NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

August 26, 2019

Group Chairman's Factual Report

OPERATIONAL FACTORS

ERA18MA099

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A. ACCIDENT

Location: New York, New York
Date: March 11, 2018
Time: 1908 eastern daylight time (2308Z)
Airplane: Airbus Helicopters AS-350-B2; N350LH

B. OPERATIONAL FACTORS GROUP

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C. SUMMARY

On March 11, 2018, about 1908 eastern daylight time (EDT),[1] an Airbus Helicopters AS-350 B2, registration N350LH, operated by Liberty Helicopters Inc., under the provisions of Title 14 *Code of Federal Regulations (CFR)* Part 91, was substantially damaged when it impacted the East River in New York, New York, and rolled inverted after the pilot reported a loss of engine power in flight, and subsequently entered an autorotation. The pilot sustained minor injuries and the five passengers were fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the scheduled 30-minute aerial photography flight which departed from the Helo Kearny Heliport (65NJ), Kearny, New Jersey.

D. DETAILS OF THE INVESTIGATION

NTSB members of the Operations Group arrived at New York, New York (NY) on March 12, 2018 to begin the field phase of the accident investigation. The Operations Group Chairman arrived after the conclusion of helicopter wreckage recovery activities on Monday night.

On March 13, 2018, the Operations Group was formed. The Operations Group proceeded to the NYPD Hangar at Floyd Bennett Field, where the accident helicopter was examined. The group took photos and documented the cockpit and cabin of the helicopter. The chief pilot for Liberty Helicopters was interviewed. The Operations Group traveled to the Liberty Helicopters facility in Kearny, New Jersey and the chief pilot escorted the group to the NYONair facility where NYONair representatives were briefed regarding NTSB investigation process and given the Party Agreement to review and sign.

On March 14, 2018, the Operations group returned the Liberty Helicopters facility in Kearny, NJ. The accident pilot was interviewed. The Operations Group then proceeded to the NYONair facility and the group reviewed the customer preflight safety briefing for FlyNYON flights and reviewed the passenger harness system. NYONair then transported group members to the Liberty Helicopters hanger, where a Liberty pilot explained the passenger loading procedure and demonstrated the technique used to hook up the harness and tether system and load FlyNYON doors-off passengers. The FAA records for Liberty Helicopters and NYONair were requested, and FAA certification and medical records were requested for the accident pilot.

On March 15, 2018, the Operations Group met at Liberty Helicopters headquarters where the NYONair party coordinator informed the Operations Group Chairman that NYONair party members would not be participating in any of the group activities for the day. The Liberty Helicopters passenger loader, the director of operations (DO), and safety officer were interviewed.

On March 16, 2018 the Operations group interviewed the NYONair chief of staff, New York City (NYC) lead pilot, chief pilot, chief executive officer and the director of business operations.

The Operations Group concluded the field phase of the investigation in New York, NY, at 1800 on March 18, 2018.

[1] All times will be in eastern daylight time (EDT) unless otherwise noted.

On March 28, 2018, the Operations Group returned to Kearney, New Jersey and interviewed five Liberty Helicopters pilots, including the training officer. On March 29, 2018 the Operations Group met in Saddle Brook, New Jersey and interviewed the FAA Principal Operating Inspector (POI) and Principal Maintenance Inspector (PMI) for Liberty Helicopters.

On April 24, 2018 and April 25, 2018, the Operations Group convened in Newark, New Jersey and interviewed the Liberty Helicopters chief pilot, the chief operating officer, and two Liberty Helicopters employees who had worked in the operations department. The NYONair director of business operations, and the FlyNYON customer experience manager were also interviewed.

The following telephone interviews were conducted by the Operations Group: former Liberty director of safety on April 10, 2018, former Liberty safety officer on April 16, 2018, the East-West FAA POI on April 17, 2018, the NYONair chief operating officer on June 5, 2018 and the former Liberty Helicopters chief executive officer on June 19, 2018.

E. FACTUAL INFORMATION

1.0 History of Flight

The accident occurred during an evening 30-minute FlyNYON doors-off aerial photography flight operated by Liberty Helicopters through an agreement with NYONair.[2] The passengers were secured in the helicopter using FAA-approved passenger restraints (seat belts) and a harness and tether system attached to the helicopter. Passengers seated in the two back middle seats were allowed to move to a seated position on the floor during the flight in order to take photographs.[3]

The passengers received a video safety briefing and were fitted for harnesses at the NYONair terminal, and the pilot received a text message from FlyNYON operations that the passengers were enroute to the helicopter by van about 1845, which was the scheduled departure time for the flight.[4] According to the accident pilot, when the five passengers arrived, the pilot briefed the passengers and then the pilot and loader secured them into the helicopter using the helicopter seat belts and the harness and tether system.[5] Four passengers were positioned on the back-bench seats of the cabin and one passenger was in the front left seat. The helicopter was positioned on spot 1 at the Helo Kearny Heliport (65NJ) and departed behind two other Liberty helicopters on FlyNYON flights that took off about the same time and headed southbound out of Kearny, New Jersey about 1850.[6]

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[2] For the purposes of this Factual Report, "NYONair" will refer to the organization, and "FlyNYON" will refer specifically to the doors-off "shoe-selfie" flights operated by both Liberty Helicopters and NYONair.

[3] See Survival Factors Group Chairman's Factual Report in the docket for information on the seat belts, harnesses, and tethers.

[4] See Attachment 10 - Weight and Balance Information. According to interviews, the van ride from the NYONair terminal to the helicopter was about 10 minutes.

[5] For additional information on how the passengers were secured in the helicopter see Survival Factors Group Chairman's Factual Report in the docket for this investigation.

[6] See Attachment 17 – Spidertracks Information. For additional information on flight following and Spidertracks data for the accident flight, see Section 8.1.3 Operational Control and Flight Following of this Factual Report.

The pilot stated that he traveled south after departure, climbing to an altitude of between 300 and 500 feet above ground level (agl) toward the Statue of Liberty. He flew around the Statue of Liberty such that both sides of the helicopter got views of the statue's face for the passengers to photograph. He then departed the statue and proceeded at 500 feet agl to the Brooklyn Bridge via the East River exclusion zone.[7]

At 1903 the pilot checked in with the LaGuardia Airport (LGA) Air Traffic Control (ATC) tower controller and reported that he was over Newtown Creek at 900 feet and requested a route up the East River to the north end of Central Park. The LGA tower controller assigned the flight a transponder code of 0205, and cleared the helicopter into the Class Bravo airspace at or below 2,000 feet mean sea level (msl).[8] ATC radar data showed the helicopter proceeding north along the East River climbing to 1,900 feet msl, and about 1906, the helicopter turned to the northwest flying towards the north end of Central Park and then started a 180º right hand descending turn over Manhattan back towards the East River. According to FAA records, at 1906:58 while heading east and descending through 800 feet, the pilot transmitted a mayday call stating, "east river, engine failure."

According to the accident pilot, the helicopter experienced an engine failure and he entered an autorotation descent to the East River. In a statement by the pilot after the accident he said that while over Manhattan facing westbound and passing through 25 knots he put in a right turn to begin to head southbound, the nose of the helicopter started to yaw right faster than the amount of pedal input he had commanded, and he heard a low rotor RPM alert. He saw engine and fuel pressure warning lights, lowered the collective to maintain rotor RPM and let the nose continue to come right. He entered an autorotation, continued towards the East River, and made a mayday radio transmission. He engaged the engine starter, but the engine did not relight. Once he was clear of the buildings, he stated that he activated the floats about 800 feet agl. He reached down to check the fuel flow control lever and noticed that the emergency fuel shutoff lever was up (OFF), and then shoved the fuel shutoff lever down (ON) and attempted a second start. He saw the engine temperature rise almost immediately; however, he was too close to the water and had to commit to the autorotative landing.

As the front skids contacted the river, water quickly covered the floor, and the helicopter continued a roll to the right, submerging the cockpit and cabin. Video captured by a witness showed the helicopter landing in the East River, and after contact with the water, the helicopter rolled to the right and submerged as the main rotor's rotation decelerated. The pilot reported that by the time he was able to unbuckle his seatbelt the helicopter was fully under water. The pilot was able to evacuate the helicopter. The five passengers did not evacuate and drowned.

[7] The New York Class B East River Exclusion area was a Special Flight Rules Area (SFRA) that required pilots to comply with the airspeed, aircraft, equipment and communications requirements outlined in 14 *CFR* 93.351.

[8] According to the FAA Pilot Handbook of Aeronautical Knowledge (FAA-H-8083-25B), Chapter 15 Airspace, Class B airspace is generally airspace from the surface to 10,000 feet mean sea level (msl) surrounding the nation's busiest airports in terms of operations or passenger enplanements. ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace.

2.0 Pilot Information

The pilot was 33 years old and resided in Danbury, CT. His date of hire with Liberty Helicopters was April 12, 2016. According to his aviation resume, prior to working for Liberty Helicopters, the pilot was employed at Northeast Helicopters in Ellington, CT, from 2013 to 2016, where he was the Assistant Chief pilot and company check pilot. He had no other aviation employment history. At the time of the accident, the pilot was also employed by Northeast Helicopters as a part-time flight instructor.

A review of the FAA Accident and Incident Data System (AIDS), Enforcement Information System (EIS) and PTRS[9] databases indicate no records or reports of any previous aviation incidents or accidents involving the pilot. A review of the National Crime Information Center (NCIC) and National Driver Record (NDR) databases indicated no criminal convictions, and no driver's license suspensions or revocations.

2.1 Pilot's Certification Record[10]

Private Pilot – Rotorcraft Helicopter certificate issued April 30, 2009.

Private Pilot – Rotorcraft Helicopter; Instrument Helicopter certificate issued April 7, 2011.

Commercial Pilot – Rotorcraft Helicopter; Instrument Helicopter (English Proficient) certificate issued September 14, 2011.

Flight Instructor Rotorcraft Helicopter original certificate issued February 28, 2012.

Flight Instructor Rotorcraft Helicopter; Instrument Helicopter certificate issued May 24, 2012.
Reissued May 6, 2016; May 13, 2016.

Ground Instructor - Advanced certificate issued May 6, 2014.

2.1.1 The Pilot's Certificates and Ratings Held at Time of the Accident

Commercial Pilot (certificate issued September 14, 2011)
Rotorcraft Helicopter; Instrument Helicopter

Flight Instructor Rotorcraft Helicopter (original certificate issued May 13, 2016)
Instrument Helicopter

Ground Instructor (certificate issued May 6, 2014)
Advanced

[9] 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 managers and inspectors with the current data on airmen, air agencies, air operators, and many other facets of the air transportation system. Source: FAA.
[10] Source: FAA

Medical Certificate – Second Class (issued July 27, 2017)
Limitations: none

2.2 The Pilot's Training and Proficiency Checks Completed[11]

Date of Hire	April 12, 2016
Date Upgraded to AS-350	April 12, 2016
Date of Most Recent Proficiency Training[12]	February 21, 2018
Date of Most Recent Proficiency Check (AS-350)[13]	February 21, 2018
Date of Most Recent PIC[14] Line Check (AS-350)[15]	February 21, 2018

2.3 The Pilot's Flight Times[16]

The Pilot's flight time in hours, according to Liberty Helicopters:

Total pilot flying time	3,100
Total PIC time	3,020
Total AS-350 flying time (PIC)[17]	1,430
Total flying time last 24 hours	2
Total flying time last 30 days	33
Total flying time last 90 days	57

2.4 The Pilot's Training

The Liberty Helicopters Flight Operations Manual,[18] Section 2.5, stated the following:

> *Initial, Transition, recurrent and difference training as specified in the training manual will be scheduled by the Chief Pilot.*
>
> *The Chief Pilot will schedule recurrent training and all check rides to insure [sp] compliance with the crewmembers base month.*

[11] Source: Liberty Helicopters.
[12] Title 14 *CFR* 135.293 required pilots to pass a written or oral test every 12 calendar months covering topics such as regulations, airplane systems, weight and balance, and weather, and a competency check covering maneuvers and procedures. The instrument proficiency check required by 14 *CFR* 135.297 may be substituted for the competency check required for the type of aircraft used in the check.
[13] Title 14 *CFR* 135.297(c) required each PIC to receive an instrument proficiency check each 6 calendar months.
[14] Pilot in Command.
[15] Title 14 *CFR* 135.299 required a PIC to pass a flight check in one of the types of aircraft which that pilot is to fly.
[16] Source: Liberty Helicopters.
[17] Pilot in command.
[18] The Liberty Helicopters FAA-accepted Flight Operations Manual (Revision 26, dated January 5, 2018) preface stated the following in part: "This manual has been prepared to guide flight operations and maintenance personnel in the discharge of their duties. It contains Company operating policies, procedures and regulations pertaining to all flight operations un the Liberty Helicopters, Inc."

Liberty Helicopters had an FAA-approved Part 135 Training Program which was outlined in the Liberty Helicopters, Inc., Training Program Manual (Revision 10, dated June 12, 2017). Initial new hire pilot-in-command training involved a ground curriculum and a flight curriculum. The ground curriculum had a basic introduction, airman specific, emergency situation training, general ground operations, aircraft systems, and aircraft systems integration segments. The flight curriculum had helicopter single engine (AS-350) initial and transition/difference segments. The training manual also contained qualification segments for VFR (visual flight rules) helicopter single engine, VFR helicopter multiengine, pilot-in-command line checks, instructor/check airmen, hazardous materials, record keeping, tour training, night flight, white-out/brown-out/flat light avoidance and recovery, hot refueling, and a maneuvers guide.

The accident pilot completed his initial new hire curriculum on March 11, 2016. He flew 11 training flights (10.1 flight hours) with the Liberty training captain. He flew his AS-350 check ride with the Liberty Helicopters chief pilot on April 12, 2016.

Title 14 *CFR* 135.351 required pilots to receive recurrent training to ensure the pilot was trained and proficient for the type aircraft and crewmember position involved, including emergency training. Title 14 *CFR* 135.331 required an operator's training program to provide emergency training for each crewmember, and stated the following in part:

> *(a) Each training program must provide emergency training under this section for each aircraft type, model, and configuration, each crewmember, and each kind of operation conducted, as appropriate for each crewmember and the certificate holder.*
>
> *(b) Emergency training must provide the following:*
>
> *(1) Instruction in emergency assignments and procedures, including coordination among crewmembers.*
>
> *(2) Individual instruction in the location, function, and operation of emergency equipment including -*
>
> *(i) Equipment used in ditching and evacuation;*
>
> *(ii) First aid equipment and its proper use; and*
>
> *(iii) Portable fire extinguishers, with emphasis on the type of extinguisher to be used on different classes of fires.*
>
> *(3) Instruction in the handling of emergency situations including -*
>
> *(i) Rapid decompression;*
>
> *(ii) Fire in flight or on the surface and smoke control procedures with emphasis on electrical equipment and related circuit breakers found in cabin areas;*
>
> *(iii) Ditching and evacuation;*
>
> *(iv) Illness, injury, or other abnormal situations involving passengers or crewmembers; and*

(v) Hijacking and other unusual situations.

4) Review of the certificate holder's previous aircraft accidents and incidents involving actual emergency situations.

(c) Each crewmember must perform at least the following emergency drills, using the proper emergency equipment and procedures, unless the Administrator finds that, for a particular drill, the crewmember can be adequately trained by demonstration:

(1) Ditching, if applicable.

(2) Emergency evacuation.

(3) Fire extinguishing and smoke control.

(4) Operation and use of emergency exits, including deployment and use of evacuation chutes, if applicable.

(5) Use of crew and passenger oxygen.

(6) Removal of life rafts from the aircraft, inflation of the life rafts, use of life lines, and boarding of passengers and crew, if applicable.

(7) Donning and inflation of life vests and the use of other individual flotation devices, if applicable.

Emergency training was outlined in the Liberty Helicopters, Inc. Training Manual (Emergency Operations). According to Liberty Helicopters records, the accident pilot received emergency training on the following dates:

AS-350 Part 135.351 Recurrent Check	January 3, 2017
AS 355 Part 135.351 Recurrent Check	May 31, 2017
AS-350 Part 135.351 Recurrent Check	February 21, 2018

A review of the Liberty Helicopters training records for the accident pilot did not reveal any deficiencies noted by the training captain, chief pilot, or other flight instructors. Training records showed that in-flight simulated engine failures (autorotations) were practiced between April 7, 2016 and April 11, 2016 during his initial new hire training.

According to the pilot's FAA Forms 8410-3 (Airman Competency/Proficiency Check – Part 135), he successfully passed AS-350 B2 Part 135.299 PIC flight checks on April 12, 2016, January 19, 2017 and February 21, 2018.[19] Single-engine autorotations were evaluated on each of these three check rides with satisfactory results.[20]

[19] The accident pilot also passed his 135.299 PIC check on the AS-355 F-1 FX on May 31, 2017. Autorotations were not evaluated on that check ride. See Attachment 4 – Pilot Training Information.
[20] Flight maneuvers on 135.299 check rides are graded with "satisfactory" or "unsatisfactory."

Ditching was not an element evaluated on FAA Form 8410-3. The Liberty training captain stated that ditching/water landings scenarios were discussed in training and that the water was considered an appropriate landing zone in the event of an emergency autorotation.[21]

2.5 Pilot Responsibilities and Duties

Title 14 *CFR* 91.3 stated the following:

> *(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.*
>
> *(c) Each pilot in command who deviates from a rule under paragraph (b) of this section shall, upon the request of the Administrator, send a written report of that deviation to the Administrator.*

The Liberty Helicopters Flight Operations Manual, Section 2.1 stated the following:

> *In addition to complying with Company and governmental regulations, a pilot is responsible for operating all aircraft in a safe, efficient and professional manner.*
>
> *All pilots are responsible to the Chief Pilot. The Chief Pilot is responsible to the Director of Operations.*
>
> *All pilots are responsible for insuring [sp] the overall safety of the passengers and in the interests of customer relations, to facilitate the passenger requests in a safe and confident manner.*
>
> *All pilots will arrive at their assigned aircraft at least thirty (30) minutes prior to scheduled departure to accomplish the necessary preflight functions.*

2.6 Pilot's Recent Activities[22]

The pilot's work schedule at Liberty was four-days-on, four-days-off. He told investigators that he normally began his workdays between 0930-0945 and that he normally awoke at 0600 on weekdays and 0700 on weekends. He estimated that his commute time from his residence to Liberty's hangar in Kearny, New Jersey was 1 hour and 15 minutes.

Thursday, March 8, 2018, was the beginning of the pilot's four-day workweek at Liberty Helicopters. Company duty logs indicated that he worked from 0700 to 1945. He told investigators that he went to bed about 2300.

[21] See Attachment 1 – Interview Summaries.
[22] See Attachment 5 - Pilot Duty Logs.

Company duty logs for Friday, March 9, 2018 indicated that the pilot worked from 0745 to 1900.

On Saturday, March 10, 2018, company duty logs indicated that the pilot worked from 0945 to 1815. The pilot told investigators that he woke at 0700 and went to bed about 2300.

The pilot reported that on Sunday, March 11, 2018, he woke about 0700. Company duty logs indicated that he went on duty at 0930. The pilot told investigators that he flew the accident helicopter all day. The helicopter's engine meter and maintenance records indicated that it was flown 1.8 hours.[23] Company records indicated that the pilot operated flights at 1100 and 1200. The pilot recalled eating lunch between 1400 and 1500. Company records indicated that the pilot operated two additional flights at 1500 and 1700. The accident flight was a half-hour sunset flight and the pilot's fifth photo flight of the day, having flown the same helicopter (N350LH) for all the flights that day.

The pilot recalled no disruptions to his sleep in the days before the accident. A Liberty Helicopters employee who helped the pilot board passengers on the day of the accident (including passengers on the accident flight) told investigators that the pilot seemed alert and was behaving normally.

3.0 Medical and Pathological Information

On his most recent FAA medical certificate application form, dated July 26, 2017, the pilot listed no significant medical conditions and indicated that he was not taking any medications. His 2nd class FAA medical certificate had no limitations.

The FAA's Civil Aerospace Medical Institute (CAMI) performed forensic toxicology on specimens obtained from the pilot. The specimens were tested for carbon monoxide (in blood), volatiles including ethanol (in urine), and various drugs (in urine), all of which yielded negative results.

[23] The helicopter's maintenance logbook showed that it had a modification for a collective-activated hour-meter. The clock started when the collective was increased for flight and it stopped when the collective was down (the helicopter was on the ground).

4.0 Helicopter Information

4.1 General

Photo 1: Photo of accident helicopter N350LH.[24]

The accident helicopter was an American Eurocopter Corp. AS-350 B2, registration N350LH, serial number 7654, and manufactured on July 13, 2013 in Columbus, Mississippi. It was a rotorcraft type aircraft with one (1) Safran Arriel-1D1 turbo-shaft engine (serial number 19549) and seven (7) seats, including the pilot seat. The aircraft was registered to Meridian Consulting Corp., Inc, 165 Western Road, Kearny, NJ, held a Standard Airworthiness certificate issued August 20, 2013, and was listed on the Operations Specifications (OpSpecs), paragraph D085, issued to Liberty Helicopters Inc. (FAA operating certificate MHIA082G).[25] The aircraft had 5,509.7 hours of total airframe time.[26]

The helicopter had one pilot seat (right side of the aircraft) and 6 passenger seats; a two-passenger bench seat (forward two-place seat) in the front of the cabin to the left of the pilot seat, and four passenger seats in the rear of the cabin.[27]

A review of FAA Air Transportation Oversight Records (ATOS) and the FAA AIDS database indicated no previous incidents or accidents for N350LH.

[24] Source: https://www.jetphotos.com/photo/8115764 .
[25] Source: FAA.
[26] Source: Liberty Helicopters, via NTSB Form 6120.
[27] See Survival Factors Group Chairman's factual report for details about the seats, restraints, harness/tether system, and cabin configuration.

4.2 Flight Operations with the Doors off

Doors-off operations were approved by the AS-350 B2 VEMD Flight Manual, and according to the AS-350 B2 VEMD Flight Manual, Section 2.3, the airspeed limitation when operating with four standard doors of the helicopter removed was a maximum airspeed of 110 knots.[28] For the accident flight, three doors were removed (the left and right front doors and the right main cabin door), and the left sliding main cabin door was latched open.

A Flight Manual Supplement for the AS-350 B2 equipped with a left hand sliding door was provided to the NTSB. The airspeed limitation when the helicopter is configured with both right doors removed, the left forward door removed, and the left sliding door locked open was 110 knots.

5.0 Weight and Balance Information

Title 14 *CFR* 91.103 Preflight Action stated in part that each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight.

