice and he was "always in a good mood." Prior to the accident, he flew for Papillon January 20 and 21, 2018.

His most recent FAA 2nd class medical, dated November 13, 2017, had no limitations and no medications were listed. He rated his health as a 10 out of 10 and had no problems with his vision or hearing. He had no changes in his personal life, financial situation or health in the previous 12 months that would have impacted his performance.

2.1. Recent activities

The pilot did not recall his activities in the 72 hours before the accident but he was off duty from Papillon Airways. The pilot reported that he typically went to bed about 2200-2230 and woke up about 0700. In the morning he would typically eat breakfast and exercise then be ready to start his day by 0900. He did not recall any issues falling asleep or staying asleep in the days preceding the accident, nor did he take any prescription or non-prescription medications. He drank alcoholic beverages "on occasion" but did not recall the last time prior to the accident. He did not use tobacco products or illicit drugs.

On February 7, cellular telephone records indicated activity⁴ beginning at 0853 until 2230 with extended breaks in activity of greater than 60 minutes from 856 until 1103, 1259 until 1530, 1727 until 1841, 1841 until 2050, and 2050 until 2205.

On February 8, cellular telephone records indicated activity beginning at 0700 until 2246 with extended breaks in activity of greater than 60 minutes from 810 until 1210, 1210 until 1328, 1353 until 1503, 1614 until 1932, and 1932 until 2236.

On February 9, cellular telephone records indicated activity beginning at 1358 until 2240 with extended breaks in activity of greater than 60 minutes from 1350 until 1531, 1611 until 1848, and 1853 until 2316.

On February 10 (the day of the accident), cellular telephone records indicated activity from 1014 until 1020. The pilot's duty day started at 1130. The pilot said he would have left his house

³ See Attachment 1 – Interview Transcripts to this report.

⁴ Cellular telephone activity is considered outbound telephone calls or text messages, and inbound telephone calls in duration greater than 60 seconds.

about 1110 putting him at the airport about an hour before his first flight. He flew two flights prior to the accident flight. The first flight was a landing tour departing at 1228 and returning at 1409. The second flight was an air tour departing at 1453 and returning at 1555. He did not check the weather between his flights because he had just come from the canyon and there were short turns between flights. The accident flight departed at 1642.

3.0. Medical and pathological information

Toxicology tests performed by the FAA's Civil Aerospace Medical Institute on specimens from the pilot tested negative for a wide range of drugs, including major drugs of abuse. The results were positive for ketamine (and norketamine its major metabolite), an anesthetic used in the resuscitative efforts after the accident.

4.0. Papillon policies and safety programs

Papillon provided guidance and information to pilots on its policies and safety programs through its General Operations Manual (GOM) and Safety Management System (SMS) Manual.

4.1. Morning briefing

The Papillon GOM, Appendix E, Section I "Policies & procedures affecting all bases," Subsection "A. Administrative," stated in part (emphasis original):

Morning Briefing: The morning briefing is held daily at a base specific time (see Boulder City, Las Vegas or South Rim for details). Pilots who commence duty at other times shall brief themselves from the daily briefing sheet. In either case, the pilot is required to initial the briefing sheet next to their names each day.

The Papillon GOM, Appendix E, Section II "Base Specific Policies & Procedures," Section "A. Boulder City," Subsection "General" stated in part:

Morning Briefing: The Morning Safety Brief is held daily at 0545. Pilots' Showtimes will vary according to the scheduled departure time of the first flight but pilots need to afford themselves sufficient time to complete their pre-flight tasks either before or after the Morning Safety Brief accordingly. During the Daylight Savings Time period of the year when Boulder City aircraft conduct 6 Canyon Landing flights, there will be a 1245 Safety Briefing for all pilots with a 1230 Showtime.

If a pilots' Showtime precludes their attendance to a Safety Briefing, the pilot is to self-brief from the briefing sheet kept in the Pilot Briefing Room and confirm details of any changes with the Lead Pilot.