Title 14 *CFR* Part 91.9 covers general operating and flight rules for all aircraft, and stated the following in part:

> *(a) Except as provided in paragraph (d) of this section, no person may operate a civil aircraft without complying with the operating limitations specified in the approved Airplane or Rotorcraft Flight Manual, markings, and placards, or as otherwise prescribed by the certificating authority of the country of registry.*

Liberty Helicopter's approved weight and balance program for its Part 135 operations was defined in OpSpecs A097, and was authorized to use actual or standard average passenger weights as outlined in Advisory Circular (AC) 120-27 (as revised). In addition, the Liberty Helicopters Flight Operations Manual, revision 10, section 3.16, stated that it was the Pilot-in-Command's responsibility for ensuring the weight and balance was in compliance with the approved Rotorcraft Operating Manual. The Liberty Helicopters Flight Operations Manual, Standard Operating Procedures, Section 3.16, stated the following in part:

> *The Pilot-in-Command is responsible for determining the maximum allowable takeoff weight and proper center of gravity prior to each flight. The approved aircraft Flight Manual or approved weight and balance procedures will be used as a guide for such computations. The PIC will load the aircraft so as not to place the aircraft out of weight and balance limits for the trip to be flown.*

The same section of the Liberty Helicopters Flight Operations Manual, page 3-20, stated the following in part:

> *It is understood that if these aircraft are loaded in a reasonable and logical way, with no compartment weight being exceeded, that the aircraft will be well within CG limits. The*

[28] Source: AS-350 B2 Flight Manual, Section 2.3.1 Airspeed Limitations.

PIC will insure [sp] that all passengers and/or cargo are distributed in such a manner as not to adversely impact standard loading Practices. . .

Sightseeing Aircraft will utilize declared or actual or the average Passenger Weights as described in Table 2-2 of AC 120—27E, when actual or declared weights are unavailable. Sightseeing Flights are "No Baggage Allowed" flights. . .

Supervision of aircraft loading is the responsibility of the PIC.

The investigation was not provided with documentation that a weight and balance was computed for the accident flight. The following table is an estimate of the weight and balance (in pounds) of the accident flight, based on available information.

WEIGHT & BALANCE (maximum certificated weights, shown in **bold**)	
Basic Empty Weight (BEW)[29]	3,186
Pilot weight	185
Passenger Weights[30]	943
Zero Fuel Weight	4,314
Doors removed, sliding door in place (estimate)[31]	-45
Fuel Weight (estimate 60 gallons)	408
Ramp Weight	4,677
Maximum Permissible Weight[32]	**4,961**
Taxi Fuel Burn (estimated)	-7
Takeoff Weight (estimated)	4,670
Estimated fuel burn	-52
Estimated Weight at Ditching (15 min flight time)	4,618

6.0 Meteorological Information

Newark International Airport (EWR)[33] recorded meteorological conditions on March 11, 2018, at 18:51 EST as wind from 320º at 7 knots, 10 statute miles visibility, few clouds at 5,000 feet, scattered clouds at 25,000 feet, temperature 6ºC and dew point -8ºC.

[29] According to the Rotorcraft Flying Handbook (FAA-H-8083-21), page 7-1, the basic empty weight was the weight of the standard helicopter, optional equipment, unusable fuel, and full operating fluids including full engine oil. Liberty Helicopters did not have a BEW weight for the doors removed configuration. For additional information, see Attachment 10 - Weight and Balance Information (Configuration C was used for weight and balance estimates of the accident aircraft).

[30] Passenger weights supplied by each passenger via their online FlyNYON booking information. See Attachment 10 – Weight and Balance Information.

[31] Source: Airbus via email to the Operations Group Chairman, dated October 22, 2018. According to the AS-350 B2 Flight Manual, removal of the doors had negligible effect on the helicopter's center of gravity.

[32] Source: Eurocopter AS-350 B2 Flight Manual, Section 2.1 Operating Limitations, and Liberty Helicopters Flight Operations Manual, Section 3.16 Weight and Balance, page 3-20.

[33] Newark International Airport was located about 4 miles from Helo Kearny Heliport (65NJ).

For additional weather information, see Meteorological Group Chairman's Factual Report in the docket for this investigation.

7.0 Airport Information[34]

The accident flight departed 65NJ, which was located at about 3 nautical miles to the southwest of Newark Liberty International Airport (EWR) at a latitude/longitude of 40-43-53.5000N / 074-06-59.9000W, and at an estimated field elevation of 11 feet.

The heliport was for private use only, and a base of operations for both Liberty Helicopters and NYONair operations.

8.0 Company Information

8.1 Liberty Helicopters

8.1.1 Company History

Liberty Helicopters, Inc. was owned by Sightseeing Tours of America (STA). According to New Jersey Superior Court records[35], STA was a company that promoted, marketed and operated sightseeing helicopter tours in the New York City area. Liberty's CEO and another individual founded STA in the 1990s and Liberty Helicopters became a subsidiary in 1996.

Liberty Helicopters was a Part 135 air carrier with an operating base located at the Kearny Heliport in South Kearny, New Jersey. It was founded in 1986 by the current director of operations. The FAA had authorized Liberty Helicopters to conduct rotorcraft on-demand passenger and cargo flights in Airbus AS-350B2 and AS-355F1 helicopters in both day and night VFR conditions. The company had seven AS-350B2 helicopters and one AS-355F1 helicopter listed in its FAA OpSpecs D085. According to Liberty Helicopter's director of operations, the company employed seven pilots. Liberty Helicopters operated charters from the Kearny Heliport and sightseeing flights from the Downtown Manhattan Heliport. The company also operated 14 *CFR* Part 91 FlyNYON aerial photography flights for NYONair out of the Kearny Heliport.

Liberty's chief operating officer (COO), who also served as the company's chief financial officer (CFO), stated that about 75% of Liberty's 2017 revenue was generated by sightseeing tours operated out of the Downtown Manhattan Heliport. In January 2016, the New York City Economic Development Corporation announced it would cut the number of sightseeing helicopter flights permitted to operate over New York City by 50% and ban Sunday sightseeing flights altogether, effective January 2017.[36] According to Liberty's CEO, this city-imposed reduction hurt Liberty's financial condition, and Liberty's chief pilot described the reduction as a "devastating blow." Liberty's CEO stated that the company tried to offset resulting financial losses by increasing the

[34] Source: http://www.airnav.com/airport/65NJ.
[35] Source: https://law.justia.com/cases/new-jersey/appellate-division-unpublished/2007/a3703-05-opn.html, downloaded April 4, 2018
[36] "Deal restricts tourist helicopter flights over New York" New York Times, January 31, 2016. Retrieved 11/28/2018 from https://www.nytimes.com/2016/02/01/nyregion/deal-restricts-tourist-helicopter-flights-over-new-york.html.

number of charter flights Liberty operated, but the company had to lay off about a third of its workforce.

According to Liberty's CEO and COO, the CEO of NYONair approached them in 2017 about having Liberty provide helicopters and pilots for NYONair's rapidly growing FlyNYON aerial photography flight business. The CEO agreed, and Liberty's COO developed a contract with NYONair's CFO. By September 2017, Liberty was operating FlyNYON aerial photography flights for NYONair out of its Kearny, NJ headquarters. According to Liberty's director of operations, these flights were not subject to the city-imposed reduction in sightseeing flights because they were classified as "aerial photography" flights and because they were not operated out of the Downtown Manhattan Heliport.

According to Liberty and NYONair personnel, some Liberty helicopter pilots had worked directly for NYONair operating FlyNYON doors-off flights in NYONair helicopters in the summer of 2017 before the contractual agreement between Liberty and NYONair was established. According to Liberty's former safety officer, Liberty's chief pilot was solidly opposed to Liberty operating any doors-off flights during that period, but in September 2017, the chief pilot's stated policy was reversed. The former safety officer stated that Liberty's chief pilot explained to him that his "hands were tied", the change was necessary because Liberty was not making enough money. According to the former safety officer, the chief pilot told him "Without FlyNYON we have nothing."

According to Liberty's former safety officer, the chief pilot had previously been able to push back against "crazy ideas" from upper management, including the director of charter marketing (who became the CEO of NYONair), but after the contractual agreement between Liberty and NYONair was signed, the relative authority of the two men seemed to flip, with the CEO of NYONair gaining the upper hand and the chief pilot's authority seeming diminished. The former Liberty safety officer said it was personally difficult for him to accept this change, and he believed the chief pilot was not happy about it either. However, the chief pilot organized meetings with the Liberty pilots thereafter where he told the pilots they had to operate the doors-off flights or look elsewhere for employment. When asked if he perceived NYONair's CEO having more influence on the operational control of the FlyNYON flight than Liberty, the Chief Pilot said no. When asked if he or his pilots felt like their jobs depended on complying with the NYONair CEO's requests, he said none of the pilots' jobs at Liberty were in jeopardy for not flying FlyNYON flights. When asked if he was aware of an email that was sent to the accident pilot by the NYONair CEO stating that Liberty pilots were not allowed to query about yellow or blue harnesses, he said yes, and he stated that he went to the Liberty DO to make sure that he was aware of it. When asked what the DO did, he said he did not know. The Liberty chief pilot stated that he also went a step further and spoke with the pilot and explained that the CEO of NYONair could not dictate whether a Liberty pilot could question something or not. He made sure that when that conversation finished that the accident PIC understood that he was the PIC and could question anything that he wanted to. When asked if he made that clear to all the Liberty pilots, he said absolutely, verbally to all their pilots individually.

When asked his personal opinion about Liberty's decision to take on the FlyNYON flights and if he was in favor of them, he said if it was his company they would not have been doing those flights since all of his flying had been with doors on, and he personally did not like flying with the doors

off. When asked if he personally felt like his "hands were tied" by doing the FlyNYON flights, he said that the company decided to do those flights, and the company paid him. If he personally did not think they were being conducted safely, he would have left the company, if because of his personal opinion he decided not to support it, then he was working for the wrong company. He said he did not remember ever using the term "my hands were tied" in terms of accepting FlyNYON flights, but those flights were flights he was directed to have his pilots fly. When asked why he did not personally like doors off flights, he said because he was afraid of heights, and all his flying had been doors on, and he liked to stick with what he knew and was comfortable with.

According to Liberty's chief pilot, Liberty rarely operated doors-off flights before 2017, and when they did the flight was typically a news-gathering or a movie production flight with passengers using normal seatbelts. He said he was not involved in the decision to begin performing doors-off flights for NYONair and he would not have made that decision if he owned Liberty, but it was the direction Liberty was going. The company had decided to do the flights, and the company paid him. Liberty's director of operations had informed him about the change and told him to begin preparing for the flights. He did not know who else was involved in the decision. He said some Liberty pilots supported the change and others were opposed.

On January 10, 2018, NYONair's CEO sent electronic messages to Liberty's director of training stating that Liberty was in poor financial condition. He messaged the director of training that Liberty's landlord at the Downtown Manhattan Heliport, Saker Aviation, had given Liberty a "30-day notice" to pay its lease and the NYONair CEO further described Liberty's finances as being "on a respirator." NYONair's CEO told the director of training that the "writing [was] on the wall" for Liberty. When investigators questioned the Liberty CEO about the NYONair CEO's claims, Liberty's CEO stated that the NYONair CEO's comments were "gossip" with "partial truth." He said Saker had given Liberty a 30-day notice to pay its receivables or face eviction, but Liberty had been given sufficient time to pay, and the dispute was amicably resolved. He said Saker had accelerated its payment schedule multiple times, putting Liberty under pressure. He stated that Saker had done the same to all the Downtown Manhattan Heliport operators, and he believed all had been paying late.

Liberty's CEO said the period November to April was always a struggle because business volume decreased and receivables extended, but his COO had always been able to successfully manage those cycles. Liberty's CEO stated that the winter of 2017-2018 was more difficult than usual, because of bad weather, increased maintenance, decreases in passengers and flight volume. The COO told investigators Liberty was in "typical first quarter condition" at the time of the accident. He expected the sightseeing business to pick up again around Easter, and said he had no doubts about the company's survival. Asked to characterize Liberty's financial condition between the time the company left TOPS (Tour Operators Program of Safety)[37] and the time of the accident, he said it was fine. They were restructuring departments.

Liberty's COO was asked if Liberty had begun operating NYONair flights because the company was in poor financial condition, and he said no. He said that NYONair was just another charter customer, and their flights generated only 7 or 8 percent of Liberty's 2017 revenue. He said the

[37] For additional information on TOPS, see Section 13.1.2 Tour Operators Program of Safety (TOPS) of this Factual Report.

flights had a thin profit margin that added only 5-15 percent to the company's bottom line. He said that before the accident he anticipated that the flights would generate a comparable fraction of Liberty's revenue in 2018. Liberty's DO said growth of the NYONair flights had been "explosive", and that they had flown "quite a few" of the flights. He said Liberty was operating 10-20 flights per day for NYONair by the time of the accident. Liberty's chief pilot described NYONair as Liberty's "biggest customer" at the time of the accident.

8.1.2 Organizational Structure

Liberty's CEO served as chairman of its board of directors, which included three other board members. In addition, Liberty's website listed the following managers:[38]

(1) Chief operating officer / chief financial officer
(2) Director of operations
(3) Chief pilot
(4) Vice president of charter and aircraft management
(5) Director of sightseeing marketing
(6) Director of sales
(7) Director of heliport operations
(8) Director of maintenance
(9) Human resources / payroll manager.

The web site listed NYONair's CEO as its director of sightseeing marketing for Liberty Helicopters. NYONair's CEO said he had been in charge of Liberty's charter department, but he had left that position in 2012 and transitioned to the role of consultant. Liberty's COO said NYONair's CEO officially left Liberty at the beginning of 2018 but remained in a consulting arrangement with Liberty's CEO for the purpose of developing new business opportunities for Liberty, perhaps in markets outside of New York City. An organizational chart, shown in Figure 1, was included in Liberty's Flight Operations Manual.

[38] Source: https://www.libertyhelicopter.com/25-1/42-management-a-team.html, downloaded April 4, 2018.

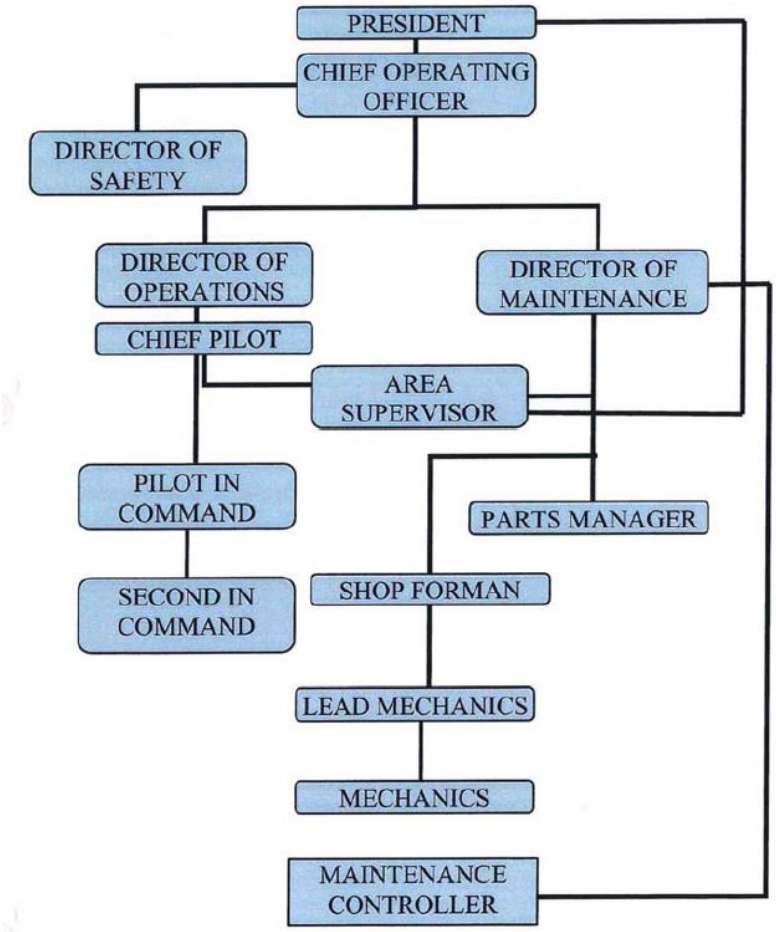

Figure 1: Liberty Helicopters Organizational Chart.[39]

The director of safety position, shown in Figure 1 as a position reporting directly to the COO, was vacant at the time of the accident. A position not shown on the chart titled "safety officer" was filled. The safety officer reported to the chief pilot rather than the COO.

8.1.3 Operational Control and Flight Following

According to federal regulations, operational control with respect to a flight means the exercise of authority over initiating, conducting, or terminating a flight (refer to 14 *CFR* Part 1). The certificate holder's operational control system should include all of the elements of operational control, such as crewmember and aircraft requirements, dispatch and operational control personnel requirements, management personnel, lease agreements, etc. Title 14 *CFR* 135.23 and 135.77 require a certificate holder to list the name and title of each individual authorized to exercise operational control in the certificate holder's operations manual. A certificate holder conducting part 135 operations may delegate the authority to exercise operational control of a specific flight

[39] Source: Liberty Helicopters Flight Operations Manual, Section 1.0. Liberty Helicopters also had a "Director of Training" not listed on their organizational chart. According to his interview with the NTSB, the Liberty Helicopters chief pilot and Liberty Helicopters director of training were also contract instructors and check airmen on the East West Helicopter LLC (NYONair) Part 135 certificate. See Attachment 1 – Interview Summaries.

to the PIC, but the overall responsibility for operational control always rests with the certificate holder. If a flight plan is not filed with air traffic control (ATC), the certificate holder must be able to establish the location of the flight to provide timely notification to an FAA facility or search and rescue facility if an aircraft is overdue or missing. The certificate holder's flight locating system must provide the certificate holder with the location, date, and estimated time for reestablishing communications if a flight will operate in an area where communications cannot be maintained. Parts 121 and 135 certificate holders must describe their system for exercising operational control in OpSpec A008. The FAA may allow certificate holders to list the name and section of the manual that contains the description of the operational control systems in A008 in lieu of describing the system itself in the OpSpec. In such cases, the FAA must ensure that the manual references listed in A008 remain current and that the sections of the manual referenced in A008 that describe the operational control system provide an accurate description of the system.[40]

Operational control for Liberty Helicopters was defined in the company OpSpecs A006 and A008. According to its director of operations, Liberty Helicopters had operational control of the accident flight. The Liberty Helicopters Flight Operations Manual provided a list of Liberty Helicopters employees who were authorized to exercise operational control, and included the director of operations, chief pilot, director of maintenance, flight coordinators, director of training and director of safety.[41]

The Liberty Helicopters Flight Operations Manual, Section 3.1, page 3-3 stated the following in part:

> *At no time can a revenue flight (FAA FAR part 135) be initiated without the determination and authority within the certificate holder's manuals, applicable regulations and operations specifications as outlined in this manual. The initiation of a flight (FAA FAR Part 91 or 135) must be deemed within the above mentioned guidelines by a management person or designed who is listed in op specs A006 or noted in this manual as a designated person.*

In addition, the Liberty Helicopters Flight Operations Manual, Section 3.1, page 3-7 stated the following in part:

> *Liberty Helicopters, Inc. will not operate any aircraft in Part 135 operations which is subject to an agreement between it and the aircraft owner or any lessee of the aircraft if that agreement shifts liability and accountability for the safety of Liberty's Part 135 flight operations from Liberty to the aircraft owner or other parties . . .Under this certificate Liberty Helicopters, Inc. is solely and ultimately responsible for the operational control of aircraft operations and the safety of each flight conducted under its certificate and operation specifications. This responsibility includes the actions and inactions of direct employees and agents employed under its certificate. Liberty's responsibility for operational control supersedes any contractor agreement, understanding or arrangement, either written or oral, expressed or implied, between any persons or entities with interest*

[40] Source: FAA Order 8900.1 (CHG 589), Volume 3, Chapter 25 "Operational Control for Air Carriers" (Section 1, paragraph 3-1926).
[41] Source: Liberty Helicopters Flight Operations Manual, Chapter 3.1, page 3-4.

of its operation. This responsibility cannot be transferred to any other person or entity. Therefore no direction from sources outside Liberty is allowed to influence or direct the operation in any manner.

The same section of the Liberty Helicopters Flight Operations Manual listed the following two notes:

Note:

1. *Any operational determinations that are made for Liberty Helicopters, Inc. for Part 135 flights, by the Director of Operations or his designee or made by the PIC assigned to that flight or series of flights are made in accordance with Liberty Helicopters, Inc's written policies, procedures and standards.*
2. *The Pilot in Command retains the final authority and must determine whether the initiation, conduction, termination, cancellation, diversion or delay of any flight or series of flights can be conducted safely and in accordance with operation specifications, manuals and all FARs.*

Title 14 *CFR* 135.79 requires a certificate holder conducting part 135 operations to establish procedures for locating each flight and retaining flight locating information at the certificate holder's principal place of business or at other places designated by the certificate holder.[42] According to interviews, flight following, aircraft and crew scheduling for Liberty Helicopter operations was performed by Liberty Helicopter flight followers located at the NYONair operations center, which was a single office space located on the ground floor of the "NYON Terminal" in Kearny, NJ. According to the NYONair flight operations manager, FlyNYON flights were scheduled by taking passenger information from the FlyNYON booking source and consolidating passengers onto specific flights, where the flights were then assigned to pilots and aircraft tail numbers. For Liberty Helicopter operating FlyNYON flights, NYONair would coordinate with Liberty Helicopters for pilot and aircraft availability.

Flight following of Liberty Helicopter flights was conducted using Spidertracks,[43] ADS-B[44] (via Passur network software integration) and direct radio communications with the pilots.

[42] Source: FAA Order 8900.1 (CHG 589), Volume 3, Chapter 25 "Operational Control for Air Carriers" (Section 1, paragraph 3-1926).

[43] The accident helicopter was equipped with Spidertracks, which provided near real-time flight tracking data transmitted at 6-minute intervals via Iridium satellites to an internet-based storage location. See Attachment 17 – Spidertracks Information.

[44] Automatic Dependent Surveillance – Broadcast. According to FAA Advisory Circular 20-154B, ADS-B is a next generation surveillance technology incorporating both air and ground aspects that provide air traffic control (ATC) with a more accurate picture of the aircraft's three-dimensional position in the enroute, terminal, approach, and surface environments. The aircraft provides the airborne portion in the form of a broadcast of its identification, position, altitude, velocity, and other information.

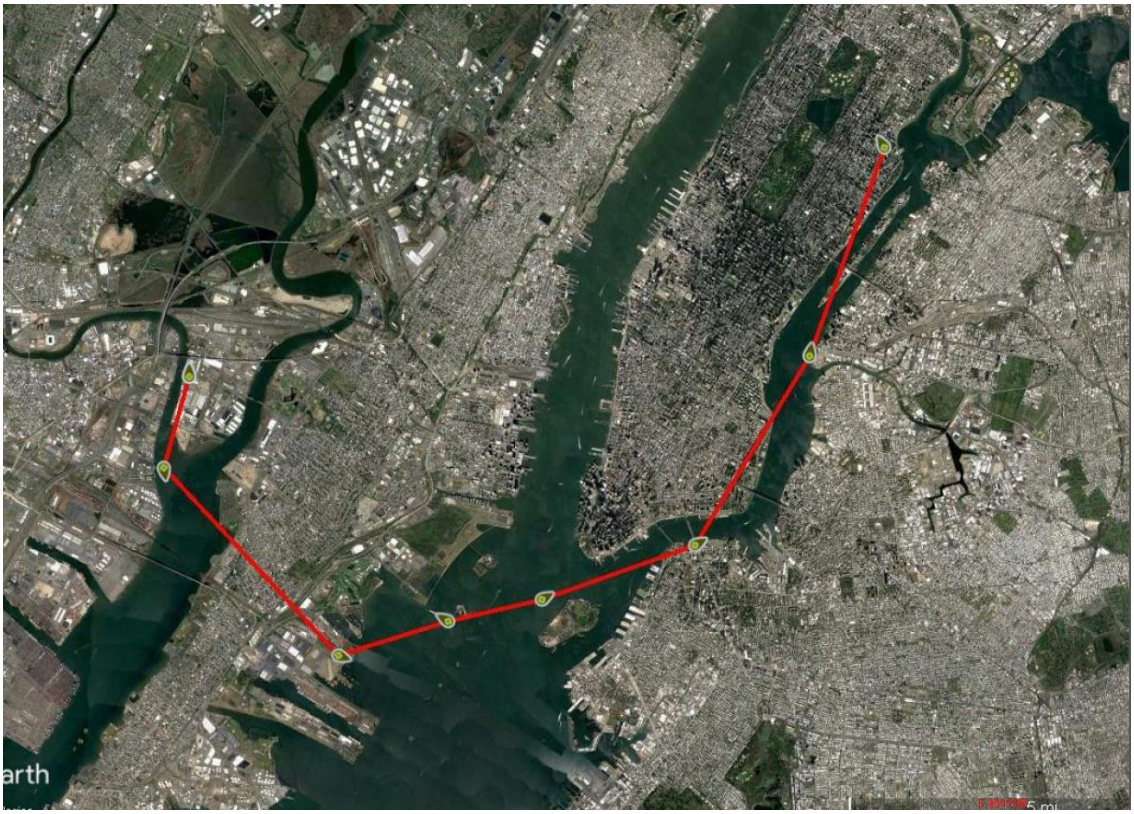

Figure 2: Spidertracks ground track for the accident flight on March 11, 2018.[45]

Liberty Helicopter flight followers also assisted pilots in analyzing weather, assigning aircraft and pilots to both Liberty and Liberty-operated FlyNYON flights, and communicating with pilots and maintenance. At the time of the accident, the NYONair operations center was staffed by one Liberty Helicopters flight follower.[46]

The Liberty Helicopters Flight Operations Manual, Standard Operating Procedures, Section 3.18 paragraph C (1), page 3-23, stated the following in part:

1. *All flights require a flight plan, either filed with the Liberty Operations or a Flight Service Station.*[47]

[45] See Attachment 17 – Spidertracks Information.

[46] According to a review of the 2016 TOPS Audit Form, the company that runs the Wall Street and 30th Street Heliport in lower Manhattan, Saker, also tracks all helicopters launched from the heliports for assigned altitude and routing. See Section 13.1.2 Tour Operators Program of Safety (TOPS) of this Factual Report.

[47] The section of the Liberty Flight Operations Manual did not specify a requirement for a flight plan only for Part 135 operations. According to the NTSB Form 6120 filed by Liberty Helicopters post-accident, for "Type Flight Plan Filed," the respondent checked "Company VFR." According to the Liberty Helicopters chief pilot, a flight plan was not filed for the accident flight, and selection of the "Company VFR" flight plan filed on the NTSB Form 6120 was "an operations function only, and the flight is followed by the ops person once the flight departs and the pilot makes his radio call that he is off. There is no paperwork associated with this." Source: Email sent to the NTSB Wednesday, October 3, 2018 8:42 AM.

2. *All flight plans filed with Liberty Operations will include a minimum of aircraft ID, departure point, fuel state, passengers on board and destination. This will be done just prior to takeoff or shortly thereafter as altitude permits radio transmission . . .*
3. *Flight plans will be closed when landing is assured or immediately upon landing by radio or phone if outside radio range.*
4. *Pilots should be aware that search procedures begin fifteen (15) minutes after ETA when filed with operations.*
5. *Pilots should provide the station holding the flight plan with a revised ETA whenever a delay is encountered or anticipated during a flight.*

8.1.4 Liberty Helicopters Safety Management

8.1.4.1 Safety Leadership and Staffing

When Liberty's CEO was asked which manager or executive at Liberty was principally responsible for managing safety, he said the "chain of command", including the COO, director of operations, chief pilot, and director of safety. He added that Liberty had appointed various directors of safety, and he incorrectly identified the director of training as Liberty's most recent director of safety. Liberty's former director of safety, who departed the company six months before the accident, stated that responsibility for managing safety rested with the COO. Liberty's COO said it rested with the director of maintenance and director of operations. The director of operations said that he and the chief pilot provided safety leadership for the pilots. The chief pilot agreed that safety was one of his responsibilities.

At the time of the accident, Liberty's COO had a profile on a business and employment-oriented web site on which he wrote that he had "led the charge to create a culture of safety [at Liberty], driving down overall cost of operations and engaging teams from front-to-back in organizational vision and mission."[48] When investigators asked him to expand on his leadership role in creating a culture of safety, he said that if concerns were brought to his attention his first question was "Is it safe?", and he stated that Liberty did not "sacrifice tomorrow for today." He also stated that if there was a question about the safety of doing something, they did not do it.

Liberty's COO told investigators he did not participate in pilot safety meetings or communicate with Liberty's safety officer about operational matters. He said Liberty's former director of safety had provided quarterly safety meeting summaries for him to review. When asked if he was aware of any concerns with passenger safety equipment provided by NYONair for use on flights operated by Liberty, he said no, and he had not personally inspected the equipment. Asked what safety programs were in place at the time of the accident, he said the maintenance department had training on tools, equipment, and maintenance. Flight operations had training on equipment, and a safety officer to oversee any issues. He added that if any additional programs were requested, the company made it happen.

[48] Source: https://www.linkedin.com/in/chrisvellioscpacgma/ Retrieved spring 2018 and also on December 12, 2018.

Liberty's safety staffing at the time of the accident was a line pilot who had been with the company less than a year and was appointed to the role of safety officer as a collateral duty in January 2018. He reported to the chief pilot. He told investigators that the safety officer position was not defined in Liberty's manuals, that he had no formal responsibilities, and that he received no additional training or compensation for his work in the safety role. He said he was not familiar with safety management systems (SMSs) and he did not think Liberty had an SMS. He stated that the safety officer position was a "holdover from TOPS" and that there had been a lot of requirements under TOPS, but there was a lot less to do since Liberty had left that program. He said he had been appointed to the safety officer position when a previous safety officer left in January 2018. He told investigators he had not convened any pilot safety meetings at Liberty.

Liberty's previous safety officer, who assumed that role in 2014 and departed the company in January 2018, was also a pilot who performed the role as a collateral duty. He told investigators he left Liberty because he disagreed with the company's decision to begin performing FlyNYON flights, and because he thought the authority of Liberty's chief pilot was being subverted by the CEO of NYONair. He was appointed to safety officer position by Liberty's former director of safety. The former director of safety, who assumed that role in 2013 and departed the company in September 2017, was also a line pilot. He told investigators that he had reported to the chief pilot in his role as a pilot, and to the COO in his role as director of safety. He stated that as director of safety, he organized quarterly safety meetings for pilots and heliport personnel, received hazard reports, and updated the company's safety manual. He stated that he left Liberty to accept a pilot job at a company located closer to his residence.

The former director of safety's position remained vacant from September 2017 until the time of the accident. Liberty's COO told investigators that the company planned to backfill the position, and that the decision about a replacement would be made by operational management. Asked when he would expect the position to be filled, he said within three months of the director's leaving. Asked why it had taken much longer to fill it, he said he was not aware of the extended delay.

8.1.4.2 **Passenger Alcohol Policy**

The Liberty Helicopters Flight Operations Manual, Section 3.5 Passenger Briefing, page 3-14, stated the following in part:

> *Note: No passenger that appears intoxicated will be allowed entry into the helicopter.*

Liberty's chief pilot and director of training stated that Liberty policy was that intoxicated passengers were not to be allowed to fly. Liberty pilots provided different responses to investigators regarding the existence of such a policy. Two of four pilots interviewed said they were unaware of such a policy.

The NYON SOP (Standard Operating Procedures) did not include guidance about passenger impairment or intoxication. NYONair's CEO said that if any passenger arrived intoxicated at the NYON terminal they would be dismissed from the facility. NYONair's director of business operations said that a customer experience representative (CX) could refuse to allow an obviously inebriated passenger to fly. The CX could bring it to him if needed and he would handle the situation delicately. However, if they observed a compliant but intoxicated passenger who was not totally functional but still wanted to fly, he said at the end of the day the pilot would have final say on the ramp. They would give the pilot a heads up and tell them if they did not feel comfortable with that passenger to let NYONair know. He said NYONair did not provide training to its personnel on how to deal with intoxicated passengers.

8.1.4.3 **Safety Policy and Procedures**

Liberty Helicopters had a Safety Manual dated February 28, 2017. Liberty's former director of safety told investigators he had been responsible for revising it. Revisions listed in the manual were dated June 7, 2016, July 8, 2015, and May 1, 2015. The Safety Manual's purpose was to "prescribe minimum standards for safety policies and procedures", to "broaden knowledge of safety principles and practices", to "provide fundamentals useful in the safety function," and to serve as a "guide for all company personnel in complying with the corporate policy for safety management and mishap prevention." The Safety Manual contained a safety policy statement asserting that ensuring the safety of Liberty Helicopters passengers and employees would take precedence over all other company goals.

Employee safety responsibilities included promptly reporting "any unsafe act or potentially unsafe act or condition to his or her immediate supervisor and the Company Safety Officer" Pilots were specifically directed to report hazards and unsafe conditions or acts to the proper authority, to promptly report accidents or incidents to their immediate supervisor, and to "maintain an attitude of constant alertness and absolute intolerance of potentially unsafe acts or conditions."

The Safety Manual specified the following company responsibilities:

1. *Integrate safety systems and procedures into all levels of operations and employees*
2. *Maintain a safe workplace*
3. *Provide safe working equipment*
4. *Comply with all government safety regulations and requirements*

The Safety Manual specified the following management and corporate responsibilities:

1. *Provide a safe workplace*
2. *Comply with corporate and governmental safety and health rules and regulations*
3. *Reduce accident costs*
4. *Motivate interest in safety through active personal involvement*
5. *Delegate specific safety assurance responsibilities to all levels of management where appropriate.*

6. *Maintain effective safety measurement and controls, to include reporting of inspections and effective emergency action plans*
7. *Prevent and correct all unsafe or potentially unsafe acts or conditions before a mishap occurs*
8. *Promote the safety program and motivate personnel to perform safely*
9. *Enforce safety program policies, procedures and directive through forceful continuous leadership*

The COO was tasked with implementing and establishing support for the safety program. With the assistance from the company safety officer, the COO was directed to "integrate safety systems into all areas of operations" through the following activities:

1. *Delegating specific aviation safety assurance and safety responsibilities, authority and accountability to the Company Safety Officer and applicable first-line supervisors who shall assure that each employee understands and is kept current with Liberty Helicopters safety policies and procedures*
2. *Promptly implementing approved recommendations resulting from incident reports, investigations and other safety improvement projects*
3. *Instructing supervisors and employees regarding their safety assurance responsibilities*
4. *Listing and submitting to central management the name and title of each person authorized to exercise operational control of the Company during the Company Chief Operating Officer's absence*

The Safety Manual specified the following director of operations responsibilities:

1. *Supervise, coordinate and direct flight operations without compromising safety under any circumstance*
2. *Assure all flights are conducted in a safe, professional manner*
3. *Assure that safe operating policies, procedures and directives are observed and enforced*
4. *Maintain, review and be familiar with safety, technical and operating data on all aircraft makes and models and support equipment operated by the company*
5. *Identify and correct the cause(s) of all unsafe or potentially unsafe acts or conditions before an incident or mishap occurs*
6. *Promote safety and motivate personnel to perform safely*
7. *Assure new employees do not assume operational duties until they have successfully completed all prescribed training and indoctrination*
8. *Plan and prepare for new work by placing emphasis on safety and the right selection of aircraft, crew and equipment for the job*
9. *Assure safety provisions are incorporated into the Operations Manual and all company standards, procedures, policies and directives*
10. *Assure and enforce employee compliance with Federal Aviation Regulations, Company Operations Manual, policies, procedures, standards and directives*
11. *Identify and correct any person with an improper regard for safety*

12. *Use measurement and control tools, such as reports and inspections, to enhance safety performance*
13. *Suspend any operation for safety reasons*
14. *Assuring written standard operations procedures for all aviation related activities are implemented and complies with, such as, Tour, 135 Charter and Maintenance*
15. *Assuring hiring, standardization and training programs are established for all employees involved with aviation activities*

The Safety Manual specified the following chief pilot responsibilities:

1. *Be responsible for the safety performance of the Company Flight Department*
2. *Assure all flights are accomplished safely in compliance with Federal Aviation Regulations, manufacturer procedures and directives, company policies, procedures, directive and prescribed safety practices and standards,*
3. *Assure all pilots comply with the safety program*
4. *Motivate and encourage satisfactory pilot safety performance*
5. *Assure all pilots maintain the necessary proficiency to perform flight duties safely*
6. *Ground any pilot for deficient flight or safety reason*
7. *Cancel any flight for safety reason*
8. *Identify, report and promptly correct unsafe or potentially unsafe acts or conditions, to include the cause(s) before an incident or mishap occurs*
9. *Perform training of pilot personnel in safety of flight matters*
10. *Assure pilot personnel are aware of and comply with technical directives affecting aircraft and flight safety*
11. *Developing a positive plan to assure job assignments are within each employee's current capabilities and qualifications prior to assuming the job.*

As previously discussed, the Liberty Helicopters Flight Operations Manual listed a position called "Director of Safety" that was not filled at the time of the accident. It was also not described in the Safety Manual. The Safety Manual described a position titled "company safety officer", and it specified that this person was responsible for maintaining the safety manual, developing the safety program, evaluating program results, and guiding its implementation through activities including the specification of requirements for internal safety reporting, investigating "mishaps and incidents", and performing safety-related inspections. According to the Safety Manual, the safety officer reported directly to the COO and was vested with the authority to prohibit the use of unsafe equipment and suspend unsafe operations in case of "immediate and unacceptable risk." The Safety Manual specified the following responsibilities of the safety officer:

1. *Provide and maintain the structure for the Liberty Helicopters Safety Program, including revision to the SAFETY MANUAL.*
2. *Serve as principal staff advisor, technical consultant and coordinator in planning, organizing, directing and evaluating all Safety Program elements in the company.*
3. *Provide for and assist in the establishment and implementation of plans, policies and procedures for safety programs of Liberty Helicopters*

4. *Interpret safety policies and procedures*
5. *Provide technical and professional assistance to eliminate or control unsafe behavior and environment*
6. *Assist company in developing safety aspects of training*
7. *Determine the need, then procure and distribute safety promotional and educational materials*
8. *Prepare progress reports of safety activities and other safety reports and safety studies*
9. *Develop recommendations for corrective measures where warranted by adverse hazardous conditions, procedures or other deficiencies*
10. *Ensure that safe practices and safe physical standards are incorporated in operating procedures, manuals and directives*
11. *Provide material and ensure high quality training for all safety personnel*
12. *Maintain close liaison with other Liberty Helicopters staff personnel on all relevant safety matters*
13. *Conduct safety surveys and inspections, as needed, of Liberty Helicopters to monitor safety program compliance and performance*
14. *Analyze mishaps and incidents and investigate to determine cause factors; recommend appropriate preventative measures*
15. *Arrange for safety reviews by outside experts, when appropriate*
16. *Stay current in FAA and other safety regulations*
17. *Stay current with technical matters as they apply to safety*
18. *Be available to assist in providing safety evaluations of new equipment, procedures or major projects*
19. *Conduct annual audits on frequently used fuel facilities to ensure compliance with NFPA standards*
20. *Determine management's interest toward safety through assessment by inspection of general housekeeping, machinery safeguarding, maintenance of aircraft and equipment, Safety Program procedures and compliance, provisions for worker comfort and training programs.*

The Safety Manual specified the following objectives for the company's safety program:

1. *Prevent personnel harm, injury or occupational illness*
2. *Prevent equipment or property loss or damage*
3. *Discover, record and report any new safety related procedures for evaluation and possible use with the Liberty Helicopters organization*
4. *Establish safety responsibilities and enforce safety management*
5. *Provide tools for safety management and control, such as checklists, inspection forms, reports, etc.*
6. *Provide a safe and healthful working environment for all employees*
7. *Evaluate safety aspects of new operations, equipment and personnel and assure that safety shall not be compromised under any circumstance.*

The Safety Manual outlined various safety measurement and control procedures, including quarterly safety meetings for pilots and heliport personnel. The minutes of each meeting was required to be reported to the COO within three days. Safety meetings had the following objectives:

1. *Review current safety matters and document those matters as part of the minutes of those meetings.*
2. *Motivate and maintain interest in safety.*
3. *Reevaluate and improve safety standards.*
4. *Display management's sincerity and commitment to safety.*
5. *Detect and reactivate unfinished safety business.*
6. *Analyze unsafe acts, conditions or situations and prescribe timely corrective actions.*
7. *Resolve areas of safety disagreements with responsible parties.*
8. *Solicit management and employee assistance in safety related matters.*
9. *Evaluate the safety of new employees, facilities and procedures.*
10. *Integrate safety into all aspects of the operation.*
11. *Evaluate management and employee safety performance.*
12. *Assign responsibilities for action items with target completion date.*
13. *Identify, analyze and correct the immediate and contributing causes listed in any Hazard Report or Incident Mishap Report, (see Cause Analysis Chart section 64), that cannot be resolved outside the committee.*

As previously stated, Liberty's former director of safety told investigators that he held these quarterly safety meetings from 2013 until his departure in August or September of 2017. Liberty stopped holding quarterly safety meeting after his departure.

The Safety Manual described procedures for safety measurement and control, goals of which were:

1. *Evaluate safety performance and compliance with prescribed regulations, policies, procedures and practices.*
2. *Identify unsafe acts, conditions and situations.*
3. *Determine causes and symptoms of unsafe acts, conditions and situations.*
4. *Fix accountability and responsibility for safety and quality.*
5. *Assure correction of unsafe performance or conditions.*

Methods for safety measurement and control included the conduct of inspections and the development of safety records and reports. Goals of safety inspections were:

1. *Prevent an incident or mishap prior to its occurrence by:*
    a. *Spotting unsafe conditions*
    b. *Noting and correcting unsafe behavior*
    c. *Measuring employee safety performance*
    d. *Assuring safe performance and safe equipment are assigned first priority*
2. *Check compliance with and evaluate the effectiveness of the Safety Program*
3. *Assist Management in:*

    a. *Improving safety standards*
    b. *Detecting, reviewing and reactivating unfinished business*
    c. *Teaching by example*
    d. *Reaching first hand [sp] agreements with responsible parties to implement and understand the purpose and value of safety techniques and practices.*
4. *Check new facilities*
5. *Reawaken and motivate interest in safety.*

The Safety Manual stated that the COO was responsible for selecting and scheduling inspections, with the advice of the safety officer and managers, but that any department manager could request a safety inspection "any time he or she believes an inspection is necessary to help assure the safety effectiveness of the operation for which the manager is responsible." Inspections could be performed by managers, line managers, or the "company safety officer."

A "company safety inspection" was one of several types of inspection described in the manual that could be performed by the company safety officer using an inspection form included in the manual. The manual stated that the company managers and safety officer would recommend areas to be inspected and the COO would approve the company inspection schedule and the overall scope of each inspection, to include:

1. *Safety Program compliance*
2. *Management safety performance and attitudes*
3. *Company safety statistics*
4. *Documentation and distribution of all safety related reports, inspections and materials.*
5. *Safety publications and communications*
6. *Employee safety performance and attitudes*
7. *Risk assessment procedures and timely corrective actions on safety discrepancies.*
8. *Safety training*
9. *Unfinished safety business*
10. *All flight and maintenance department areas*
11. *Areas of safety disagreement with responsible parties*
12. *Outlying base operations*
13. *Outside operations support, supply, etc.*

The results of company safety inspections were to be reported to the COO, company safety officer, and all department managers within two weeks, and responsibilities for each corrective action were to be assigned to specific personnel with target completion dates.

When investigators asked current and former Liberty personnel about Liberty safety programs and activities, none mentioned the conduct of company-wide safety inspections, aside from the safety audits Liberty underwent as a member of TOPS.

The Safety Manual described the purpose of and procedures for hazard reporting. With respect to the value of hazard reports, the manual stated:

> *Timely recognition, reporting and correction of hazards are essential elements in assuring safety. Hazard reports provide a method of communicating potential safety problems that may be encountered by any of our personnel so that they may be properly dealt with. If a hazard is not reported, someone may discover it in the hard way through an incident or accident. … Managers should realize that the hazard reports are a key part of our Safety Program and they should participate in decisions about identified hazards, since they will probably be responsible for corrective actions and their costs as well as being responsible should the hazard not be identified and corrected and result in an incident or mishap.*

The manual specified that company hazard reports would be emailed to the company safety officer via a computerized hazard report form that employees could fill out online. The manual outlined procedures for systematically analyzing and responding to employee hazard reports and specified that such reports should not be "used as a basis for disciplinary actions against any employee." The manual also stated:

> *Timely recognition, reporting and correction of hazards are essential elements in assuring safety. Hazard reports provide a method of communicating potential safety problems that may be encountered by any of our personnel so that they may be properly dealt with. If a hazard is not reported, someone may discover it in the hard way through an incident or accident. … Managers should realize that the hazard reports are a key part of our Safety Program and they should participate in decisions about identified hazards, since they will probably be responsible for corrective actions and their costs as well as being responsible should the hazard not be identified and corrected and result in an incident or mishap.*

Liberty's former safety officer said that Liberty maintained an anonymous online safety reporting form that pilots could fill out if they had any safety concerns, and that a copy of this form was automatically sent to the former director of safety. When the former safety officer was asked if these anonymous safety reports were reviewed at quarterly safety meetings, he said he could only recall one report being filed. Liberty's current safety officer also said Liberty had a hazard reporting system, but he said it was not being used. He told investigators Liberty ran safety issues through pilot meetings, which were held when necessary. Asked what type of event would make a Liberty pilot safety meeting necessary, he said they might hold one if a passenger walked toward a tail rotor, or a FlyNYON customer experience representative (CX) wandered around the helipad with a camera while a helicopter was taking off. He said safety meetings were for things that could be changed, whereas if a passenger did something stupid, they would not likely see them again.