4.2. Pilot responsibilities and authority

The Papillon GOM, Section 2 “Company Personnel” listed the following duties, responsibilities and authority of the pilot in command:

PILOT IN COMMAND: The Pilot-in Command reports directly to the Chief Pilot. The Pilot-in-Command is directly responsible for, and is the final authority as to, the operation of the aircraft they command. Specific duties and responsibilities are as follows:

1. Maintaining thorough knowledge of all applicable FARs (to include NTSB 830) and this
1. Operations Manual and how they apply to specific operations being conducted.
2. Maintaining a thorough knowledge of the contents of the approved Rotorcraft Flight Manual for aircraft in which they are qualified.
3. Conducting a thorough and comprehensive pre-flight inspection of an assigned aircraft, documenting this inspection in the logbook with his/her signature and ensuring the following items are checked:
 - a. Mechanical and structural soundness.
 - b. Required emergency equipment is on board, current and functional.
 - c. All certificates and passenger briefing materials are on board.
 - d. Adequate fuel is on board.
 - e. Flight Manual, checklists, appropriate charts, company forms, and when required by FAR the Operations Manual are on board.
4. Ensuring that all required inspections have been complied with when an aircraft is returned to service.
5. Monitoring required inspections / maintenance actions during daily operations to ensure no item is over flown.
6. Conducting in-flight equipment checks (trend/power checks).
7. Conducting a thorough and comprehensive post flight inspection including the completion of aircraft logs and company paperwork in a neat and legible manner.
8. Complying with weight and balance procedures.
9. Complying with fueling procedures.
10. Complying with passenger briefing requirements.
11. Complying with the limitations and procedures outlined in the Rotorcraft Flight Manual, the General Operations Manual or other company policies and procedures.
12. Submitting (through Operations) required reports concerning deviations from regulations or accidents/incidents.
13. Supervising the loading, distribution, and movement of passengers and cargo about their assigned aircraft.
14. Supervising the fueling of the assigned aircraft.
15. Ensuring an appropriate flight plan has been filed for every flight.
16. Possessing on their person a current First or Second Class Medical Certificate and a valid Commercial or Airline Transport Pilot Certificate when engaged in flight activities.
17. Ensuring recency of experience as required by FAR.
18. Complying with the GCNP SFRA procedures.

19. Declining or discontinuing any mission or flight should the airworthiness of the aircraft, its performance capabilities, weather, pilot ability, physical or mental state or any other factor, (perform “IMSAFE” check) that may adversely impact safety come into question.
20. When operating away from home base on charters, exclusive use contract, or other missions, the Pilot-in-Command (PIC) may accept and conduct flight operations as long as each flight meets the Standard Operation Criteria outlined in the General Operations Manual. If Standard Operation Criteria cannot be met, the PIC must contact the DO or another A006 Manager in order to receive approval to initiate, conduct, or terminate the flight.
21. Maintains currency on work related subjects and company procedures by referring to the approved company website and the pilot reading file located in the pilot break room.
22. Complying with Flight Time Limitations and Rest Requirements as specified in FAR 135.365/267.

The Papillon GOM, Section 4 “Emergency Procedures” stated, in part (emphasis original):

AUTHORITY OF PILOT IN COMMAND

The Pilot-in-Command is the final authority concerning operation of their aircraft.

IN AN EMERGENCY REQUIRING IMMEDIATE ACTION, THE PILOT IN COMMAND MAY DEVIATE FROM ANY RULES AND/OR REGULATIONS TO THE EXTENT REQUIRED TO DEAL WITH THE EMERGENCY.

If this emergency authority is exercised, the Pilot-in-Command will comply with FAR Part 135.19(c) and the required report(s) will be sent through the Director of Operations or the Chief Pilot.

The Papillon GOM, Appendix E, Section I “Policies & procedures affecting all bases,” Subsection “B. General” stated the following (emphasis original):

Note: It is the intention of Management to put various procedures and safety nets in place to assist the pilots in managing the high workload that can be experienced while operating as professionals in a very busy tour company. During daily flight operations, Management will make decisions for the good of the fleet. This does not override the individual pilot’s decisions and comfort or skill level. If a pilot ever doubts elements related to a flight (i.e. weather, aircraft airworthiness, abilities, health of a passenger, etc.) it is the pilot’s responsibility to make a decision in accordance with Federal Regulations and good judgment. Pilots should seek guidance; however they shall not rely on others to make decisions for them.