Liberty Helicopters Flight Operations Manual Section 5.0 Safety, page 5-2 stated the following:

> *Liberty's safety structure is the entire organization with each employee contributing to the whole effect for a safe and efficient flight and ground operation.*
>
> *Primary emphasis of the Safety Program is directed toward the prevention of accidents rather than reacting after one has taken place. Accident prevention relies*

on the creation of the safety awareness and the vigorous resolution of all employees to identify hazards and problem areas before they result in accidents.

Once a quarter, the Safety Officer who is responsible for oversight of Flight Safety, will hold a safety meeting with all the pilots to discuss matters relating to safety of flight.

Liberty did not have a Flight Operational Quality Assurance (FOQA)[49] program or Aviation Safety Action Program (ASAP).[50]

8.1.4.4 **Liberty's Perceptions of Liberty Safety Culture**

Various Liberty personnel were asked to describe their perception of Liberty's and NYONair's organizational safety cultures. The responses of those that were asked are described below.

Liberty's CEO said that Liberty's safety culture was one of compliance. He also said that the company would address anything mechanical that could affect safety in any way. Liberty's COO said his perception was that Liberty had a top-notch safety culture and that the company was doing everything it could to go "above and beyond." Liberty's chief pilot said Liberty had a good safety culture. He stated that he was a big proponent of safety and he believed that Liberty's pilots understood that. When safety issues were brought to his attention, he would try his hardest rectify them. He said he believed a good safety culture started at the top and worked its way down, but he added that he was the face of the company for his pilots, and they did not see past him. For that reason, he believed that he drove the safety culture at Liberty. Liberty's safety officer said that when the pilots expressed safety concerns to Liberty management they were addressed. Liberty's former safety officer said the safety culture at Liberty was good and that everyone felt there was an open dialogue about safety matters. Liberty's former director of safety said Liberty had a good safety culture. He said the company had developed a good safety program and he only needed to make minor adjustments to it. He said Liberty's chief pilot was a big advocate for safety. Four current line pilots who were asked about Liberty's safety culture conveyed positive impressions.

8.1.4.5 **Liberty's Perceptions of NYONair Safety Culture**

[49] Flight Operational Quality Assurance. FOQA is an FAA-approved program for the routine collection and analysis of digital flight data gathered during aircraft operations, including data currently collected pursuant to existing regulatory provisions, when such data is included in an approved FOQA program. FOQA programs were designed to use in-flight recorded data collected by airlines to improve safety in the following areas: flight crew performance; training; air traffic procedures; airport maintenance and design; and aircraft operations and design. Operator participation in FOQA is voluntary.

[50] Aviation Safety Action Program. According to the FAA Advisory Circular 120-66B "Aviation Safety Action Program (ASAP)", the objective of the ASAP is to encourage air carrier and repair station employees to voluntarily report safety information that may be critical to identifying potential precursors to accidents. The Federal Aviation Administration (FAA) has determined that identifying these precursors is essential to further reducing the already low accident rate. Under an ASAP, safety issues are resolved through corrective action rather than through punishment or discipline. The ASAP provides for the collection, analysis, and retention of the safety data that is obtained. ASAP safety data, much of which would otherwise be unobtainable, is used to develop corrective actions for identified safety concerns, and to educate the appropriate parties to prevent a reoccurrence of the same type of safety event.

Liberty line pilots who were asked to describe NYONair's safety culture conveyed positive impressions. One Liberty pilot said that Liberty and NYONair's handling of safety issues and communication was always very good. He said concerns were raised in joint weekly meetings. In his opinion, those concerns were addressed quickly and adequately. A second Liberty pilot stated that both companies tried to make operations as safe as they could and were constantly trying to update and find better ways. A third Liberty pilot stated that NYONair was trying to be ahead of the curve and that he felt NYONair was doing a good job. A fourth Liberty pilot stated that he saw an effort by NYONair to improve safety and did not have any concerns "because they were trying to constantly improve the process and increase safety."

Liberty's CEO and COO said they had no impressions of NYONair's safety culture. Liberty's chief pilot said the safety culture at NYONair was "not anywhere near that of Liberty's," adding that it was a "a little bit all over the place with nothing really defined."[51] Liberty's safety officer said that when Liberty pilots expressed safety concerns to NYONair they were "shut down." He described his own personal efforts to improve passenger equipment and his perception that they were slow-walking their response to his recommendations. Liberty's former safety officer said that NYONair "meant well" and "they tried." They held weekly safety meetings, but there was a lot of negativity. The Liberty pilots did not want to do the flights, and they found it difficult to make changes related to the NYONair flights. He said the cold weather operations were difficult and the safety culture took a downturn in the winter. He thought Liberty pilots had the same complaints all the time and they never seemed to get resolved. In addition, he perceived animosity between the pilots and the NYONair customer experiences representatives.

Liberty's chief pilot told investigators that he had spoken with Liberty's director of operations about confrontational messages his son, the NYONair CEO, was sending to Liberty pilots and he told the director of operations that it had to stop. He could not recall when that had occurred, but it was every time the NYONair CEO would blast something out to the pilots in a text and he was made aware of it. He said it had happened two or three times. It would stop afterwards and then start up again on a separate issue. When asked if he had the authority to override the NYONair CEO, he said yes, the CEO never gave him any directions, and never communicated with him directly to give him any instructions. The CEO would text the pilots, bypassing him by going directly to the pilots.

Liberty's COO said he communicated with NYONair's CEO about twice a month. Asked whether he was aware that the NYONair CEO had been sending emails and texts to Liberty pilots on various issues, he said that, with one exception, he was not aware. He said he had been included on one text message that involved a customer service issue. Asked to elaborate, he said the message had not been specific, it had just mentioned customers. It was not anything re-occurring that would alarm him. Asked if he was aware of a 2018 email on which he was included and in which the NYONair's CEO reprimanded Liberty's director of training for questioning NYONair staff about the adequacy of FlyNYON harnesses, equipment, and personnel training, he said he was aware of that email, he had discussed it with Liberty's CEO, Liberty's CEO had discussed it with NYONair's CEO, and no further instances had occurred.

[51] See Attachment 1 – Interview Summaries.

Liberty's CEO said he also recalled this event. He remembered seeing that email and saying to NYONair's CEO something like "isn't that a little brash, a lot of lecturing" and told him that was not something should be doing to promote camaraderie and motivate people. The NYONair CEO told Liberty's CEO, "That was pretty much how I see it." Liberty's CEO recalled telling the NYONair CEO that if he wanted to take his business elsewhere, he could go ahead. Liberty's CEO told investigators it was not the culture of Liberty management to tolerate that.

8.2 NYONair

8.2.1 Company History

Kearny, New Jersey-based NYONair was formed in 2012 by its current CEO, and was originally called "New York on Air." In an interview, NYONair's CEO described FlyNYON as an "experience media brand." FlyNYON sold seats for the flights on its web site and booked passengers on its own flights and on flights operated by Liberty Helicopters. A signature characteristic of FlyNYON flights was that the flights were conducted with the helicopter doors open and passengers were secured to the aircraft and allowed to sit in the open doorways. Promotional materials showed passengers photographing urban areas from the open doors with cameras and smart phones. A type of photograph highlighted in FlyNYON promotional materials was the "shoe selfie," where passengers dangled their feet out the open doorway and photographed them with city landmarks in the background.

NYONair booked, briefed, and transported the passengers to the Kearny Heliport, and assisted them with boarding helicopters for the FlyNYON aerial photography flights. A signature characteristic of FlyNYON flights was that they were conducted with the helicopter doors open and passengers were secured to the aircraft. The two back middle seat passengers are allowed to move from their seats to a position on the floor of the aircraft by the open doorways for unobstructed views. Promotional materials showed passengers photographing urban areas from the open doors with smart phones. Promotional materials also featured "shoe selfie" photos where passengers extended their feet out of the open doorway and photographed them with city landmarks in the background.

NYONair's website stated that it was an "aviation services company that bridges the worlds of aviation, customer experience, and media." It listed NYONair services including "open door photo experience flights, aerial production services, transportation private charters, and branded media collaborations."[52] A manager listed on the Liberty Helicopters website as Liberty's vice president of charter and aircraft management also served as the CEO of NYONair.[53] NYONair provided investigators a one-year "charter customer agreement" between NYONair and Liberty that specified how NYONair would compensate Liberty Helicopters for FlyNYON flights. The agreement, dated November 1, 2017, stipulated that the two companies were independent contractors, not partners.[54]

[52] Source: https://www.nyonair.com/, downloaded April 4, 2018.
[53] The CEO of NYONair was also the son of Liberty's director of operations.
[54] See Attachment 8 - Liberty and NYONair Charter Customer Agreement.

The CEO of NYONair held a commercial helicopter pilot certificate. He told investigators he had approximately 6,000 hours of rotorcraft flight experience. He stated that he had worked as a commercial helicopter pilot in the 1990s and as a marketing manager for Liberty in the 2000s. He said he formed an aerial photography company called "Hangar 95" with a business partner in 2009 while working at Liberty Helicopters. Hangar 95 performed cinematography and aerial photography flights using a helicopter equipped with a gyro-stabilized camera system. He stated that he left Liberty in 2012 and formed New York On Air (later NYONair) with two other business partners, and that he subsequently formed the subsidiary FlyNYON in November 2014. The initial focus of FlyNYON was on promoting doors-off aerial photography flights on social media sites to build a following of potential customers.

NYONair operated two Airbus AS-355 helicopters, but the FlyNYON business grew rapidly, and the company soon needed additional aircraft to keep up with demand. In 2016 NYONair contracted with a Part 135 operator called Analar to provide one additional helicopter (an AS350FX) and one additional pilot.

In January 2017, NYONair purchased a Part 135 single pilot owner/operator certificate in Harrison, Ohio called East West Helicopter LLC and began working with the FAA's Cincinnati Flight Standards District Office (FSDO) to expand the certificate. This required NYONair to apply, qualify, and be granted FAA Part 135 authorization. It also required NYONair to develop and maintain manuals, training programs, and have the required management positions for Part 135 operations.[55] When NYONair became authorized to conduct Part 135 on-demand operations, the company began conducting limited charter flights under Part 135 while continuing its FlyNYON aerial photography activities under Part 91. NYONair planned to launch another subsidiary, an on-demand charter company called Foxtrot that would utilize the East West certificate in April 2018.

By July 2017, as NYONair was beginning to develop its Part 135 business, the volume of FlyNYON flights had increased to the point where NYONair's two helicopters plus the additional helicopter from Analar were no longer able to meet the demand, so the company developed a business arrangement with Liberty Helicopters to service their overflow. By November 2017, NYONair had finalized its contract with Liberty to have Liberty Helicopters carry passengers for NYONair. The contract between NYONair and Liberty Helicopters stipulated that the two companies were independent contractors, not partners, although Liberty Helicopters painted FlyNYON logos (in addition to Liberty and Blade logos) on the exterior of Liberty helicopters.[56] By the time of the accident, Liberty Helicopters aircraft were used to transport the majority of FlyNYON passengers out of Kearny, New Jersey.

In October 2017, NYONair opened a 10,000 square-foot operational, office and retail space in Kearny, New Jersey called the "NYON Terminal." The facility contained a helicopter fuselage for passenger familiarization, a virtual reality room to familiarize passengers with aerial vantage points, an operations center to monitor active flights and weather, a safety briefing room where passengers received preflight instructions, and a harness room where passengers could stow belongings and be fitted with harnesses. A NYONair press release described this facility as a

[55] For additional information, see Section 12.2 East West Helicopter LLC Oversight of this Factual Report.
[56] Blade was an app-based transportation service that specialized in crowd-sourcing helicopter charter flights.

"combination lounge/control center/interactive exhibit will disrupt the billion-dollar industry and pave the way for similar ventures in other key markets like Las Vegas, South Beach, San Francisco and Los Angeles." The CEO told investigators 11,000 to 12,000 passengers participated in the FlyNYON experience in the year before the accident, and about 80 percent of those passengers were flown in New York.

8.2.2 Organizational Structure

At the time of the accident, NYONair was hiring new pilots to facilitate its expansion after conducting a recruiting push at Helicopter Association International's Heli-Expo in February 2018. According to NYONair's chief of staff, NYONair employed about 40 full-time employees at the time of the accident, and about 40 additional employees in some other capacity. The company's website identified the following managerial and supervisory personnel:

1. Chief Executive Officer
2. Chief Operating Officer
3. Chief of Staff
4. Director of Operations
5. Vice president – Foxtrot
6. Assistant General Manager
7. Vice President – West coast
8. Chief pilot and Base Manager – Las Vegas
9. Base Manager – Miami
10. NYC Lead Pilot
11. Director of design and web development
12. Director of Sales
13. Social media manager
14. IT Director
15. Brand Ambassador

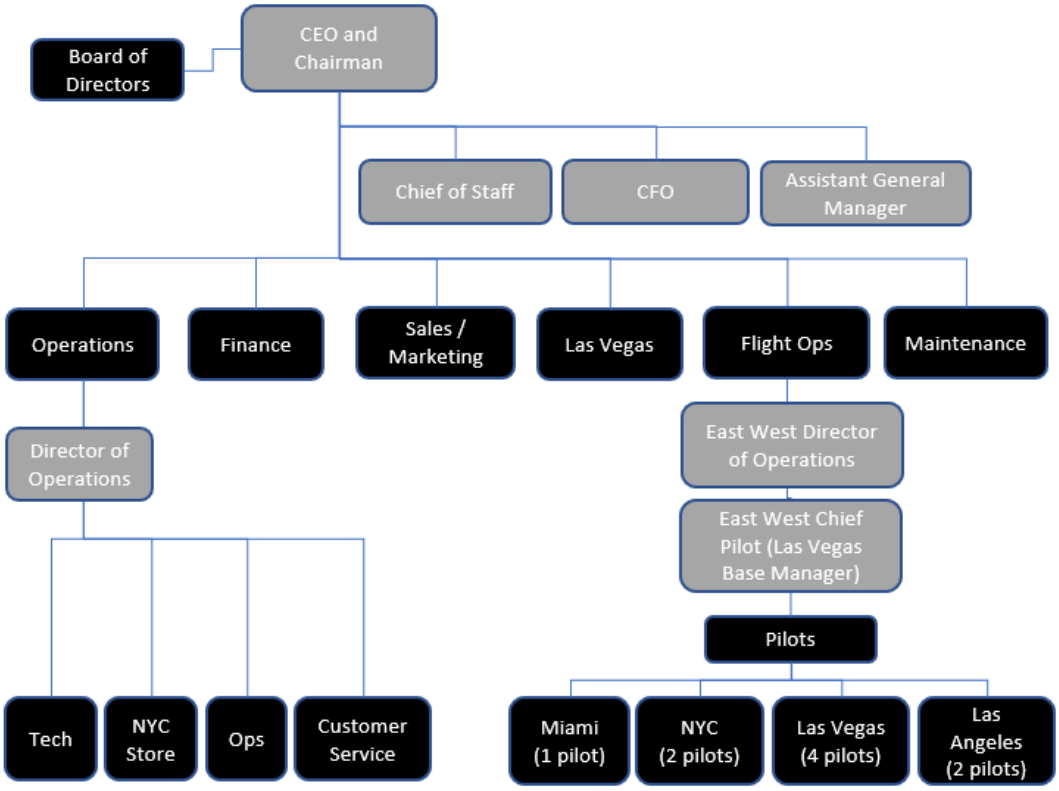

Figure 3: NYONair organizational chart (Departments shown in black, individual positions shown in gray).[57]

The East West Helicopter LLC (NYONair) Flight Operations Manual, General Operations, Section 2, showed the following company organization chart:

[57] Abbreviated NYONair organizational chart based on documents provided by NYONair.

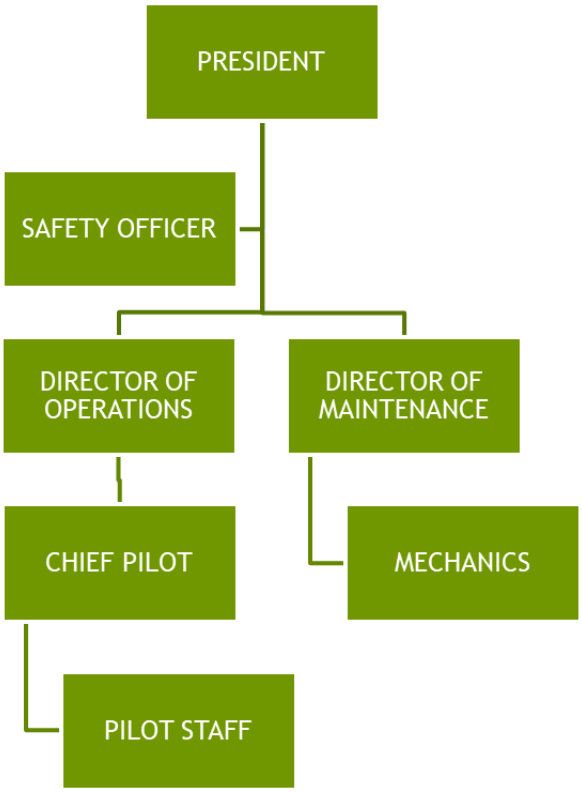

Figure 4: East West Helicopter LLC (NYONair) Organizational Chart.[58]

The East West (NYONair) Flight Operations Manual, General Operations, Section 2, showed the following company responsibilities of officers:

1. *President*

The President of the Company is responsible for:

a) *Conducting the business of the Company in accordance with the Corporate Charter;*
b) *Establishing the corporate staff to conduct the business of the Company;*
c) *Developing the flow of intelligence to see that the corporate purpose is being fulfilled and that all corporate and governmental rules and regulations are being complied with;*
d) *Profitable operation of the Company, the development of new business and the expansion of corporate activities;*
e) *Submission and control of operations, maintenance and marketing budgets and the subsequent budget performance of each of these departments;*
f) *A course of action that will benefit the Company and its' employees;*

[58] According to the NYONair CEO, the NYONair NYC lead pilot was the "safety officer." According to the NYONair NYC lead pilot, NYONair did not have a safety officer (see Attachment 1 – Interview Summaries). The NYONair organizational chart (Figure 3) did not list the position of "safety officer" in its structure.

g) *The President may delegate duties to other staff personnel, but retains the overall responsibility for the Air Carrier Operation.*

2. *Director of Operations*

The Director of Operations for the Company reports to the President. The Director of Operations is authorized to exercise operational control and to sign documents on behalf of the Certificate Holder. In addition, he/she is responsible for the following:

a) *Maintain a current file of applicable Federal Aviation Regulations, necessary to conduct flight operations in accordance with the authorized operating certificate.*
b) *Ensures the proper distribution of pertinent FAR's to departments concerned to insure a safe efficient operation, conducted in compliance with all laws, rules and applicable regulations;*
c) *Employment, direction, guidance and termination of other personnel as their positions apply to the scheduling and operations of all aircraft under the control of the Company to assure adherence to Company directives, policies and all regulations which govern control of the authorized operating certificate;*
d) *Acting as liaison with government or civil agencies responsible for contributing to, or effecting, the operation of Company aircraft;*
e) *Flight activities, scheduling aircraft, and flight following where necessary;*
f) *Maintain and post current and correct Master Records and Directives, as listed below:*
    (1) *Flight Crewmembers records*
    (2) *Records of all flights performed by the Company*
    (3) *Company Operations Manuals*
    (4) *Operations Specifications*
    (5) *Training Supervision – Flight & Ground Crewmembers*
    (6) *Company Directives and Policies*
    (7) *Aircraft Maintenance Coordination*
    (8) *Federal Aviation Regulation*
g) *Maintain trip records;*
h) *Receive and file load manifests;*
i) *Issue revisions to the Operations' Manuals, as necessary;*
j) *Initiate changes to the Training Manual, as necessary, and submit for acceptance by the FAA;*
k) *Other duties as assigned may be assigned by the President.*

The Director of Operations may delegate these functions but retains ultimate responsibility for the quality and completeness of their compliance.

3. *Chief Pilot*

The Chief Pilot for the Company reports to the Director of Operations and assists in coordinating and directing flight activities for the Company. He/she has full responsibility and authority for the following:

a) *Directs and supervises all flight crew members;*
b) *Recommends flight crewmembers of employment, flight assignment, or termination;*
c) *Insure [sp] flight personnel operate Company aircraft in a safe and efficient manner following standard operating procedures as described by the Flight Operations Manual consistent with all 14 CFR Parts;*
d) *Ensures flight crewmembers are appropriately trained and qualified for the applicable flight duty assignment;*
e) *Establishes flight and ground training programs appropriate for flight crewmembers;*
f) *Schedule, conduct, and/or supervise all flight and ground training; to include, reviewing flight crewmember training records twice annually;*
g) *Act as liaison, and/or coordinate with the FAA, as required;*
h) *Ensure flight crewmember records are current at all times;*
i) *Ensure, and maintain by direct oversight, high standards of competency and proficiency by each flight crewmember assigned to flight duty;*
j) *Establish Company pilot practices and procedures through the development of formal Standard Operating Procedures (SOP's) for the various mission types that may be required of Company aircraft;*
k) *Maintains all aircraft Operating Manuals in current status and proper condition;*
l) *Monitor and ensure all flight personnel are current for all required ground and flight training, have required flight checks completed, and have medical examinations completed, on time and in accordance with the applicable duty assignment assigned;*
m) *Coordinate with the Director of Maintenance to schedule training flights and/or maintenance operational check flight, and to keep a constant awareness of all aircraft status to assist with facilitating the most efficient scheduling of aircraft;*
n) *Coordinate with all other departments; as required, to effect maximum efficiency and economy in operation;*
o) *Other duties as assigned may be assigned.*

The Chief Pilot may delegate functions but retains ultimate responsibility for the quality and completeness of their compliance.

4. *<u>Pilot –In-Command</u> (PIC)*

The PIC shall be in command of the aircraft and responsible for the safety of all flight crewmember(s), passengers, and cargo aboard the aircraft for which he/she is assigned flight duty. He/she has full responsibility and authority for the following:

a) *Determines that all crewmembers are legally licensed, adequately rested and in proper dress code;*
b) *Plans flight assignment and obtains briefing information regarding purpose of the flight, weather, operating procedures and special instructions;*
c) *Supervises, or prepares, flight plans considering such factors as altitude, terrain, weather, range, weight, cruise control, data, facilities and navigational aids;*
d) *Ensures additional equipment is aboard, as required;*
e) *Ensures the aircraft is preflighted, inspected, fueled, loaded and equipped for the flight assignment;*
f) *Supervises loading and distribution of cargo and passengers and determines the aircraft weight and balance is within prescribed limits.*
    (1) *For multi-engine aircraft, ensures the required load manifest has been completed and that a copy of the manifest is left at home base, or is available at the point of departure. (The original load manifest is submitted with trip reports for inclusion into the thirty (30) day twin-engine aircraft weight and balance file.);*
g) *Ensures that all entrance doors, cargo and baggage doors are secure and that all seatbelts have been properly secured in the cabin prior to take off;*
h) *Ensures the proper preparation of flight logs, records and maintenance forms;*
i) *Maintains the Company Flight and Duty Time Record on a daily basis;*
j) *Ensures that all passengers have been properly briefed and they completely understand the briefing;*
k) *Advises the Company immediately, if any problems; however slight, have occurred during the assigned trip;*
l) *Must hold at least a Commercial Pilots Certificate with appropriate category and class ratings;*
m) *Must be highly knowledgeable of the Flight Operations Manual, FAR's, OP SPECS, Flight Manuals and other information specific to his/her assigned duties;*
n) *Reports for duty no less than 30 minutes prior to the scheduled departure and is discharged from duty 15 minutes after completion of the last assigned flight assignment.*
o) *Other duties as assigned may be assigned.*

8.2.3 NYONair Safety Management

8.2.3.1 Safety Leadership and Staffing

NYONair's CEO told investigators his company did not have a formal safety structure, but he had informally designated NYONair's NYC lead pilot and its chief pilot (who joined the company in January 2016 and June 2017, respectively) as the company's safety officers. NYONair's NYC lead pilot said she was not aware of any formal safety program at NYONair, and she said that she was not the right person to ask about such a program. She told investigators that NYONair did not have a safety officer, but she and the chief pilot were responsible for managing safety.

8.2.3.2 Pilot Meetings

NYONair's CEO told investigators that he started regular pilot meetings around the time the company began working with Liberty, because he saw a need for a mechanism to address any problems or communication breakdowns that might arise. He stated that he ran the first two or three meetings and then handed them off to the NYC lead pilot to run. NYONair's NYC lead pilot said that she was responsible for interfacing with the Liberty and FlyNYON pilots and holding a pilot meeting by telephone every other week. She told investigators the purpose of the meetings was to discuss matters involving operations, safety, training, and customer experience.

The NYC lead pilot said that she distributed minutes from the pilot meetings to all participants and to NYONair's CEO and chief pilot, and she told investigators that she updated the CEO and chief pilot on any follow-up actions. The NYC lead pilot further stated that she could call the NYONair CEO with any issues she had, and there was an open line of communications to him.

NYONair's CEO was asked if any safety issues were identified in these meetings. He said he would not call them issues, but they would get recommendations and there was always an array of opinions. Asked about any actions taken as a result of safety issues being raised, he said he was not directly involved in follow-up actions since the NYC lead pilot and chief pilot were in better positions to address these issues. The NYONair CEO explained that his tagline was if that was what they wanted and it improved the safety of the passengers, spend the money and get it. He was involved in making sure they had the necessary funds. He stated that the NYC lead pilot was his point person on safety matters, and if she wanted something, he would tell her to "Buy it. Get it."

Investigators requested copies of the minutes from the pilot meetings. NYONair provided minutes from 15 pilot meetings that occurred between August 9, 2017 and March 7, 2018, and Liberty's safety officer provided investigators with minutes from two additional meetings held on October 29, 2017 and January 11, 2018. These minutes addressed a range of topics including:

- Landing pad logistics
- Pilot-passenger interactions and customer service
- Passenger life vest use and inventory
- Passenger seatbelt use
- Flight following

- Aircraft configuration
- Airspace issues
- Aircraft fueling procedures
- Manifest, weight and balance procedures
- Passenger boarding procedures
- Reporting of safety issues
- Operational control
- Tethering of passengers and their belongings
- Transport of children
- Cold weather operations
- Passenger harness use and inventory
- Passenger safety briefings
- NYONair standard operating procedures and related training
- NYONair pilot hiring

8.2.3.2.1 Meeting Frequency and Participants

In a September 21, 2017, email, the NYC lead pilot wrote that NYONair would begin holding the pilot meetings on a weekly basis. Minutes indicated that the meetings were held weekly, with a few exceptions, between September 24, 2017, and November 26, 2017. Meetings were then held approximately biweekly from November 26, 2017 through March 7, 2018.

Initially, all Liberty and NYONair pilots and various other personnel were invited to participate, and according to the NYC lead pilot, they included up to 25 or 30 people. On January 21, 2018, NYONair's NYC lead pilot sent an email indicating that going forward, participation would be limited to herself, NYONair's chief pilot, Liberty's safety officer, and one representative from each of the following groups: NYONair management, NYONair operations/flight following, NYONair customer experience, and someone from each of four NYONair operating locations (New York, Miami, Las Vegas, and Los Angeles). The NYC lead pilot told investigators she did this at the request of NYONair's CEO, who told her the meetings had become an open forum and were being run inefficiently.

A March 7, 2018, pilot meeting resulted in conflict between the NYONair CEO and the Liberty safety officer. According to interviews with the Liberty safety officer, NYONair CEO, and others, the CEO referenced a desire to hire in-house pilots who were more "brand-friendly" to the NYON brand. After the meeting, the Liberty safety officer sent what the NYONair CEO told investigators was a "scathing" message referencing his comment. The NYONair CEO then informed Liberty's chief pilot that NYONair no longer required the Liberty safety officer's services, and NYONair deactivated a NYONair email account that was previously assigned to the Liberty safety officer since he would no longer be flying FlyNYON flights. Liberty's safety officer stated, and NYONair's CEO and Chief Pilot both stated that he was removed from the call because of a personal conflict and not because he raised a safety related issue.

8.2.3.2.2 Topics of Discussion

Passenger harnesses, tethering of passengers and their belongings, and cold weather operations were the topics listed most frequently in the pilot meeting minutes.

8.2.3.2.3 NYON SOPs

The minutes from the October 29, 2017 pilot meeting stated that "A Standard Operation Procedure (SOP) for NYON flights is currently in the works. This will help address training standards for both CX and pilots." The November 5, 2017 pilot meeting minutes stated, "New SOP - The NYON SOP is being distributed and pilots/ CX are being trained. Going forward, this is the standard and all pilots/ CX are expected to follow the SOP during each flight." The November 12, 2017 pilot meeting minutes stated, "SOP update - we are on Revision 6 of the SOP. There have been no negative comments or concerns from pilots/ CX/ ops. This is a living document and we will continue to include best practices as they arise." The November 19, 2017 pilot meeting minutes stated, "SOP updates - just a reminder that the SOP is a living document and is up for revision and input from anyone at any time. Best practices can always be improved upon."

The November 26, 2017 pilot meeting minutes stated, "There have been some issues with CX not understanding or adhering to the SOP. It boils down to the high turnover rate coupled with training. [CX manager] is going to set up additional training for the CX this week. Any issues please let me know. Just to reiterate, pilots and CX need to work together as a team and strive for a positive and supportive environment, especially in front of passengers. The December 13, 2017 minutes stated, "SOP update and feedback - SOP procedures have been going well for both CX and pilots. The only feedback I received was to make sure the CX are setting up aircraft correctly and according to the SOP each time."

The December 17, 2017 pilot meeting minutes stated, "[Liberty director of training], please update the SOP as follows: - The pilot will tether BOTH floor seat pax before they get up into their starting positions on the bench. This allows for proper tether length and aids in movement to the bench."

The February 21, 2017 pilot meeting minutes stated, "We will be have mandatory NYON training 1630 - 1830 in the hangar. [NYC lead pilot] will be leading the training." The March 7, 2017 minutes stated, "NYON Training – [NYC lead pilot] gave NYON-specific operations training in Vegas and distributed the SOP. Action item: each location needs to send me a slide with their specific site requirements."

For information on the content of NYON SOPs, see section 10.3 NYON SOPs of this Factual Report.

8.2.3.2.4 Passenger Harnesses

The first mention of passenger harnesses occurred in pilot meeting minutes dated October 1, 2017, which reported that new, FAA-approved passenger harnesses had been purchased. Minutes dated October 8, 2017, indicated that the new harnesses were still on the way. Minutes dated November 5, 2017, reported that Liberty's pilots and director of training had found that they could securely

fit the blue harnesses to many different sizes of people, and that NYONair would order 20 more, and that they would be phasing out the old style harnesses. Minutes dated November 26, 2017, reported that NYONair had received "a batch of new harnesses" and would be updating the passenger safety video to reflect their use. Minutes dated January 11, 2018, reported that the new style (blue) harnesses should take priority over yellow harnesses, that their use should be encouraged for smaller passengers (under 120 lbs) and that if blue harnesses were not being utilized, pilots could make queries about the harnesses.

The blue harnesses had available attachment points on the passenger's chest, upper back, and lower back. Liberty's director of training said that one reason the blue harnesses were preferred was because could reach their own carabiner at the attachment point on their lower back. Liberty's director of training told investigators that Liberty experienced delays receiving the new harnesses from NYONair. He said that "two or three" would show up at a time. NYONair told Liberty that it took a while to make the harnesses and they were coming. Liberty's director of training stated that "one month turned into four months" and when Liberty pilots asked about the new harnesses at a January 11, 2018, pilot meeting, NYONair's director of business operations told the Liberty pilots he would get back to them regarding the blue harnesses.

Liberty's director of training told investigators that after the January 11, 2018, pilot meeting, the NYC lead pilot spoke with the NYONair director of business operations about the status of the blue harness order, and she subsequently told the Liberty pilots that NYONair had decided to cancel the order for more blue harnesses because the yellow harnesses were legal and good enough, and there was no need to do anything extra. NYONair's director of business operations told investigators that NYONair's CEO and chief of staff made the purchasing decision, but it was his understanding that the order for new harnesses was never canceled.

In a January 17 email addressing the January 11, 2018, minutes, NYONair's CEO emailed the following statement to meeting participants:

> *Pilots: 1. Let me be clear, this isn't a safety issue with the harnesses, the pilot may* not *query about the harness. If they have an issue as with all issues that aren't safety related they can take it to their Chief pilot who can address it with me.*

The accident pilot emailed a response:

> *Just to be clear, as pilots we shouldn't ask about the blue harnesses, or we can't ask about the blue harnesses?*

The NYONair CEO replied on January 18, 2018:

> *[Accident pilot], the FAA requirement for doors off flights is passengers to only wear their seat belts. The doors off operators in Hawaii and Vegas only require seat belts for their passengers. NYON believes in going above and beyond as we continue to scale. The yellow harnesses are stunt/construction harnesses that are designed for human safety hanging off buildings at 1,000 feet plus. The blue harnesses are FAA approved but that isn't a*

requirement for a doors off flight. The yellow harnesses are just as legal/safe as the blue. Let me know if you need further understanding.

The NYONair NYC lead pilot replied:

The logic for using the blue harnesses first is that they are FAA approved, far superior to the yellow harnesses in terms of comfort and fit, and NYON invested in them so why not?

The NYONair CX manager responded:

While I agree with that logic, I don't agree with delaying pax on the ramp at sunset just because CX didn't bring out the blue harnesses. We've been using, tightening, and securing yellow harnesses on pax - big or small - for years. We have all equipment needed to tighten harnesses in the vans, as requested. Let's work together to get pax up on time. Rules can't be made on the ramp. Rules can't even be made in the weekly pilots' meeting. Rules can be proposed in the pilots' meeting but must be approved by [the NYONair CEO], at the end of the day.

The Liberty safety officer replied:

A rule wasn't made on the ramp, a judgement/safety call was. The flight wasn't delayed because the CX didn't bring out the blue harness the flight was delayed because the yellow harness couldn't be adjusted any further and it was falling off of her body.

The CX manager responded:

[Liberty safety officer], the call was made as they were walking to the helicopter. I was there. When I questioned the call, I was told it's because you had asked CX for blue harnesses earlier in the day and they weren't receptive. Next time tell me directly so I can make sure it happens.

The Liberty safety officer replied:

You weren't told that by me. I didn't delay the flight to make a point. I delayed the flight because harness was falling off of her body. If the concern is about getting the flight up on time then things like this shouldn't be making it out to the ramp. We are setting ourselves up for failure. Things departing aircraft is a much worse review then a delayed flight. A good enough attitude is not something we should have about this matter.

I spoke to Alex earlier that day after having the same issue and he told me the harnesses weren't being used because he wasn't trained. I told him if that was the case to let me know and I would harness the pax on the ramp and teach him. I then made a call to Ethan and asked that smaller passengers be put into the blue harnesses.

The CX manager responded:

How did we ever fly small women & children before blue harnesses?

The Liberty safety officer replied:

Zip ties.

The NYC lead pilot responded:

Everyone, let's just try to use the blue harnesses first when able. This is not a hard and fast rule. When it comes down to it, pilots have final call of what and who flies in the aircraft. If we work together this will be much more enjoyable, I promise.

The CX manager responded:

No problem with me. But can I get an answer as to what the gameplan is if all blue harnesses are being used and we have a small woman or child flying? I thought we replaced zip ties for locking carabiners..

The NYC lead pilot responded:

Since we get passenger manifests in advance, this shouldn't be too hard to plan for. If there are small people, they should get the blue harnesses over just blinding giving them out to random groups. Children especially should be in blue harnesses. Let me know if you have any issues.

A Liberty pilot responded:

Can I get a blue harness for when small people show up.

Liberty's chief pilot replied:

[Pilot's name] we will work on that. I'll get back to you.

In a February 18, 2018 group message to NYONair and Liberty personnel, Liberty's director of training wrote, "Today we did not have enough tethers, harnesses, carabiners, or headsets. At one point we had 6 helicopters trying to fly at once…. We need enough harnesses and equipment so we can have the 6 aircraft flying and the next 6 sets of paxs ready to fly. We cannot be waiting for aircraft to land so we can scavenge parts off landing passengers so we can get the next group ready." The director of training then outlined the number of passengers involved and requested that NYONair provide 60 passenger harnesses and 60 phone holders. He also requested a golf cart or similar vehicle to transport equipment between the hangar and the landing pad, and increased CX staffing in order to reduce delays and keep flights on schedule. He added:

Remember this is February!! We are in for a butt kicking come summertime when it will constantly be 4,5,6 or more aircraft running all day. We can get away a little bit with passengers taking off late when its slow and its the middle of the day but the moment the

volume kicked up at the end of the day it all fell apart. Almost no one got their sunset flights tonight and all the CX are trying their best to say sorry and we are trying to get you up as soon as possible. Hopefully we didn't have to refund any of the passengers when they got back.

Plus what we are selling is the NYON experience, not the herding cattle through the door you get with a typical tour operation. When we don't the gear and personnel to get the job done passengers suffer. Today after landing it was ok everyone lets go and they are rushed away back to the van with no time to take more pictures or discuss how their flight went because we need to steal their harnesses and phone holders. Or they are being rushed to get back in the van so it can bring down the next set of passengers because we only have 1 van and the CX on the ramp need to come back to KP to harness the next group because no one is there.

The CEO replied in another group message with the following statement:

I'm insulted by the manner at which you address my team. My team worked and works their [profanity] off today and every day. It's the month of February when all other operators in NY had most of their fleet parked today with zero flights. Instead of saying thank you point out the bad and act as if we didn't think of these solutions.

NYON is Liberty's biggest customer (and growing) and you talk to us as if we are a bunch of [profanity]. Like we don't know or havnt [sp] thought out for hours what we are doing. Let me tell you [two other helicopter operators] have both called me with in the last week to ask if they can provide Helicopters for our product. Your tone and the nature at which you speak to us makes me want to move 100% of all our business tomorrow to those companies. You Liberty Ops sit back (I have birdies that give me the good the bad and the ugly) and call it a shit show instead of being part of the solution. That same opinion somehow makes it out fo [sp] the nest and into other markets but it always gets back to me. You all have laughed at our efforts over the past few years poking fun at our expense.

You treated my partner and client from LA [partner's name] who by the way was paying for his training (Liberty revenue) like some [profanity] that was somehow below you because he needed some extra basic training...[NYONair chief pilot] got him checked out in 30 minutes. [partner's name] has been conducting safe flights ever since 2 months and running.

I appreciate your advice but I'll have you know there is a tremendous amount of effort that goes into to our communication with all our passengers before each and every trip. Managers, employees have spent many hours in many meetings going over every possibility. Yet you talk to us like we just sit on our hands and wait for the passengers to show up. Like we haven't done our homework.

[Liberty director of training] our industry is loaded with a lot of dinosaurs, those same dinosaurs said NYON would never be able to drive customers out of NYC only to fly out of NJ. NYON did, and those same dinosaurs said shoe selfies were moronic and yet we grew

by 400% last year when operators in Vegas shrunk by 28% and operators in NY shrunk below the 50% line the government cut them. Those same dinosaurs have been telling me I can't, it will never happen, your a lost cause, you don't know what your doing, no doors in NYC...that's a joke, social media that's a joke and many more statements like those I've listened too over the past 5 years.

So when you...yes you and the rest sit back and make your condescending comments I cringe at the sound of it. This ain't a hot load like you do I the city. We shut down between each flight yet everything is challenge...we look at the bad and not the opportunity. Amazing... [Liberty director of training] you are a pilot, fly the Helicopter safety.

NYONair's CX manager told investigators that at the time of the accident, NYONair had 30 to 40 of the older yellow harnesses and 15 blue harnesses, but he said they were only using five of the blue harnesses because they did not have cutters for the other ten.

8.2.3.2.5 Passenger Tethers and Cutters

In a February 8, 2018 email Liberty's safety officer told Liberty's chief pilot that he was researching new cutters and tethers for FlyNYON passengers. The NYONair NYC lead pilot said she was surprised about the problem with the existing cutter and tether, and as soon as the Liberty safety pilot brought the problem to her attention, she added it to the agenda for a pilot meeting. In pilot meeting minutes dated February 21, 2018, the NYC lead pilot wrote that the Liberty safety officer was "researching and procuring" new cutters and tethers that "we will be testing shortly." In a February 24, 2018 email, Liberty's safety officer sent NYONair's director of business operations links to purchase the new equipment that were embedded as hyperlinks in his email. The director of business operations replied, asking, "Just to confirm.. [the NYC lead pilot] was unable to cut through the old tethers with the green knife." The Liberty safety officer replied, "She was able to but not easily. The new knife and new tether cut very easy. You can call [her] to get her thoughts on it also." On February 25, 2018, the NYONair chief of staff emailed the Liberty safety pilot asking him to send links for purchasing the new equipment.

The proposed equipment was discussed again at a pilot meeting on March 7, 2018, that was attended by the NYONair CEO. When the Liberty safety pilot was asked whether anyone at FlyNYON had indicated to him whether they planned to follow through on purchasing the new equipment, he said, "Not with me." Asked what they said when he brought it up in the meetings, he said "Nothing really." He said that in those meetings everyone was talking over each other because it was a conference call, "So it was like okay good. What's the next subject. Let's talk about that." In the minutes from the March 7, 2018, meeting, the NYONair NYC lead pilot wrote: "Tethers and cutters - we are going forward with a bulk inventory purchase which includes the new style tether and cutters which are much easier to use." She said the reception to the proposal had been enthusiastic, and that management was accepting of the change. She also stated that she believed new equipment was on order. The NYONair chief of staff said that NYONair had made a decision to purchase the new equipment, but it had not been ordered before the accident occurred. She stated that the Liberty safety pilot had provided the information that she needed for purchasing the new equipment six days before the accident.

8.2.3.2.6 Cold Weather Operations

Cold weather operations were first addressed in the October 1, 2017, minutes. These minutes spelled out a cold weather operations policy. It stated that flights could be operated with the doors open for the entire flight if the temperature was above 45 degrees F. Sliding doors would be used when the temperature was between 25 and 45 degrees F. Sliding windows were to be used for temperatures below 25 degrees F. The minutes reported that four aircraft were outfitted with dual sliding doors for cold weather operations and that Liberty was going to upgrade a few more aircraft as winter approached. Minutes dated November 5, 2017, reported that there was "no update" on sliding doors. Minutes dated November 12 and 19, 2017, reported other strategies that were being planned to facilitate cold weather operations, including gloves, heated clothing, and increased breaks for pilots. The November 12 minutes stated "if any passenger requests to go back early the pilot will honor that request no matter where they are in the flight. In addition, if the pilot feels unsafe or too cold to fly they will take a break or find replacement pilot (speak with ops)."

Minutes dated November 19, 2018, provided the following update on cold weather operations:

> *…cold weather flights have been going well. The order has been put in for heated clothing and gloves for the pilots. This should help pilots performing multiple flights going forward. However, please take a break or switch pilots if there is any issue with loss of feeling in the extremities or general discomfort.*

Minutes dated December 13 and 17, 2018, reported that pilot gloves had arrived and were being tested, but that they were either too thin to keep pilots' hands warm or so thick that they interfered with pilot control of the helicopter. Minutes dated December 31, 2017, stated:

> *Doors-on flights have been going well with little passenger complaints. We are still searching for a cutoff temperature that we can adhere to so expectations for pilots and passengers can be set.*

January 10, 2018, text messages between the NYONair director of business operations, the NYONair CEO, Liberty's director of training, and Liberty's chief pilot discussed cold weather launch decision making. The director of business operations messaged the CEO:

> *Something to put on your radar*
> *Liberty declined our 10am classic today*
> *Apparently too cold for 30m even thought it is sunny and just over 30 deggrees [sp]. It's cold but weve [sp] flown in this before*
> *We're covering with our own ship. But looks like Liberty taking the easy way out despite being in a tough spot right now.*

The CEO messaged Liberty's director of training and chief pilot asking if he had been involved with the decision, and the director of training replied:

> *Yes called [the Liberty director of operations]. It was 26 deggrees [sp] and was lucky if we hit 30 degrees for takeoff. We just wanted to keep it the way it's been when it got cold before. I just asked for keeping it a 15 minute. [The Liberty director of operations] agreed.*

The CEO replied:

> *I don't know if you heard this Brent. But saker [sp] gave Liberty their 30 days notice.*
> *Make you should bid for their sightseeing spot*
> *Lib is on a respirator*
> *It's a gorgeous morning*
> *Not a true 30 feel*
> *Sr has an ear full coming*
> *From 80 degrees in Florida*
> *Amazing*
> *How so just don't get it*

The director of training responded:

> *The next 30 is at 1500 and will be plenty warm enough. It was just the 30 minute to start the day.*

The CEO replied

> *Last time [Saker CEO] served [Liberty CEO]*
> *Liberty had money*
> *[Liberty COO] has 500k in the bank*
> *Hmmmm*
> *It's winter*
> *30 day you need to hire a lawyer and fight*
> *Writing on the wall*
> *Just a curtesy heads up [director of Training]*
> *[Director of training] do you know when money doesn't come in how many people stick around?*
> *Hmmm*
> *Zero*
> *No one to train*
> *This morning has happened for us without safety concerns before*
> *It threw a major wrench in the day*
> *My brand because Liberty's management is a [profanity] mess and now my problem*
> *Is getting destroyed because it touching the likes of Liberty*
> *Just FYI*
> *This isn't a game this called hard work to do something when everyone else is against you*

Liberty's chief pilot sent a brief reply to this series of messages asking the CEO to call him. Liberty's safety officer said Liberty stood by the pilots during this episode, but questions remained in the pilots' minds about "how big an issue" it was.