4.3. Flight planning & weather information

The Papillon GOM, Appendix E, Section I “Policies & procedures affecting all bases,” Subsection “B. General” stated the following, in part (emphasis original):

Flight Planning & Weather Information: The current and forecasted weather, maximum temperature for the day, and any applicable NOTAMs or TFRs will be announced by the Chief Pilot or Lead Pilot during the morning briefing. This information will also be posted in the Pilot Lounge/Break room on the Daily Briefing sheet. The maximum temperature for the day as announced at the morning briefing and will be used for all company performance calculations. If the maximum forecasted temperature is exceeded, the PIC must complete a new performance calculation. If a pilot is absent from the morning briefing, the pilot will go to the Daily Briefing Sheet in the Pilot Lounge/Break room and familiarize themselves with the posted flight planning information. For flights conducted outside of the local tour area, the pilot will follow the procedures outlined in the GOM for obtaining weather and other pre-flight planning.

Last Minute Tour Route Changes: If a tour must be changed due to weather, curfew times, etc, the passengers will be briefed by a Customer Service Representative inside the terminal. Customers will be given the option of accepting the change, or rescheduling the flight for a different day. Once the passengers are loaded on the aircraft, the pilot will confirm that the passengers have been briefed and have agreed to the change. If the passengers have not been briefed by a Customer Service Representative, the pilot may brief them, or if the situation warrants send them back to the terminal to be briefed. If a tour is cut short due to weather or minor maintenance issue, the pilot will notify Tower as soon as possible and on return, escort the passengers to a Customer Service Representative to address any concerns. Pilots should never discuss price, or offer any kind of refund or reimbursement.

The Papillon GOM, Appendix E, Section I “Policies & procedures affecting all bases,” Subsection “D. Flight Operations” stated the following, in part (emphasis original):

Weather Deviation: The Grand Canyon National Park Special Flight Rules Area (GCNP SFRA) requires pilots to fly published routes and altitudes while operating within the SFRA. The pilot may only deviate from these published routes and altitudes in the interest of safety. If a flight cannot be completed due to adverse weather, the pilot will deviate from the assigned route/altitude or will perform a precautionary landing. (Reference the Precautionary Landings Section Below). Per the GCNP SFRA Manual, if the pilot deviates from a route or altitude, the pilot must then complete a Deviation Report and file that report electronically on the Flight and Duty Tracker Website. Papillon management will maintain this report or forward it to the FAA as appropriate. Pilots should evaluate the weather and make deviation decisions in a timely manner in order to avoid penetrating a Flight-Free Zone. The only acceptable reason for entry into a Flight-Free Zone will be for safety of flight.

4.4. Flight following

Papillon employed flight followers in the flight operations department. The Papillon GOM, Section 2 “Company Personnel” defined the duties, responsibilities, and authority of the flight follower as:

FLIGHT FOLLOWERS: Flight Followers are directly responsible to the Flight Line manager and in his or her absence reports to the person exercising operational control. Specific duties and responsibilities are as follows.

2. Flight follow with all aircraft departing and arriving at a Papillon Heliport.
3. Maintain radio communication with aircraft operating in local tour area.
4. Communicate with the Lead Pilot as to aircraft status or problems that arise throughout the day.
5. Communicate with the maintenance department as to aircraft maintenance needs.
6. Be trained and proficient in proper radio communication and be able to make clear and understandable radio transmissions.
7. Be trained and proficient in ALPRO program operations.
8. Be trained and proficient in ALPRO weight and balance program.
9. Ensure all aircraft are within weight and balance prior to releasing flight for manifesting.
10. Communicate with customer service reference any problems with customers.
11. Activate Emergency / Accident Response if needed.

4.4.1. Spidertracks

Papillon installed Spidertracks' satellite-based tracking systems on its helicopters, including the accident helicopter. According to the director of operations, Spidertracks was used as a "secondary flight following" and also to make sure that pilots were flying the routes they were supposed to be flying. Spidertracks provided information about an aircraft's position, altitude, speed and track. At the time of the accident, the system would transmit this information every 15 minutes; and transmit when the aircraft accelerated above or decelerated below 40 knots.