8.2.3.2.7 Passenger Seatbelts

Passenger seatbelt issues were referenced in several sets of minutes. Minutes from an August 9, 2017, meeting stated, "Seatbelts - We have had some controversy with the "blue painter's tape" on the seatbelts. CX - please let the pilot decide whether or not they want the tape and act accordingly. We are trying to phase this out with the addition of seat belt brackets on the seats." Minutes from September 6, 2017, stated, "We are looking at a bungee system to restrain seatbelts from falling outside aircraft if they are inadvertently unbuckled. We also mentioned CX could take a quick video of the aircraft after every flight…" Minutes from October 29, 2017, stated, "Shoulder straps are working out relatively well. Passengers in adventure seats are now taking off the seatbelt as ONE UNIT and buckling behind them. Brent is securing more rubber stoppers so that the [sp] should strap does not pop off the lap belt so easily."

Minutes from November 5, 2017, stated, "Vigilance about seatbelt - please be continually watchful regarding passengers removing their seatbelt during flights, either on purpose or accidentally. Winter clothing can be cumbersome and it's easy to bump the seatbelt off. Also note if passengers do not speak English and are having a hard time understanding instructions." The last mention of passenger seatbelt issues appeared in minutes from November 12, 2017, which stated, "[The Liberty director of training] is looking into creating a mockup of the seatbelt setup for KP so pax can practice before coming to the aircraft. He is also researching other seatbelt designs that cannot be easily bumped off in flight."

8.2.3.2.8 Safety Reporting

Safety reporting was mentioned in the minutes from one meeting dated September 24, 2017, which stated that any safety issues were to immediately be reported to Liberty's director of training or chief pilot, rather than waiting to discuss them in a pilot meeting.

NYONair's chief pilot said that NYONair did not have a safety reporting program, but any pilot could approach the company with safety concerns. The CEO of NYONair said that the company sent passengers a feedback form, and passengers were also not shy about providing feedback on social media sites that were monitored by NYONair's social media manager.

8.2.3.3 Safety Award

According to NYONair's CEO, NYONair had not undergone any independent safety audits. According to interviews and NYONair's website,[59] NYONair was the recipient of an Eastern Region Helicopter Council (ERHC) 2017 Safety Award for Ground and Flight Safety. This award, dated September 16, 2017, was displayed in the form of a plaque on the reception desk at the company's NYON Terminal. It stated:

> *For their commitment to ground and flight safety while performing aerial photography operations around the United States. NYONair routinely applies stringent safety protocols and provides a strong safety culture within their team. We salute you!*

[59] Source: https://www.flynyon.com/.

NYONair's NYC lead pilot stated that NYONair had received the award through a nomination process. Liberty's chief pilot, who served as vice president of the ERHC, told investigators he nominated NYONair for the award.[60] On its web site, the ERHC described itself as a nonprofit organization incorporated in 1979 as the "eastern seaboard's first, locally organized aviation group to represent helicopters." [61]

8.2.3.4 **NYONair's Perceptions of NYONair Safety Culture**

NYONair's CEO was not directly asked about his perceptions of the company's safety culture. He stated that he was not directly involved in follow-up actions to address safety issues, but that for any recommendations that made it to his desk (which he said primarily occurred via the minutes of pilot meetings), his tagline was if that was what they wanted it and it improved the safety of passengers, they should spend the money and get it.

NYONair's COO said he was not involved with the day to day operations of NYONair. He stated that the safety culture at NYONair was of utmost importance. He said they had a lot of people with lot of experience that had the same mindset, and it was not a "willy-nilly" thing going on. Safety was constantly at the forefront of their thinking. They had aviation professionals with years and years of experience that were a part of the entire company, and also at Liberty for that matter. He stated that the safety aspect was front and foremost a huge component of what they were trying to do, and they wanted their passengers to feel safe. They really made sure they felt safe, through the briefings and how they were secured.

NYONair's chief of staff said safety was NYONair's number one priority. She said she would not feel comfortable if she could not go to bed knowing they did everything they could think of to keep their passengers and customers as safe as possible, and she was very saddened that the accident had occurred. The director of business operations said that NYON had a "customer experience culture", meaning that they wanted every customer to have an incredible time and remember them for all the right reasons. Asked for his perceptions of the company's safety culture, he said safety was NYONair's number one concern.

NYONair's NYC lead pilot said safety was the number one priority over everything at NYONair, even customer service, and that they took the time to ensure everything was safe. NYONair's chief pilot said NYONair's safety culture had been incredible compared to other operators he had worked for, particularly their methods and procedures. He felt comfortable raising any safety concerns with management. He said most of the safety concerns he had brought up had been immediately processed before moving forward.

A NYONair flight follower who also worked for Liberty stated that NYONair took safety seriously. He stated that they were always ordering new equipment and testing new equipment, and they had won a safety award from the Eastern Region, so it was "pretty noted" that they went

[60] In an internal Liberty email (dated February 8, 2018) that was provided to investigators, the Liberty Helicopters chief pilot listed his title as "chief pilot, DER, Liberty Helicopters" and "Vice Chairman, Eastern Region Helicopter Council."

[61] A web site for the Eastern Region Helicopter Council stated that it was a nonprofit organization incorporated in 1979 and "the eastern seaboard's first, locally organized aviation group to represent helicopters." http://www.erhc.org/AboutUs.asp, retrieved December 19, 2018.

above and beyond to be safe with their capabilities. He could not recall an instance where he had questioned the safety and credibility of the company. He said they had always strived to be the safest they could be.

8.2.3.5 NYONair's Perceptions of Liberty Safety Culture

The NYONair flight operations manager, who also worked for Liberty, was asked to describe the safety culture at Liberty. He recalled that in late 2015 or early 2016, they had deployed helicopter floats in a hangar. He said that the pilots had not had the opportunity to do that before, and everyone was around and watching and the event was video recorded. From what he understood, there was a malfunction with the floats, and everyone thought it was a funny joke. Looking back, he thought it probably was not very funny, and it should have been taken more seriously. He said that aside from that, he did not have any safety concerns. He knew that the director of training took his job very seriously. He said if there were any issues, they would usually call the chief pilot, director of operations, or maintenance.

9.0 Relevant Systems

9.1 Emergency Flotation System

The accident helicopter had an emergency floatation system manufactured by Dart Aerospace and were installed on the helicopter in 2013. For detailed information on the emergency floatation system installation, procedures, limitations and performance, see the Floatation System Group Chairman's Factual Report in the docket for this investigation.

9.1.1 Pilot Training on Emergency Flotation System

According to the Liberty Helicopters chief pilot, director of training and other Liberty Helicopters pilots, training was provided for use of the float system and was also part of the pre-flight of the helicopter. According to interviews, pilots who were present during the recurrent 36-month inspection of the float system would be provided an opportunity to deploy the float system. According to the accident pilot, he participated in the mechanical activation of the float system during a maintenance test in December 2017 on the accident helicopter (N350LH), and stated that there were no malfunctions during the test.[62]

According to the Liberty Helicopters chief pilot, when asked about specific training for the floats, he said pilots were trained that if they had an engine failure, they should activate the floats as soon as practical, and land on the water.

The Liberty Helicopters training captain stated that ditching scenarios were discussed in training and that the water was considered the appropriate landing zone in the event of an emergency autorotation. Training during new hire and recurrent cycles included a powerpoint presentation and a talking-points classroom discussion guide.[63]

[62] For additional information, see Flotation Group Chairman's Factual Report in the docket for this investigation.
[63] See Attachment 1 – Interview Summaries. For additional information on pilot training of the emergency floatation system, see Emergency Floatation System Group Chairman's Factual Report in the docket for this investigation.

10.0 Relevant Procedures

10.1 Cockpit Checklist

The Liberty Helicopters Flight Operations Manual, Section 3.25, page 3-34 stated the following in part:

> *Liberty Helicopters will provide, in current and appropriate form, accessible to the pilot at the pilot station, a cockpit Checklist. The Checklist will comply with the requirements listed in FAR 135.83, where applicable to the operation, and the pilot shall use them.*[64]

10.2 Passenger Briefing

10.2.1 General

As previously mentioned, Title 14 *CFR* Part 91.107 described the required use of seat belts, shoulder harnesses, and child restraints, and required that the pilot brief passengers on their use. The Liberty Helicopters Flight Operations Manual, Section 5.5 Passenger Briefing, provided items the PIC was required to orally brief passengers prior to each takeoff.[65] The list of items included the following:

- *Smoking*
- *Seat Belts*
- *Doors and Emergency Exits*
- *Location of Survival Equipment*
- *Location and Use of Fire Extinguishers*
- *Ditching Procedures*
- *Portable Electronic Devices*

FAA Advisory Circular (AC) 91-32B "Safety in and Around Helicopters" (dated June 2, 1997) provided safety guidelines for persons associated with helicopter operations and suggested ways to avoid hazards and reduce the risk of accidents. The AC included the guidance for passenger briefings, and stated the following in part:

> *Briefing. The type of operation being conducted will dictate what type of briefing is necessary. For all flight, pretakeoff briefings should include the following items:*
>
> (1) *The use of seat belts, including shoulder harnesses, if installed.*

[64] See Attachment 21 - Eurocopter SA-350 Checklist.
[65] For a detailed list of the briefing requirements, see Attachment 6 - Liberty Helicopters Passenger Briefing.

(2) *Location and means of opening exits, egress procedures and, for overwater flights, ditching procedures and the use of flotation equipment.*

(3) *Location and use of all emergency gear and survival equipment on board, appropriate to the type of operation conducted.*

(4) *Applicable smoking restrictions in the aircraft and on the ground.*

10.2.2 Passenger Briefing – FlyNYON Flights

Liberty Helicopters and NYONair passengers flying on FlyNYON flights were briefed on the use of the NYONair-supplied harness/tether system by means of a 3-minute video safety briefing, a briefing by NYONair CX's and the pilot. According to interviews, Liberty Helicopters pilots were not provided with a standardized briefing for passengers secured to Liberty Helicopters aircraft by means of a harness, tether and locking carabiner.[66] There was no standard briefing card, and each pilot could conduct what they deemed to be their own safety briefing for FlyNYON flights. The NYONair NYC lead pilot stated that FlyNYON did not have an approved briefing card since it was all covered in the safety briefing.

The Liberty Helicopters Training Manual did not reference pilot training and evaluation on passenger briefings for the harness/tether system used on Liberty Helicopters aircraft, and the manual did not reference any training or evaluation standard for Liberty Helicopters pilots on the briefing of passengers using of the harness/tether system on Liberty Helicopters operating FlyNYON flights.

In addition, the Liberty Helicopters Flight Operations Manual did not list any policy, procedures, checklists or guidance related to the briefing of passengers using the harness/tether system on Liberty Helicopters operating FlyNYON flights.[67]

According to interviews with Liberty Helicopters and NYONair management, safety officers and pilots, along with the FAA, there was no risk analysis conducted on how to brief passengers using the harness/tether system used on any FlyNYON flights conducted by either operator.

10.3 NYON SOPs

Prior to NYONair contracting with Liberty Helicopters to operate FlyNYON flights, NYONair had their own set of SOPs (standard operating procedures) pilots used for FlyNYON flights. In

[66] Liberty Helicopters pilots were provided "customer service" guidance for FlyNYON flights operated by Liberty Helicopters pilots, from the Liberty Helicopters Safety Officer. The guidance did not include a safety briefing on the harness/tether system used on FlyNYON flights. See Attachment 22 – NYON Customer Service Pilot Training.

[67] The NYONair CX Training Manual included a "Helicopter Safety Checklist (for pilot)." See Attachment 16 - NYONair CX Training Manual.

early August of 2017, Liberty Helicopters pilots developed revised SOPs for the FlyNYON flights since the majority of FlyNYON flights were being operated by Liberty Helicopters pilots. After completion of the revised SOPs, in November of 2017 Liberty Helicopters and NYONair pilots were trained on the new SOPs, which were in use at the time of the accident.[68]

Pilot training for the procedures used on FlyNYON flights was accomplished through a powerpoint presentation created by the NYONair NYC lead pilot in New York, and the SOPs that were developed by Liberty Helicopters pilots.[69] According to the NYC lead pilot, there was hands-on training where she would work with a new pilot in the hanger on the proper use of the harness, tether, and entire process from the time the passenger arrived, boarded the aircraft, and then exited the aircraft. According to NYONair NYC lead pilot in New York, the procedures and training program for FlyNYON flights was not submitted to the FAA for review.[70]

Investigators reviewed a copy of the NYON Loading SOPs, marked "Revision 5." The document stated, "THE PILOT WILL TETHER IN ALL PASSENGERS! This will ensure that this is always done to the pilot's preference. However, the standard is a tight tether and tight harness before we ask the passenger to lean out. Always be aware of the slack in the harness." The SOPs did not specify whether, or how, excess loops of the front seat passenger's tether were to be secured to avoid having them dangle on the floor if the passenger leaned back. Liberty's loader stated that his informal practice was to secure any excess length of tether for the front seat passenger to the carabiner located between their shoulder blades.

The NYON SOPs also did not specify which attachment point should be used to secure a lanyard to the blue harnesses. Liberty's safety officer said his informal practice was to give the passenger the option regarding the choice of attachment point. He said he always pushed for the attachment point on the passenger's lower back, but that he attached it however they were more comfortable. Some passengers were more comfortable with the higher attachment point.

The Liberty Helicopters Training Manual did not reference pilot training or evaluation on NYON SOPs using any harness/tether system on Liberty Helicopters aircraft, and the manual did not reference any training or evaluation standard for Liberty Helicopters pilots on the NYON SOPs for passengers using the harness/tether system on Liberty Helicopters operating FlyNYON flights. The NYON SOPs were not included in the Liberty Helicopters Training Manual or the Liberty Helicopters Flight Operations Manual.

10.4 Emergency Egress

The Liberty Flight Operations Manual, Emergency Procedures, Section 4.5, Emergency Evacuation Duties, stated the following in part:

4.5 Emergency Evacuation Duties

[68] See Attachment 11 - NYON SOPs.
[69] See Attachment 12 - NYONair Part 91 New Pilot Onboarding Presentation.
[70] See Attachment 1 – Interview Summaries.

A. The Pilot-in-Command is responsible to insure [sp] that all passengers are properly briefed as to location and use of all survival equipment and emergency exits. The Pilot-in-Command will also insure [sp] the following is accomplished:

1. The execution of any procedures necessary to affect a safe completion of an emergency to include the control of the aircraft and the operation of all emergency equipment.

2. As early as practical, additional instructions to the passengers to assist in the safe evacuation of the aircraft by all occupants.

3. The Pilot-in-Command shall insure that each person who may need assistance to move to or exit if an emergency occurs, and that person's attendant, if any, has received a briefing as to the procedures to be followed if an emergency evacuation becomes necessary. That person needing assistance will be placed in the most practical position to facilitate his access to an exit without impeding the exit of the other passengers.

The Liberty Helicopters Training Manual did not reference pilot training and evaluation on briefing evacuation using the harness/tether system used on Liberty Helicopters aircraft, and the manual did not reference any training or evaluation standard for Liberty Helicopter pilots on the evacuation of passengers using of the harness/tether system on Liberty Helicopters operating FlyNYON flights.

In addition, the Liberty Helicopters Flight Operations Manual did not list any policy, procedures, checklists or guidance related to the evacuation of passengers using of the harness/tether system of harnesses and tethers on Liberty Helicopters operating FlyNYON flights.

According to interviews with Liberty Helicopters and NYONair management, safety officers and pilots, along with the FAA, there was no risk analysis conducted on the passenger evacuation of the helicopter donning the harness/tether system used on any FlyNYON flight conducted by either operator.

According to multiple interviews with Liberty Helicopters and NYONair personnel, no evacuation drills were ever conducted using the NYONair-supplied harness/tether system used on FlyNYON flights. In addition, according to multiple pilot interviews, Liberty Helicopters and NYONair pilots were never trained on passenger egress using the NYONair-supplied harness/tether system.

10.5 Engine Failure and Autorotation

According to the Rotorcraft Flying Handbook (FAA-H-8083-21), page 3-8, an autorotation is the state of flight where the main rotor system is being turned by the action of relative wind rather than engine power. It is a means by which a helicopter can be landed safely in the event of an engine failure by using altitude as potential energy and converting it to kinetic energy during the descent and touchdown.

The Liberty Helicopters Training Manual, Section K-1.2 AS350 Emergency Maneuvers, page Section K-1-4, stated the following in part:

1. *Reduce collective pitch and monitor and control N_R (rotor speed) with collective while establishing the optimum autorotative airspeed of 65 kts. Confirm actual engine failure by checking T_4 and that the generator is inoperative, then move the fuel flow control to the shutdown position.*
2. *According to the cause of the loss of the engine:*
    a. *Re-light the engine if the aircraft is at or below 13,000 feet; however, a re-light may, and should be attempted throughout the envelope time and situation permitting.*
        i. *During an en flight [sp] relight, ensure the booster pump(s) are turned on, the generator is turned on and wait until N_G (gas producer) falls below 30% before attempting a normal starting procedure. In order to avoid any jerk on re-synchronization, accelerate the engine progressively, when N_2 (free turbine) speed approaches N_R (rotor speed).*

    NOTE: This procedure may be too complex to be attempted given altitude or airman workload at the time of the engine loss.

    b. *If re-lighting the engine is not a consideration, closer the fuel shut-off valve and switch off the fuel booster pump and generator; and, if installed – the alternator. If there is a smell of electrical burning; switch off all electrical power by pushing the "All Off" electrical master switch.*
3. *Maneuver to bring the helicopter as close as possible into the wind an at a height of approximately 65 feet, flare to a nose-up attitude. At a height of 20-25 feet, and at a constant attitude, gradually apply collective pitch to reduce the sink-rate. Just prior to touchdown, level the helicopter to a landing attitude and cancel any side-slip tendency using the anti-torque pedals. Maintain a slow sink-rate with collective and cushion the touchdown with remaining collective pitch.*
4. *Upon touchdown, hold collective stationary until termination of ground run. The surface condition shall determine the amount of ground run appropriate to the landing. Maintain heading with pedals. Level with the cyclic to prevent the skids from digging in and when forward motion stops, slowly lower collective.*

    NOTE: It is possible that the tail skid may touch the ground first.

The Airbus AS-350 B2 VEMD Flight Manual, Section 3.2 Emergency Procedures, for an autorotation landing following an engine failure, stated the following in part:

1. Collective pitch ..... REDUCE to maintain NR in normal operating range.
2. IAS ..... SET to 65 Kt (120 km/h).

- If relighting impossible or after loss of tail rotor thrust:

3. FFCL ..... OFF detent

Time, height and circumstances permitting:
- Fuel shutoff cock ..... OFF
- FUEL P (both) ..... OFF
- EMER SW ..... OFF

4. Maneuver the aircraft into the wind on final approach.

At height ≈ 70 ft (21 m):

5. Cyclic stick ..... FLARE.

At 20/25 ft (6/8 m) and at constant attitude

6. Collective pitch ..... GRADUALLY INCREASE to reduce the rate of descent and forward speed.
7. Cyclic ..... FORWARD to adopt a slightly nose-up landing attitude (< 10°).
8. Pedals ..... ADJUST to cancel any sideslip tendency.
9. Collective pitch ..... INCREASE to cushion touch-down.

- After touch-down

10. Cyclic, collective, pedals ..... ADJUST to control ground run.

- Once the aircraft has stopped

11. Collective pitch ..... FULL LOW PITCH.
12. Rotor brake ..... APPLY below 170 rpm.

AUTOROTATION PROCEDURE OVER WATER

Apply same procedure as over land, except items 10, 11 and 12, but maneuver to head the aircraft equally between the wind and wave direction on final approach. Ditch with minimum forward speed (IAS < 30 kt (56 km/h)) and rate of descent. Then apply following check list for items 10, 11, 12.

- After touch-down

10. Collective pitch ..... MAINTAIN.
11. Doors jettison handles ..... PULL-UP.
12. Rotor brake ..... APPLY.

Abandon aircraft once the rotor has stopped.

10.6 Ditching[71]

The Liberty Helicopters Training Manual and Flight Operations Manual both discussed ditching with emergency floatation gear.[72] The Training Manual also referenced the Aircraft Flight Manual Emergency Procedures. The Liberty Helicopters Training Manual, Section K-1 stated the following in part:

> *In the event of an engine failure or other need for ditching, check rotor r.p.m. and apply the following procedure.*
>
> *a) Arm the emergency flotation gear.*
> *b) Fire the floatation gear (Recommended maximum firing speed 80kts)*
> *c) Complete the autorotation procedure as described in the basic Manual.*
> *d) Touch down speed must be below 10kts.*
> *e) Alright broadside-on to the sea: Avoid ramming the nose of the floats on touch down.*
> *f) If aircraft is afloat, evacuate when emergency help arrives.*
> *g) If aircraft is sinking, release the seatbelts when the cabin is submerged. Evacuate the aircraft and then inflate the life vests.*
>
> *Note: Inflation of emergency floatation gear reduces the rotor speed by 20 rpm in autorotation descent.*
>
> *IMPORTANT NOTE: WHEN THE HELICOPTER IS AFLOAT. THE FORWARD DOORS MUST BE OPENED BY ACTUATIONG THE JETTISON CONTROL.*

The Eurocopter AS-350 B2 VEMD Flight Manual Supplement for Apical Emergency Float Kits, Emergency Procedures[73], stated the following in part:

> In the event of an emergency necessitating a landing on water, carry out the emergency procedure outlined in the basic Flight Manual with the addition of the following:
>
> • Reduce airspeed to a maximum of 75 kt.
>
> • Inflate the floats by actuating the Float Activation Handle on the cyclic control.