The Papillon GOM, Appendix E, Section I "Policies & procedures affecting all bases," Subsection "B. General" stated the following additional information (emphasis original):

Spidertracks: Spidertracks equipment has been incorporated as a safety feature in the majority of Papillon aircraft. According to the model of unit installed, the green maintenance or Mark button will be pressed once to notify management that you have a maintenance issue requiring you to land in the desert or in the Canyon. This will assist recovery personnel in locating the aircraft on the ground. The green and yellow buttons or red SOS button will be pressed once simultaneously in an emergency situation only to further aid in the recovery process. In the case of a minor mechanical malfunction that does not require a landing away from base, the pilot shall not use the Spidertracks system but will instead communicate the malfunction to the tower via FM radio.

4.5. Flight operations

The Papillon GOM, Appendix E, Section I "Policies & procedures affecting all bases," Subsection "D. Flight Operations" stated the following, in part (emphasis original):

Professionalism on the radio: Unnecessary radio chatter and congestion will not be tolerated. As a pilot operating in GCNP SFRA, vigilance and professionalism are essential to safety. For company matters, or anything concerning safety of flight, (i.e. PIREPS, or Maintenance issues) pilots will utilize the company FM radio.

Abnormal Maneuvers: Simulated emergency procedure training or any “abnormal maneuvers” are prohibited during passenger carrying operations. An abnormal maneuver means an intentional maneuver involving an abrupt change in an aircraft’s attitude, in either pitch or roll, or an abnormal acceleration not necessary for normal flight.

Altitudes / Tour Flying / Routes: No low-level, nap of the earth flights will be tolerated. We give **tours** not **rides**. No “showboating or aerobatic” type flying will be permitted. Fast or aggressive flying will be classified as “aerobatic” and a no tolerance policy is in place for these infractions. (Reference the TOPS Manual). Keep both hands on the controls when flying with passengers, especially when maneuvering into and out of the Canyon. In addition to TOPs requirements, during tour flights and while in descent, pilots are to use a maximum indicated airspeed of 120 knots and 2000’/minute rate of descent.

Sterile Cockpit procedures: As aircraft approach the Bat Towers while conducting the Canyon Landing tour and prior to descent, pilots are to brief their passengers that from that point onwards, the pilot is required to have a sterile cockpit and hence any tour narration will have to cease. Once the descent has commenced, pilots will maintain sterile cockpit to the landing at Quartermaster Point. On departure from Quartermaster landing sites following the ground period, the pilot will again brief his passengers that the next portion of the flight continues with sterile cockpit until exiting Quartermaster Canyon at the ‘Backside’. Only then can tour narration resume if workload permits.

The intent of this measure is to afford the pilot more opportunity to be aware of other traffic within the confines of the Grand Canyon, both by visual and audible means. Notwithstanding these instructions, pilots are reminded to maintain their situational awareness throughout the tour.

Go-Around: All pilots shall utilize a go-around whenever needed. This will be accomplished using radio calls appropriate to the base of operation.

Final Approach to Landing: All pilots will fly every approach in a controlled and methodical fashion. Approaches will be flown to termination in a stabilized hover and followed by a pause prior to any hover taxi.

4.6. Safety programs

The safety program and culture were described in post-accident interviews with Papillon personnel⁵. The director of operations described the culture as “very strong,” a “just culture” and that it “continues to improve.” The director of safety stated “Just culture means that if somebody does something that was not intentional, wasn't malicious, wasn't deliberate, and wasn't meant to

⁵ See Attachment 1 – Interview Transcripts to this report

be a problem, they can report that. It's just like an ASAP program.” Pilots felt that safety was a priority with management and they did not feel pressured to take or continue a flight that was not safe.

4.6.1. Safety management system

Papillon had a Safety Management System (SMS) which was outlined in their SMS Manual (Rev. 7 dated February 19, 2016). The objective of the manual was “to provide direction for all personnel in the safe operations of our organization.” The SMS was applicable to “all aspects of flight, maintenance, flight line and ramp, and facilities safety.”