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[71] FAA AC 27-1B Certification of Normal Category Rotorcraft (dated September 20, 2008), paragraph AC 27.801, stated the following in part: *Ditching may be defined as an emergency landing on the water, deliberately executed, with the intent of abandoning the rotorcraft as soon as practical. The rotorcraft is assumed to be intact prior to water entry with all controls and essential systems, except engines, functioning properly.* NTSB Safety Study 85/02 "Air Carrier Overwater Emergency Equipment and Procedures" stated the following in part*: [ditching] usually means a planned water event in which the flight crew, with the aircraft under control, knowingly attempts to land in water. In contrast to an inadvertent water impact, in which there is no time for passenger or crew preparation, ditching allows some time for donning life preservers, etc.* See also NTSB Accident Report NTSB/AAR-10/03 "Loss of Thrust in Both Engines After Encountering a Flock of Birds and Subsequent Ditching on the Hudson River (US Airways Flight 1549, Airbus A320-214, N106US, Weehawken, New Jersey, January 15, 2009).

[72] Source: Liberty Helicopters Training Program, Section K-1. For specific information regarding the emergency floatation system installed on the accident helicopter, see Emergency Floatation System Group Chairman's Factual Report in the docket for this investigation.

[73] For additional information, see Emergency Floatation Systems Group Chairman Factual Report.

NOTE

The Float Activation Handle incorporates a shear pin to protect against inadvertent inflation. The shear pin requires approximately 12 lbs. of force to shear. It is recommended that the upper part of the handle be used to assist in breaking the shear pin. After the shear pin is broken, the handle must be pulled further aft to inflate the floats.

• Make a normal power on or autorotation approach as required except keep the final flare as level as possible.

• Recommend maximum speed for water contact is 10 kt. or less.

• Landings on water must be made with the helicopter as level as possible. One-float-first landings may produce undesirable but controllable yaw. For power on landings, reduce speed after touchdown to 5 kt or less before lowering collective.

NOTE

Inflation of the emergency floats reduces rotor RPM by approximately 10 RPM. in autorotation descent.

NOTE

Time for complete inflation of the floats is approximately 5 to 6 seconds.

In addition, the Liberty Flight Operations Manual contained a section, listed under Emergency Procedures, Section 4.2, Emergency Water Landings, which stated the following in part:[74]

4.2 Emergency Water Landings

A. All single engine helicopters are equipped with emergency Pop-Out Floats. All flight crew are properly trained in procedures to follow should deployment of the Pop-Out Floats be necessary.

B. Pilots and passengers are provided with life vests. In the event of a forced landing on water is necessary, all occupants of the aircraft should don their life vests. Pilots will brief their passengers on the proper use of the life vests and caution them not to inflate them until outside the aircraft. Under normal circumstances (the aircraft floating comfortable on the water) the passengers should remain in the aircraft.

C. All helicopter flights will be on a flight plan. A search will begin as soon as an aircraft is overdue or a radio distress call is received. The nearest Flight Service Station will be notified and the dispatching of Company aircraft that may be available for search.

[74] See Attachment 7 - Liberty Helicopters Emergency Procedures.

D. After completion of the emergency landing on water, all personnel should remove their seat belts and don their life vests. Stay in the aircraft unless it is in danger of turning over (Pilot-in-Command should make this determination). If the aircraft is in danger of turning over, personnel should exit the aircraft and inflate their life vests. In all cases, personnel should remain with the aircraft, if at all possible to expedite their rescue."

11.0 Federal Regulations Covering the Accident Flight

11.1 Title 14 *CFR* 119.1

Title 14 *CFR* 119.1 addressed 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. The regulation also exempted airplane, helicopter, and balloon air tour operations from compliance with 14 *CFR* 135 and 121.

Title 14 *CFR* 119.1 Applicability stated the following:

(a) This part applies to each person operating or intending to operate civil aircraft -

(1) As an air carrier or commercial operator, or both, in air commerce; or

(2) When common carriage is not involved, in operations of U.S.-registered civil airplanes with a seat configuration of 20 or more passengers, or a maximum payload capacity of 6,000 pounds or more.

(b) This part prescribes -

(1) The types of air operator certificates issued by the Federal Aviation Administration, including air carrier certificates and operating certificates;

(2) The certification requirements an operator must meet in order to obtain and hold a certificate authorizing operations under part 121, 125, or 135 of this chapter and operations specifications for each kind of operation to be conducted and each class and size of aircraft to be operated under part 121 or 135 of this chapter;

(3) The requirements an operator must meet to conduct operations under part 121, 125, or 135 of this chapter and in operating each class and size of aircraft authorized in its operations specifications;

(4) Requirements affecting wet leasing of aircraft and other arrangements for transportation by air;

(5) Requirements for obtaining deviation authority to perform operations under a military contract and obtaining deviation authority to perform an emergency operation; and

(6) Requirements for management personnel for operations conducted under part 121 or part 135 of this chapter.

(c) Persons subject to this part must comply with the other requirements of this chapter, except where those requirements are modified by or where additional requirements are imposed by part 119, 121, 125, or 135 of this chapter.

(d) This part does not govern operations conducted under part 91, subpart K (when common carriage is not involved) nor does it govern operations conducted under part 129, 133, 137, or 139 of this chapter.

(e) Except for operations when common carriage is not involved conducted with airplanes having a passenger-seat configuration of 20 seats or more, excluding any required crewmember seat, or a payload capacity of 6,000 pounds or more, this part does not apply to -

(1) Student instruction;

(2) Nonstop Commercial Air Tours conducted after September 11, 2007, in an airplane or helicopter having a standard airworthiness certificate and passenger-seat configuration of 30 seats or fewer and a maximum payload capacity of 7,500 pounds or less that begin and end at the same airport, and are conducted within a 25-statute mile radius of that airport, in compliance with the Letter of Authorization issued under § 91.147 of this chapter. For nonstop Commercial Air Tours conducted in accordance with part 136, subpart B of this chapter, National Parks Air Tour Management, the requirements of part 119 of this chapter apply unless excepted in § 136.37(g)(2).[75] *For Nonstop Commercial Air Tours conducted in the vicinity of the Grand Canyon National Park, Arizona, the requirements of SFAR 50-2, part 93, subpart U, and part 119 of this chapter, as applicable, apply.*

(3) Ferry or training flights;

(4) Aerial work operations, including -

(i) Crop dusting, seeding, spraying, and bird chasing;

(ii) Banner towing;

(iii) Aerial photography or survey;

(iv) Fire fighting [sp];

(v) Helicopter operations in construction or repair work (but it does apply to transportation to and from the site of operations); and

(vi) Powerline or pipeline patrol;

(5) Sightseeing flights conducted in hot air balloons;

[75] According to the Liberty Helicopters Flight Operating Manual, Chapter 2.6 (page 2-4), "all [Liberty Helicopters] Commercial Air Tours will be conducted in accordance with FAR 136." Liberty Helicopters OpSpecs B057 authorized the operator to conduct commercial operations, as defined in 14 *CFR* 136.3, below 5,000 feet above the ground (agl) and over or within ½ nautical mile (nm) of the following national park unit(s) and/or abutting tribal land(s), in accordance with Part 136 and the conditional, limitations, and provisions in the OpSpecs. Liberty Helicopters was limited to maintaining a 1,000 foot horizontal radius distance from the Statue of Liberty National Park boundary (high water mark) and Ellis Island from the tour aircraft for the purpose of Commercial Air Tours at altitudes referenced in CFR 91.119(d).

(6) Nonstop flights conducted within a 25-statute-mile radius of the airport of takeoff carrying persons or objects for the purpose of conducting intentional parachute operations.

(7) Helicopter flights conducted within a 25 statute mile radius of the airport of takeoff if -

(i) Not more than two passengers are carried in the helicopter in addition to the required flightcrew;

(ii) Each flight is made under day VFR conditions;

(iii) The helicopter used is certificated in the standard category and complies with the 100-hour inspection requirements of part 91 of this chapter;

(iv) The operator notifies the responsible Flight Standards office at least 72 hours before each flight and furnishes any essential information that the office requests;

(v) The number of flights does not exceed a total of six in any calendar year;

(vi) Each flight has been approved by the Administrator; and

(vii) Cargo is not carried in or on the helicopter;

(8) Operations conducted under part 133 of this chapter or 375 of this title;

(9) Emergency mail service conducted under 49 U.S.C. 41906;

(10) Operations conducted under the provisions of § 91.321 of this chapter; or

(11) Small UAS operations conducted under part 107 of this chapter.

Title 14 *CFR* Part 135 required an operator to hold an Air Carrier Certificate or Operating Certificate. For its Part 135 operations, Liberty Helicopters was authorized to conduct on-demand operations in common carriage pursuant to 14 *CFR* 119.25(b) (Rotorcraft On-Demand) per FAA operating certificate number MHIA082G.

Title 14 *CFR* 91.147 allowed an operator to conduct nonstop passenger-carrying flights in an airplane or helicopter for compensation or hire that begin and end at the same airport and are conducted within a 25-statute mile radius of that airport, provided the operator had a Letter of Authorization (LOA).[76] The LOA identified the following requirements:

(1) Name of Operator, agent, and any d/b/a (doing-business-as) under which that Operator does business;
(2) Principal business address and mailing address;
(3) Principal place of business (if different from business address);
(4) Name of person responsible for management of the business;

[76] Liberty Helicopters held a LOA with the FAA, permitting its' flights to operate under the provisions of 91.147. See Attachment 9 – Liberty Helicopters LOA. In addition, when asked if the accident flight was conducted under a Liberty LOA for Part 91 operations, the Liberty Helicopters director of operations said he did not know if they had to do that [operate per the LOA] for the photo flights, and thought that was only for the aerial tour flights. See Attachment 1 – Interview Summaries.

(5) Name of person responsible for aircraft maintenance;
(6) Type of aircraft, registration number(s), and make/model/series; and
(7) An Antidrug and Alcohol Misuse Prevention Program registration.[77]

Title 14 *CFR* Part 91 prescribed the rules governing the operation of all aircraft within the United States, and primarily covered general aviation flights not for compensation or hire.

According to interviews with both Liberty Helicopters and NYONair senior management, the FlyNYON flights operated by both companies were conducted under Part 91 of the *CFRs,* and did not require a LOA per 91.147. Specifically, the Liberty Helicopters director of operations stated that all Liberty helicopters operating FlyNYON flights for NYONair, including the accident flight, were conducted under Part 91 as "aerial photography" flights, and did not require the flights to be conducted under their Part 135 operating certificate.[78] Further, when asked what was the difference between the photo flight and a tour flight, the Liberty Helicopters director of operations said a photo flight was set up specifically as a photo flight, and "you would have to talk to the Washington, DC people to figure out the difference . . . in New York, you can call it whatever you want either way, but clearly the purpose of the accident flight was a photo mission."[79]

On March 21, 2018, the NTSB requested a legal interpretation of the accident flight (NTSB request 18-102) to determine which part of the Federal Regulations the flight was required to operate under, and on April 30, 2018 the FAA provided a response to the NTSB request. While the FAA response did not make a legal determination specific to the accident flight due to "incomplete" information, the narrative and discussion provided by the FAA is referenced in the subsequent sections of this Factual Report.[80]

11.1.1 Flights Exempted by 14 *CFR* 119.1

Title 14 *CFR* 119.1(e)(2) exempted certain nonstop commercial air tours from the certification requirements of part 119, and allow operators to conduct nonstop commercial air tours under the provisions of 14 *CFR* Part 91 if the operations were conducted in an airplane or helicopter having

[77] Title 14 *CFR* 91.147 covers operators conducting nonstop passenger-carrying flights in an airplane or helicopter for compensation or hire in accordance with 119.1(e)(2), 135.1(a)(5), or 121.1(d), that begin and end at the same airport and are conducted within a 25-statute mile radius of that airport, and requires and operator to register and implement a drug and alcohol testing program in accordance with Part 120 and comply with any other provisions of the Letter of Authorization received. The regulation (91.147) was created in response to NTSB Safety Recommendation A-95-59, which asked the FAA to "develop and implement national standards . . . within 14 *CFR* Part 135, or equivalent regulations, for all air tour operations with powered airplanes and rotorcraft to bring them under one set of standards with operations specifications and eliminate the [current] exception." The NTSB classified the recommendation "Closed – Unacceptable Action" on November 21, 2007, citing disagreement with the final rule's allowance that air tour flights operating and returning to the same airport and staying within a 25-mile radius of the airport can operate under Part 91. (See NTSB Safety Recommendation A-95-58, and Safety Recommendation A-14-011 and -012 NTSB response to the FAA, dated April 7, 2014). For additional information on 14 *CFR* 91.147 requirements, see Attachment 13 - FAA Air Tour Operators Document.

[78] See Attachment 1 – Interview Summaries. In addition, according to the FAA, Part 91 did not mandate surveillance like Part 135 did. See Liberty Helicopters POI interview in Attachment 1 – Interview Summaries.

[79] See Attachment 1 – Interview Summaries, and Attachment 9 – Liberty Helicopters LOA.

[80] For more detailed information on the FAA's legal interpretation of the accident flight, see Attachment 14 - FAA Legal Interpretation.

a standard airworthiness certificate, a passenger-seat configuration of 30 seats or fewer and a maximum payload capacity of 7,500 pounds or less, begin and end at the same airport, are conducted within a 25-statute mile radius of that airport, and comply with an LOA issued by the FAA under 14 *CFR* 91.147.

Title 14 *CFR* 119.1(4) further exempted those flights operating as "aerial work operations," which included "aerial photography or survey," allowing those operations to be conducted under Part 91 without holding either an air operator certificate or a LOA.

According to the FAA, with the exception of commercial air tours conducted under 14 *CFR* 119.1(e)(2) (flight within 25 miles of the departing airport), all air tour operators must be certificated under 14 *CFR* 119 to operate in accordance with Part 121 or 135. Further, the FAA stated the following:

> *This certification process enables the FAA to exercise greater oversight of certificated operators. In contrast, flights conducted under 119.1(e)(2) are operated in accordance with the general aviation requirements of Part 91; the operators do not have to be certificate under Part 119 and, thus, do not have to operate in accordance with the requirements of Part 121 or 135. The requirements of Part 121 or 135 are stricter that those of Part 91. Part 121 and 135 contain requirements for aircraft equipment performance and maintenance, crewmember training, crewmember flight and duty time limitations and rest requirements, reporting and recordkeeping and flight locating.*[81]

11.1.2 History of 14 *CFR* 119.1 Exemptions

The exception to certification requirements found in 14 *CFR* 119.1 has been used by the FAA and its predecessor, the Civil Aeronautics Administration (CAA), since at least 1954, when Part 42.0-3(b) of the Civil Air Regulations (CARs) exempted local sightseeing flights from obtaining an air taxi operator certificate if the flight returned to the point of departure without landing at other points, even if the flight involved compensation.

In 1964, the FAA enacted a new 14 *CFR* Part 135 to regulate air taxi operators and commercial operators of small aircraft. In it, the FAA recodified the nonstop commercial air tour exception as 14 *CFR* 135.1(b)(2).[82] In 1995, the FAA combined all regulations dealing with certification of air carriers and commercial operators under Part 119. The nonstop commercial air tour exception was then recodified as 14 *CFR* 119.1(e)(2).

11.1.3 Commercial Air Tours

Title 14 *CFR* 136.1(d) Applicability and Definitions,[83] which applied to anyone operating or intending to operate a commercial air tour in an airplane or helicopter, and 14 *CFR* Part 110.2

[81] Source: National Air Tour Safety Standards, Citation: 72 FR 60572-01, dated October 22, 2003.
[82] Prior to its codification under 14 *CFR* 135.1(b), similar provisions were incorporated into the CABs CAR Part 42a – Irregular Air Carrier and Off-Route Rules, § 42.0-3, which came into effect on March 25, 1954.
[83] On January 23, 2003, the FAA codified the provisions of Title VIII of the National Parks Air Tour Management

Definitions, defined a "commercial air tour" as "a flight conducted for compensation or hire in an airplane or helicopter where a purpose of the flight is sightseeing." According to the regulations, the definition included eight factors the FAA may consider when determining whether a flight is a commercial air tour, and included the following:

1. Whether there was a holding out to the public of willingness to conduct a sightseeing flight for compensation or hire;
2. Whether the person offering the flight provided a narrative that referred to areas or points of interest on the surface below the route of the flight;
3. The area of operation;
4. How often the person offering the flight conducts such flights;
5. The route of flight;
6. The inclusion of sightseeing flights as part of any travel arrangement package;
7. Whether the flight in question would have been canceled based on poor visibility of the surface below the route of the flight; and
8. Any other factors that the FAA considers appropriate.

The term "commercial air tours" was first included in the *CFR*s with the implementation of the National Air Tour Standards final rule (72 FR 6884-01) on February 13, 2007. Prior to this final ruling, the CFRs contained regulations related to "sightseeing" and "sightseeing flights". Both terms had been used in the regulations for years by the FAA but had never been defined in the regulations. In its final ruling, the terms were replaced with the term "commercial air tour" to more align with the definition contained in the 2000 Air Tour Act (also known as the National Park Air Tour Management Act of 2000), which specifically defined the term "commercial air tour operation."

Previously, Part 119.1(e)(2) applied to certain sightseeing flights for compensation or hire conducted within 25 miles of the takeoff airport and return to the same airport (not point-to-point transportation). In the National Air Tour Standards final rule, the FAA deleted the word "sightseeing" from the 25-mile exception and inserted the phrase "commercial air tour" in its place. According to the FAA, "it is important to note that commercial air tours are defined as flights of which one purpose is sightseeing. Sightseeing is one of the several factors the FAA considers when assessing whether or not a flight is an air tour operation."[84]

During the NPRM (Notice of Proposed Rule Making) period for the final rule, the FAA received comments from the industry regarding the 119.1(e)(2) provision restricting a flight to a 25-statute mile radius of the departure airport (commonly referred to as the "25-mile exception)" which relieved an operator from holding a part 119 air carrier certificate and permitted it to operate under part 91. In the final rule, the FAA referenced flights providing an "experience" for the passenger,

Act of 2000 (the Act), as a new part of its regulations (14 *CFR* Part 136). This action finalized, in cooperation with the National Park Service, a 5,000-ft. above ground level (AGL) altitude that completed the definition of "commercial air tour operation" as required by the Act. If an operator conducted an operation below 5,000 ft. AGL over a national park, and that operation otherwise met the statutory definition of a commercial air tour operation, that operator was defined as a commercial air tour operator and was required to meet the requirements of the Act and the new regulations. This final rule also codified the provisions of Special Federal Aviation Regulation 78 and the prohibition against commercial air tour flights over the Rocky Mountain National Park.

[84] See National Air Tour Safety Standards Final Rule, 72 Fed. Reg. 6894(Feb. 13, 2007).

such as flights in vintage military aircraft, historic aircraft or air show rides. In the NPRM, the FAA stated the following in part:

> *". . . . many of these commenters said they are not offering 'sightseeing' flights, and that they just let passengers 'experience' something – e.g., aviation history, military history, or freedom . . .what these commenters misunderstood is that the general rules require that someone carrying people or property for compensation or hire must comply with air carrier rules. While there are exceptions to this general rule (such as those found in 119.1(e)), there is no exception for 'experience' flights. We [FAA] believe many of these operators not only give the passengers an 'experience,' but also do some form of sightseeing and thus fall within the 25-mile exception. The same set of safety standards will apply to these flights regardless of how the operator chooses to describe them."*[85]

The FAA further stated that "although commenters have stated that sightseeing is not always a purpose of the flight, the [FAA] considers the overall character of the flight to be sightseeing, even if a primary purpose may be the experience of flight."[86]

As previously stated, the NYONair's web site stated that it was an "aviation services company that bridges the worlds of aviation, customer experience, and media." It listed NYONair services including "open door photo experience flights, aerial production services, transportation private charters, and branded media collaborations." In an interview, NYONair's CEO described FlyNYON as an "experience media brand."[87]

The NYONair director of operations in charge of the NYONair operations center personnel and scheduling classified one of his job tasks as related to "customer experience culture," and having full authority over customer communications and the policies that NYONair implemented to ensure a "good customer experience."

11.1.4 Aerial Work

Title 14 *CFR* 1.1 General Definitions and 14 *CFR* Part 110.2 Definitions do not define the term "aerial work" as used in Part 119.1. Further, according to the FAA, the term "aerial work" as found in the 119.1(e)(2) exemption was not defined in any regulation, and "the FAA has construed it to reflect the common import of its language. Thus, it means work done from the air. These flights are restricted in that (i) they must depart and arrive at the same point, (ii) no property of another may be carried on the aircraft, and (iii) only essential persons to the operation may be carried onboard. If an aerial work operation is conducted as described above, a person essential to achieving the purpose of the flight may subcontract with an operator that does not hold a part 119 operating certificate to conduct the flights under part 91."[88]

[85] See National Air Tour Safety Standards Final Rule, 72 Fed. Reg. 6895 (Feb. 13, 2007).
[86] See National Air Tour Safety Standards Final Rule, 72 Fed. Reg. 6894 (Feb. 13, 2007). As previously mentioned, Liberty Helicopters was owned by Sightseeing Tours of America.
[87] See Attachment 1 – Interview Summaries.
[88] See Attachment 14 – FAA Legal Interpretation.

In its legal interpretation of the accident flight, the FAA stated that the term "aerial work" connotes "a condition where taking pictures or filming is done from the air" and the term should be construed within the boundaries of the general concept of an aerial work operation. The exception is meant for business-like, work-related operations such as newsgathering, aerial mapping, surveying, commercial photography, or commercial filming; not for personal, entertainment, or leisure purposes. If work-related aerial photography is the sole purpose of the flight, then the operator may operate under part 91, whether (a) the operator himself performs the photographic work, (b) the operator hires a photographer to conduct the photographic work, or (c) the operator provides an aerial platform to enable photographers to conduct photographic work. This exception does not extend to operations in which the primary purpose is sightseeing.[89]

11.1.5 Aerial Photography

Title 14 *CFR* 1.1 General Definitions and 14 *CFR* Part 110.2 Definitions do not define "aerial photography" as used in Part 119.1.[90] The exemption for "aerial photography or survey" dates back to regulatory text from NPRM (27 FR 10900) "Air Taxi and Commercial Operators of Small Aircraft," dated November 8, 1962 where it was included as an exemption for air taxi operations under then Part 125.1, and subsequent inclusion in the final rule FR2988 on March 5, 1964 with the creation of part 135.1 governing "air taxi operator and commercial operators of small aircraft." Neither the previous regulation (Part 125.1) or the new regulation (Part 135) defined "aerial photography."