The Papillon SMS Manual, Chapter 2 “Safety Policy” stated the following:

2/10.00 SAFETY POLICY

All levels of management is [sic] accountable for safety performance and is committed to providing safe, healthy, secure work conditions and attitudes with the objective of having an accident-free workplace.

Making safety excellence part of all activities strengthens Papillon. The Director of Safety is committed to:

- Ongoing pursuit of an accident-free workplace, including no harm to people, and no damage to equipment, the environment or property.
- A culture of open reporting of all safety hazards in which management will not initiate disciplinary action against any personnel who, in good faith, discloses a hazard or safety occurrence due to unintentional conduct.
- Regular and ongoing support for safety training and awareness programs.
- Regular audits of safety policies, procedures and practices.
- Monitoring industry activity to ensure best safety practices are incorporated in to Papillon.
- Providing and promoting the necessary resources to support this policy.
- Requiring all employees being responsible for maintaining a safe work environment through adherence to approved policies, procedures and training.
- Requiring all employees to familiarize themselves and comply with safety policies and procedures.

The Papillon SMS Manual, Chapter 3 “Safety Risk Management” discussed occurrence and hazard reporting, the purpose of which was “to identify those hazards which either currently exist or may pose potential hazards in the future.” Flight operations personnel were required to submit an Occurrence or Hazard Report immediately following “any occurrence or unsafe condition/hazard that they discover in the work place.” This report could be reported anonymously.

Papillon conducted daily safety meetings with pilots. The Papillon SMS Manual, Chapter 5 “Safety Promotion”, Section 5/20.00 “Communication & Awareness” stated, in part:

5/20.02 Safety Meetings

Daily Safety meetings and briefings will be conducted as part of the daily pilot briefings. A member from maintenance, flight line/tower, and customer service should be in attendance to the daily safety briefing. Items to be discussed can include, but not limited to:

- (a) New hazards that have been introduced or discovered in the work place;
- (b) Causes of any recent incidents or injuries and the methods adopted to prevent similar incidents in the future; and
- (c) Any safety issue deemed to deserve reinforcement.

The Papillon SMS Manual, Chapter 5 “Safety Promotion”, Section 5/20.00 “Communication & Awareness,” Subsection 5/20.04 “Safety as A Core Value” stated, in part:

Safety in Papillon Operations will be promoted as a “core value.” We expect you to embrace the following **Seven Guiding Safety Principles**:

- 1. Accept No Unnecessary Risk:
- 2. Make Risk Decisions at the Appropriate Level
- 3. Accept Risk When Benefits Outweigh the Costs
- 4. Don’t Become Complacent
- 5. Be Responsible:
- 6. Report Hazards:
- 7. Integrate ORM into Planning At All levels

4.6.2. TOPS

Papillon was certified by the Tour Operators Program of Safety (TOPS). The following information was provided on Papillon’s website⁶:

At Papillon Grand Canyon Helicopters, safety is our top priority. Papillon Airways, Inc. and its subsidiaries are fully certified by the Tour Operators Program of Safety (TOPS). TOPS (www.TOPSafety.org) is an organization whose main goal is to ensure safety and reliability throughout the air tour industry. Operators who carry a TOPS certification have agreed to operate their airlines to standards that far exceed those set forth by the FAA. These standards are upheld and enforced by regular internal audits and annual external audits by independent industrial safety auditors.

In addition to stringent operating standards, TOPS members provide a wealth of safety training to all employees involved in any portion of a visitor's flight. This includes additional safety training for management, flight crew, and ground support staff. The aircraft are also required to carry additional emergency communications equipment beyond

⁶ Accessed November 28, 2018, at <https://www.papillon.com/general-information/tour-operators-program-of-safety>

what is required by the FAA. For example, all Papillon aircraft are equipped with an advanced radio stack that connects the pilot to a dedicated company radio network. With this network, the aircraft is in contact with our highly trained flight following staff for the entire duration of the flight. Information about weather, additional aircraft, winds and more are relayed by the flight following center to other company aircraft flying in that area.

When flying with a TOPS-certified carrier guests can be assured that they are touring with some of the safest and most highly trained professionals in the industry.

Additional information on Papillon's policies, procedures and guidance can be found in Attachments 2 and 3 to this report.