Further, according to the FAA, similar to the term "aerial work", the term "aerial photography" was not defined in any FAA regulation, although the FAA has provided legal interpretations that have offered opinions of what the term meant.[91] According to the FAA, the term "aerial photography" as it applied to the exemption in 119.1(e)(2) was "meant for business-like, work-related operations such as newsgathering, aerial mapping, surveying, commercial photography, or commercial filming; not for personal, entertainment, or leisure purposes. If work-related aerial photography is the sole purpose of the flight, then the operator may operate under part 91, whether (a) the operator himself performs the photographic work, (b) the operator hires a photographer to conduct the photographic work, or (c) the operator provides an aerial platform to enable

[89] See Attachment 14 – FAA Legal Interpretation. Also, see Legal Interpretation to Samuel T. Ragland, from Lorelei Peter, Deputy Assistant Chief Counsel for Regulations (May 5, 2015); Commuter Operations and General Certification and Operations Requirements Final Rule, 60 Fed. Reg. 65832, 65914 (Dec. 20, 1995).

[90] Further, the FAA stated that FAA regulations do not prohibit amateur photographers from taking pictures from the sky when engaged in commercial air tour operations, and the regulatory history of § 119.1(e)(2) and its predecessors does not address whether open door flights – with or without passengers – would be permissible. Such operations would be subject to the applicable aircraft operating and airworthiness requirements. See Attachment 14 – FAA Legal Interpretation.

[91] See Legal Interpretation to Jeffrey Hill, from Rebecca B. MacPherson, Assistant Chief Counsel for Regulations (Mar. 10, 2011); Legal Interpretation to Gregory Winton, from Mark W. Bury, Acting Assistant Chief Counsel for International Law, Legislation and Regulations (Feb. 14, 2013); Legal Interpretation to Steven Saint Amour from Mark W. Bury, Assistant Chief Counsel for International Law, Legislation, and Regulations (Sep. 8, 2014); Legal Interpretation to Samuel T. Ragland, from Lorelei Peter, Deputy Assistant Chief Counsel for Regulations (May 5, 2015). See also Attachment 14 – FAA Legal Interpretation.

photographers to conduct photographic work," and the "exception does not extend to operations in which the primary purpose is sightseeing.[92]

In its legal determination of the accident flight, and in response to a legal interpretation of the meaning and intent of "aerial photography" as it applied to 14 *CFR* 119.1(e)(2) exemption allowing the accident flight to operate without an FAA issued operating certificate or LOA (as asserted by Liberty Helicopters), the FAA stated the following in part:

> *The determination of whether an operation fits within the aerial work exception is made on a case-by-case basis. The FAA looks at the totality of the facts in light of the intent of the operator and the expectations of the passengers. An operation is not subject to the aerial photography exception, if the underlying purpose of the flight is something other than aerial work, even if, as part of the flight, the passengers take photographs with their personal cameras. Although an operator may characterize an operation as aerial work, the FAA makes the final determination based on the totality of the circumstances.*
>
> *The FAA does not dispute that the Flight in Question might have been intended to allow passengers to take pictures from the air. Nevertheless, and conceding that the FAA has incomplete information about the Flight in Question, it cannot definitely confirm that the flight qualified for the aerial work exception. There is no indication that the Flight in Question was conducted with the sole purpose of engaging in work-related photography. There is some indication that the Flight in Question was conducted for the primary purpose of sightseeing. Even if the flight was conducted for a work-related purpose, there is no indication that all of the passengers were essential to the operation.*

According to the accident pilot, for FlyNYON flights like the accident flight, Liberty Helicopter pilots would receive a "heads up" when passengers were on the way to the helicopter via text message, and the text included an image of FlyNYON's flight sheet which included a diagram of the passenger cabin, passenger names and weights, as well as the points of interest that passengers wanted to photograph. According to the NYONair NYC lead pilot in charge of training Liberty Helicopters and NYONair pilots on FlyNYON procedures, she would ask the passengers what they wanted to see during the flight, and what she could do to help them get the photo shot they wanted.

12.0 FAA Oversight

12.1 Liberty Helicopters

FAA oversight of the Liberty Helicopters operating certificate was performed through the FAA FSDO (Flight Standards District Office) located in Teterboro, NJ. According to interviews, the office was staffed with a FSDO manager and two front line managers (FLMs); one for operations and one for airworthiness.

[92] See Legal Interpretation to Pritchard H. White, from Leland S. Edwards, Jr., Attorney (May 11, 1995), and Legal Interpretation to Samuel T. Ragland, from Lorelei Peter, Deputy Assistant Chief Counsel for Regulations (May 5, 2015); Commuter Operations and General Certification and Operations Requirements Final Rule, 60 Fed. Reg. 65832, 65914 (Dec. 20, 1995).

The oversight was conducted by principal inspectors in operations, airworthiness, and avionics. The Principal Operations Inspector (POI) had been conducting oversight of Liberty Helicopters since 2013, and had oversight responsibility for four other Part 135 operators. He stated that he used a "three-tier" approach to conducing oversight; regulations, policy and inspector guidance found in Order 8900 for Part 135 operations.[93] When asked if the 8900.1 addressed surveillance of Part 91 operations, the POI said there was something in the 8900.1, but he was not sure of the details, and had not conducted ramp inspections or airman certificate inspections or base inspections for any Liberty Helicopters Part 91 operation.[94]

The POI's primary contact at Liberty Helicopters was the chief pilot,[95] and he "virtually never" interacted with the Liberty Helicopters director of operations. The POI was also unaware that the Liberty director of operations held the same position at NYONair, and was unable to name the safety officer at Liberty Helicopters.

The POI further stated he was unaware that Liberty Helicopters had an air charter contract with NYONair,[96] or that Liberty Helicopters was operating FlyNYON flights for NYONair. A review of FAA SPAS NPTRS surveillance records provided to the NTSB indicated that the most recent operations-related surveillance activity (activity code 1644) [97] prior to the accident occurred on October 12, 2017 when the POI conducted a scheduled check pilot observation of the Liberty Helicopters chief pilot in an AS-350. FAA records indicate that the POI did not conduct any other surveillance of Liberty Helicopters between that October 12, 2017 visit and the date of the accident.

According to interviews, on October 31, 2017, the FAA PMI and Principal Avionics Inspector (PAI) for Liberty Helicopters visited the Liberty Helicopters operations in Kearny, NJ to conduct a scheduled routine surveillance through their SAS[98] system, and based on a work plan item they were completing (the POI did not attend this activity). At that time, the PMI and PAI first learned that Liberty Helicopters was operating FlyNYON flights in Liberty Helicopters aircraft, and were told by the Liberty Helicopters chief pilot that the operations were Part 91 sightseeing photo flights with the doors off and the passengers were wearing restraints for the flight. The FAA inspectors

[93] FAA Order 8900.1 established the Flight Standards Information Management System (FSIMS) as a repository of all Flight Standards policy and guidance concerning aviation safety inspector job tasks. FSIMS is a Flight Standards directive, which aviation safety inspectors use as the system of record for all Flight Standards policy and guidance. For further information, go to http://fsims.faa.gov/.

[94] See Attachment 1 – Interview Summaries.

[95] The OpSpecs for Liberty Helicopters was also signed by the Liberty Helicopters chief pilot.

[96] See Attachment 8 – Liberty and NYONair Charter Customer Agreement. The agreement further stated the following in part: "NYONair is an agent of customers and an agent of FAA and Department of Transportation ("DOT") licensed air carriers and desires to market the Aircraft for commercial use."

[97] PTRS Code 1644 refers to Line Check Inspections for Parts 121 and 135. Source: FAA Order 8900.1 (CHG 38), Volume 6, Chapter 2, Section 19.

[98] According to the FAA, the Safety Assurance System (SAS) policy and procedure provide aviation safety inspectors (ASI) with standardized protocols to evaluate certificate holder programs required by regulations to be approved or accepted. SAS implements FAA policy by providing safety controls (i.e., regulations and their application) of business organizations and individuals that fall under FAA regulations through Element Design Assessments (EDAs) and Performance Assessments (PAs). For additional information, see FAA Order 8900.1 Volume 10 of FSIMS (Flight Standards Information Management System).

observed the operation and took photos of the attach points for the tether and harness systems,[99] then returned to the FSDO office to inform the FLM and POI of their observations.

According to the PMI, the October 31, 2017 visit to Liberty Helicopters was the first the FAA learned that Liberty Helicopters passengers were using harnesses equivalent to mountain climbing harnesses and lanyards [tethers] on Liberty Helicopters aircraft and attached to hard points on the helicopter.[100] The PMI said that the harnesses and lanyards were not permanently installed on the aircraft and were not part of the aircraft, the attach point limitations for the helicopter was in the manuals, but not the harness or tether information. According to the PMI, the FAA was told by the Liberty Helicopters chief pilot there was no concern that the passengers would interfere with the controls.

When asked if he had any other concerns during visit, the PMI said he was concerned with the whole operation; it was something very new to him, and he had never seen anything like that before. They voiced their opinions to Liberty, and then when they came back to the FSDO office voiced their opinions to the POI and their management.

The PMI expressed concerns about the operation since "it seemed like a very unorthodox situation."[101] After returning to the FSDO office in TEB and conferring with the POI and the FLM, the FAA inspectors determined that the flights were Part 91 operations, and that the only rule they had a surveillance authority on was the seatbelt rule (14 *CFR* Part 91.107). The FAA inspectors at the TEB FSDO did not know if there was a rule, policy or guidance governing an inspection of the Liberty operated FlyNYON flights observed by the PMI and PAI, and did not obtain a legal determination of the observed operation to verify this conclusion that the flights were allowed to be operated under Part 91.[102] The POI did not conduct any further surveillance activity of Liberty Helicopters after learning about the FlyNYON flights since the POI did not feel compelled to go out and look at the operation himself and he was comfortable that the operation could be conducted safely.[103]

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[99] See Attachment 15 – FAA Photos.

[100] Liberty Helicopters and NYONair were aware of the FAA visit. In an internal email to Liberty and NYONair pilots dated November 5, 2017 detailing the minutes of a recent pilot meeting, the NYONair NYC lead pilot stated "The FAA visited the hangar last week and observed a flight. We will be solving the harness issue shortly." The email also stated NYONair was "putting in the order soon for 20 TSO-certified harnesses. Going forward once we purchase and receive the new harness we will be phasing out the old style."

[101] See Attachment 1 – Interview Summaries.

[102] As previously stated, and as part of the investigation in this accident, the NTSB requested a legal determination of the accident flight from the FAA. See Attachment 14 – FAA Legal Interpretation.

[103] See Attachment 1 – Interview Summaries. In addition, FAA Order 8900.1 (Change 450), Chapter 2, Section 18 covered inspector guidance for operators on 121, 135, 145 and 91 Subpart K concerning oversight certificate holders "during significant changes in the operating environment that may affect the certificate holder's ability to balance resources, size, and organizational structure with operational requirements." The Order further stated "the current certificate holder environment has become extremely complex and dynamic. Certificate holders continually seek a critical balance between markets, resources, and operations in order to remain viable. This leads to continuous change, with many periods of transition while these companies adapt to different arrangements for procuring and allocating resources and managing operations. During transition periods, the certificate holders may knowingly or unknowingly accept, or even generate, an undesirable level of safety risk. These transition periods place additional responsibility on Flight Standards Service (AFS) personnel. Principal inspectors (PI) must anticipate potential hazards and evaluate the likelihood and severity of risks, to ensure that the operator is appropriately managing these risks consistently with

Liberty Helicopters management was asked by the NTSB about the FAA's knowledge of their operation of FlyNYON flights. The Liberty Helicopters director of operations said the FAA had observed their FlyNYON flights and "left with no comments." The former Liberty Helicopters director of safety said his interaction with the POI was "informal talk" and did not involve any analysis of the safety issues. The Liberty Helicopters CEO said he was told by the NYONair CEO that the FAA had looked into the harness/tether system and said it was "ok."

According to his interview and a review of FAA records, the POI did not conduct any further surveillance of Liberty Helicopters after learning the company was operating FlyNYON flights.[104]

12.2 East West Helicopter LLC Oversight

On June 27, 2008, the FAA issued a single-pilot operating certificate (number 5EWA890L) to East West Helicopter LLC, based in Harrison, Ohio. According to the NYONair CEO, NYONair purchased the certificate in January 2017, and according to FAA records on May 29, 2017, East West Helicopter LLC submitted a letter of intent to upgrade the single-pilot operating certificate to a basic operator certificate, allowing for operations of additional aircraft. A revised General Operations Manual for East West Helicopter, LLC was accepted by the FAA on August 30, 2017, and a revised OpSpecs were issued to the company on October 5, 2017, allowing for East West Helicopter LLC to begin conducting on-demand helicopter operations in common carriage per 14 *CFR* 119.25(b). The base of operations for East West Helicopter LLC was still listed as Harrison, Ohio, with a designated agent for service also located in Harrison, Ohio.[105] Further, the revised OpSpecs A001-1 for East West Helicopter LLC authorized the company to conduct business operations under the following names:

NYONair
Grasshopper
FlyNYON
FlyNYON Vegas

FAA oversight of the East West Helicopter LLC certificate was conducted from the Cincinnati (CVG) Great Lakes FSDO office (GL05). According to the East West Helicopter LLC POI, East West Helicopter LLC was also issued a LOA for its Part 91 operations in New York. The POI's primary contact with East West Helicopter LLC was through their agent for service located in CVG. East West Helicopter LLC did not have regular operations in CVG other than aircraft

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the changing conditions . . . Appropriate personnel of the certificate holding district office (CHDO) must evaluate an operator's ability to manage significant changes in its operating environment." See Attachment 20 - FAA 8900.1 Reference.

[104] For post-accident FAA actions, see Attachment 18 - FAA InFO 18003 and Attachment 19 - FAA Order 8900.457.

[105] According to FAA Order 8900.1 (Change 602), Volume 3, Chapter 18, Section 3, an agent for service is a person or company designated by the operator upon whom all legal notices, processes and orders, decisions, and requirements of the Department of Transportation (DOT), FAA, and National Transportation Safety Board (NTSB) shall be served. Once any of these documents has been served upon the operator's agent for service, the certificate holder cannot claim (legally) that it did not receive the documents. Title 49 of the United States Code (49 U.S.C.) §46103 requires air carriers to designate an agent for service.

arriving there for maintenance work conducted under their 14 *CFR* Part 145 Repair Station authorization.[106] The POI further stated that he had never visited the New York operations of East West Helicopter LLC (NYONair) and relied on communications with the PMI regarding the operations of East West Helicopter LLC New York flights.

The PMI first notified the POI that East West Helicopter LLC (NYONair) was operating FlyNYON flights, and the POI and PMI concluded that there was no requirement for surveillance of such activities. Further, following conversations with the East West Helicopter LLC agent for service, the POI and PMI determined there was no required FAA surveillance of the passenger harness/tether system used on East West Helicopter LLC (NYONair) aircraft since the operation was conducted under Part 91 and they had no guidance to tell them whether the harnessing and tethering of the passengers was being done correctly.

The POI was not familiar with the director of operations at East West Helicopter LLC, and was unaware that the director of operations at East West Helicopter LLC was also the director of operations at Liberty Helicopters. The POI told investigators he primarily interacted with the East West Helicopter LLC (NYONair) chief pilot, but had never met him.[107]

13.0 Independent Auditing

13.1 Liberty Helicopters

13.1.1 ARGUS, International

Liberty Helicopter held an ARGUS, International, INC. (ARGUS), Gold rating at the time of the accident, and advertised the rating on its website. ARGUS was an independent aviation audit company that maintained a database of participating operators in order to evaluate their history, pilot information, and aircraft information. According to its website, "ARGUS "is a specialized aviation services company whose mission is to provide the aviation marketplace with data and information necessary to make informed decisions and manage risk." The company used FAA and NTSB databases to verify the information they collected and monitored. Operators were rated in four categories; Does Not Qualify, Gold, Gold Plus, and Platinum. According to the ARGUS website, an ARGUS Gold rating was issued to operators for the following:

- Operating certificate for at least one year
- At least one turbine aircraft on certificate
- In-depth historical safety analysis
- Pilot background check and aircraft operational control validation

[106] According to the East West Helicopter LLC Flight Operations Manual, Section 2, both the operations and maintenance bases were located in Harrison, Ohio.

[107] See East West Helicopter LLC POI interview in Attachment 1 – Interview Summaries. In addition, at the time of the accident, the East West Helicopter LLC chief pilot for the company's New York operations resided in Las Vegas, Nevada. According to interviews, the NYONair NYC lead pilot, who was responsible for training Liberty Helicopters pilots and NYONair pilots on NYON procedures, was unaware of the East West Helicopter LLC POI (for the NYONair Part 135 operations).

For a Gold Plus, the items included those for a Gold rating, including completing an ARGUS on-site audit with no safety of flight findings. For an ARGUS Platinum rating, it included those for a Gold Plus, including completing an ARGUS onsite audit with zero findings, and a functional SMS (Safety Management System) and emergency response plan.[108]

According to ARGUS, the Gold rating for Liberty Helicopters was removed following the accident per ARGUS policy, pending further findings from the NTSB investigation.[109]

13.1.2 Tour Operators Program of Safety (TOPS)

According to its website, TOPS was incorporated in January 1996 as an independent, non-profit organization, and a Program of Safety was implemented that was applied to its membership who "put safety as their number one priority with the mission of making helicopter sightseeing tours among the safest type of flying today." Operators who are approved by TOPS have committed to a higher standard of safety, sharing safety knowledge and self-policing those standards. The TOPS Program covers the following areas:

- Management
- Pilot Qualifications
- Maintenance
- Ground Support Personnel
- Aircraft Equipment."

In order to become a member of TOPS, an operator must have a sightseeing base as a whole or significant part of their operations. TOPS focused primarily on an operator's air tour (Part 135) operation. Any new potential member must pass an initial safety audit and then also pass an annual safety audit. All current members were still required to pass a yearly safety audit for continued membership. According to the TOPS Audit Form for Regular Membership, TOPS maintained a "Doors On" Policy for tour flights.[110] According to news reports, TOPS members voted to add this requirement in September 2017.[111]

At the time of the accident Liberty Helicopters' public web site still indicated that it was a member of TOPS. According to the Liberty Helicopters CFO and COO, Liberty Helicopters was a founding

[108] Source: http://argus.aero/product/charter-operator-ratings/.
[109] Source: Email from ARGUS to NTSB, dated Thursday, April 12, 2018 3:16:50 PM.
[110] According to its website, the Helicopter Association International (HAI) Accreditation Program for Safety (HAI-APS) is a voluntary program that helps helicopter operators reduce accident and incident rates by improving their safety culture. HAI, the trade association for the international helicopter community, developed HAI-APS to help participating businesses "fly to a higher standard" of safety and professionalism. HAI-APS is based on two sets of performance standards: The International Standards for Business Aircraft Operations (IS-BAO), and the HAI-APS Helicopter Mission Specific Standards (HMSS). HAI developed these standards to address safety in specific missions flown by helicopter operators, and includes a doors-on requirement for accreditation. According to the HAI website, Liberty Helicopters was not an accredited member of HAI under the HAI Accreditation Program of Safety. East West Helicopter Inc. was listed as an Associate member of HAI for "Manufacturer/Suppliers/Services Suppliers" and "a full service FAA 145 Repair Station." Source: https://www.rotor.org/tools/member-directory.
[111] Source: https://www.verticalmag.com/news/faa-targets-flynyon-company-behind-craze-doors-off-flights/.

member of TOPS, but left the program in 2017 when Liberty Helicopters sightseeing operations out of the downtown Manhattan Heliport had to be reduced.[112] According to the Liberty Helicopters COO, for the company to survive financially, they had to look at various departments and see where they could save money. The COO further stated that he was responsible for the decision to leave TOPS, and that Liberty Helicopters would revisit joining TOPS again after they figured out a new business plan for the sightseeing tours downtown. He told investigators that the cost of TOPS was substantial even though it was shared among the tour operators, and in the meanwhile they would continue to follow the standards of the TOPS program. He said he was confident Liberty's chief pilot could make that happen because of his extensive industry experience.

The Liberty Helicopters director of operations stated that in order to be a member of TOPS, they were required to attend all TOPS meetings and undergo annual audits. When Liberty Helicopters lost 50 percent of its business due to reductions in flight authorizations by the city of New York, Liberty Helicopters had to cut costs and left the TOPS program.

The last TOPS audit for Liberty Helicopters was between July 19 and July 20, 2016, during which a TOPS auditor observed a 20-minute air tour flight ["Big Apple Tour"] that launched from the Wall Street Heliport on July 19, 2016. A review of the final 2016 TOPS Audit Form for regular membership, dated July 20, 2016, indicated that Liberty Helicopters was recommended for continued membership in the TOPS program.

13.2 NYONair

According to ARGUS, NYONair was not a certificated entity, and did not hold any ARGUS rating.[113] In addition, NYONair was not a member of the TOPS.

F. LIST OF ATTACHMENTS

Attachment 1 – Interview Summaries
Attachment 2 - Liberty Chief Pilot Interview (Transcription)
Attachment 3 - Police Interview Transcript
Attachment 4 - Pilot Training Information
Attachment 5 - Pilot Duty Logs
Attachment 6 – Liberty Helicopters Passenger Briefing
Attachment 7 - Liberty Helicopters Emergency Procedures
Attachment 8 – Liberty and NYONair Charter Customer Agreement
Attachment 9 – Liberty Helicopters LOA
Attachment 10 – Weight and Balance Information
Attachment 11 – NYON Loading SOPs
Attachment 12 – NYONair Part 91 New Pilot Onboarding Presentation
Attachment 13 – FAA Air Tour Operators Document
Attachment 14 – FAA Legal Interpretation

[112] According to interviews, the New York City Economic Development Corporation had restructured the allowable flights flying around New York and cut Liberty Helicopter's tour flights by 50 percent.
[113] Source: ARGUS email to the NTSB, dated Thursday, April 12, 2018 3:17 PM.

Attachment 15 – FAA Photos
Attachment 16 – NYONair CX Training Manual
Attachment 17 – Spidertracks Information
Attachment 18 – FAA InFO 18003
Attachment 19 – FAA Order 8900.457
Attachment 20 – FAA 8900.1 Reference
Attachment 21 –Airbus AS-350 VEMD Checklist
Attachment 22 – NYON Customer Service Pilot Training
Attachment 23 – Liberty/NYONair Pilot Safety Meeting Minutes
Attachment 24 – Liberty Training Manual (Extracts)

Submitted by:

_____

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