5.0. Pilot training

Training for Papillon pilots was outlined in the Papillon Airways "Training Program". Training included six categories – initial new-hire training, initial equipment training, transition training, recurrent training, re-qualification training, and differences training. Each of these training categories included computer-based (via Avstar Training Systems), ground/classroom and/or flight training.

The Papillon Airways "Training Program", Section D "Curriculum Segments", included the following relevant segments – Basic Indoctrination, Aircraft Ground EC-130 Initial-B4/T2 Differences, SFAR 50-2 Ground, and Flight Training – PIC Helicopter EC-130. The following objectives and relevant topics for discussion are included in this section.

The objective of Basic Indoctrination training was "to introduce the new-hire pilot to the company and its manner of conducting operations in air transportation, to acquaint the pilot with the company's policies, procedures, forms, organizational and administrative practices, and to ensure the pilot has acquired basic airman knowledge." Topics for discussion included, among others – aircraft performance, meteorology, crew resource management, safety management system, and emergency situation training.

The objective of Aircraft Ground EC-130 Initial-B4/T2 Differences" training was "to develop the necessary pilot knowledge for understanding the basic functions of aircraft systems, the use of the individual systems components, the integration of aircraft systems, and operational procedures." Topics for discussion included, among others – adverse weather practices, communication and navigation equipment, performance characteristics during all flight regimes, and crew resource management/human factors.

The objective of SFAR 50-2⁷ Ground training was "to develop the necessary knowledge and understanding for a CFR Part 135 current and qualified pilot, to meet and clearly demonstrate the requirements and procedures set forth in SFAR 50-2." Topics for discussion included, among

⁷ Special Federal Aviation Regulation No. 50-2 - Special Flight Rules in the Vicinity of the Grand Canyon National Park, AZ

others – SFAR 50-2 general, aircraft operations – general, conduct of tours, and passenger briefings.

The objective of Flight Training – PIC Helicopter EC-130 training was “to develop the necessary pilot skills and knowledge to perform the duties and responsibilities of PIC and operate the aircraft to the desired standards.” Topics for discussion included, among others – preparation, descent, approaches, landings, other flight procedures during any airborne phase (including wind shear/microburst), and systems procedures training during any airborne phase (emergency) (including settling with power).

The objective of Qualification training was “to determine that a pilot has satisfactorily completed all required curriculum segments and to determine whether sufficient learning has occurred by the comparison of the pilot's performance, in practical situations, to established standards.” Qualification included a basic checking module (PIC competency check) and two additional checking modules (PIC line check and PIC route check). The basic checking module included the inflight maneuver “settling with power” and a notes section indicated it could be accomplished as “oral or actual.” The line check module included, among other topics, weather forecasts and information sources, flight planning, flight following procedures, inflight weather watch, and diversion procedures.

For additional information on Papillon's training curriculum, see Attachment 4 to this report.

5.1. Avstar Training System

Papillon pilots were provided computer-based training via the online Avstar Training System. Training modules included but were not limited to aviation weather, weather reporting, principals of flight for helicopters, and crew resource management. Pilots completed this training on an annual basis. The accident pilot last completed this training in November and December 2017.

5.2. Settling with power

According to the Papillon Airways Training Program, Section D “Curriculum Segments”, Curriculum Segment “Flight Training – PIC Helicopter EC-130”, settling with power was a training item included within “Systems procedures training during any airborne phase (emergency).” According to a Papillon lead pilot, settling with power had always been discussed in the classroom setting and several training cycles before the accident it was included in flight training. Pilots were trained to recognize the onset of settling with power and then to immediately recover. The Avstar Training System “Principals of flight for helicopters” module included a sub-module “Hazards of flight” which discussed settling with power. In addition, specifics of the trained maneuver are detailed in Section E “Flight Training Maneuvers”, page E-16, of the Training Program (see Attachment 4 to this report for additional information).

Katherine Wilson
Human Performance Investigator

Attachments

- 1.) Interview Transcripts
- 2.) Papillon Airways GOM Excerpts
- 3.) Papillon Airways SMS Manual Excerpts
- 4.) Papillon Airways Training Program Excerpts