NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF AVIATION SAFETY
Arlington, Texas 76011

November 1, 2008

Operations Group Chairman Factual Report

DEN08MA116A/B

A. Accident

Location: Flagstaff, Arizona
Date/Time: June 29, 2008 1547 MST
Aircraft A: N407GA, Bell 407
Aircraft B: N407MJ, Bell 407

B. Operations Group

Chairman: Leah D. Yeager
National Transportation Safety Board
Central Region-Arlington, TX

Member: Evan Byrne
National Transportation Safety Board
Washington DC

Member: Thomas J. Latson
National Transportation Safety Board
Central Region-Arlington, TX

Member: David Keenan
Federal Aviation Administration AAI-100
Washington DC

Member: Scott Tyrrell
Federal Aviation Administration-Rotorcraft Directorate
Fort Worth, Texas

Member: Dennis McCall
Air Methods Corporation
Englewood, Colorado

Member: Scott Olson
Classic Helicopters Limited, LC
Page, Arizona

Member: Al Duquette
Professional Helicopter Pilots Association
Jasper, Texas

C. Summary

On June 29, 2008, at 1547 mountain standard time, a Bell 407 emergency medical service (EMS) helicopter, N407GA, and a Bell 407 EMS helicopter, N407MJ, collided in mid air while approaching the Flagstaff Medical Center (FMC) helipad (3AZ0), Flagstaff, Arizona. Both helicopters were destroyed. N407GA's commercial pilot, flight nurse, and patient sustained fatal injuries; and N407MJ's commercial pilot, flight paramedic, flight nurse, and patient sustained fatal injuries. N407GA was operated by Air Methods Corporation[1], Englewood, Colorado, and registered to Flagstaff Medical Center (FMC), Flagstaff, Arizona. N407MJ was operated by Classic Helicopter Services[2], Page, Arizona, and registered to M&J Leisure, L.L.C., Ogden, Utah. Visual meteorological conditions prevailed, and company flight plans were filed for the Title 14 Code of Federal Regulations Part 135 air medical flights. N407GA's flight departed FLG, at 1544, and N407MJ's flight departed the Grand Canyon National Park Service South Rim helibase, Tusayan, Arizona, at 1517.

D. Details of the Investigation

The National Transportation Safety Board (NTSB) was notified of the accident on June 29, 2008.

The Operations Group was formed on June 30, 2008, and began gathering reference manuals, witness statements, and pertinent documents from Air Methods, Classic, the Federal Aviation Administration (FAA), and FMC.

On June 30, 2008, investigators conducted an interview with the flight nurse, who was working onboard N407GA. He had been dropped off at Flagstaff Pulliam Airport (FLG) approximately 4-5 minutes before the accident due to excessive weight, which he stated would have affected the helicopter's hover out of ground effect flight performance.

On July 1, 2008, the Operations Group traveled to the FLG Air Traffic Control Tower (ATCT) and interviewed the Air Traffic Control (ATC) Manager and the controller, who was on duty at the time of the accident. An FAA Air Traffic Safety Inspector and the Manager of Air Traffic Investigations based at FAA Headquarters in Washington DC also participated with the group and coordinated the preparation of a certified copy of audio recordings between N407GA and ATC, and a partial ATC transcript.

[1] For the purpose of this report Air Methods Corporation will be denoted as Air Methods
[2] For the purpose of the report Classic Helicopter Service will be denoted as Classic

The Operations Group visited Air Methods' base of operations and Guardian Control located at FLG. Guardian Control controls all communications into and out of the FMC helipad. The Operations Group met with several members of the staff including the Program Director, and Director of Regional Operations. The group then toured the communications area, maintenance facility and hangar. A company Bell 407 was in the hangar and the group examined the exterior and interior to gain knowledge about the accident helicopter's EMS configuration.

The Operations Group then traveled to FMC and met with the Vice President of Business Development, Director of Security, and the Supervisor of Security. The group toured the Emergency Department (ED) and was briefed by ED staff on how communications are handled between emergency medical service (EMS) crews and the hospital. The group then toured the heliport, and took GPS coordinates for the security camera that captured the accident sequence, and the center of the main helipad. The height of the camera above the parking garage floor was also measured.

The group then reviewed the hospital's security camera surveillance video.

On July 2, 2008, a representative of the Professional Helicopter Pilots Association (PHPA) joined the Operations Group.

On July 2, 2008, the Operations Group split into two teams. Tom Latson, Scott Tyrrell, and Scott Olson, traveled to Page, Arizona, where they interviewed a medical crew, and the dispatcher on duty at the time of the accident. They also toured the Classic Control, the hangar/maintenance facility, and gathered requested materials.

Leah Yeager, Dennis McCall and Dave Keenan, along with the NTSB Investigator-in-Charge (IIC) Aaron Sauer, interviewed the Guardian Control Program Director and the transport coordinator, who was on duty at the time of the accident. Later that day, the Regional Aviation Director for Air Methods took four members of the Operations Group, as well as Dr. Paul Schuda, Director of the NTSB Training Center, and Aaron Sauer on a flight in an Air Methods Bell 407.

On July 3-5, 2008, the Operations Group reviewed the audio recordings for Classic's communications center and Guardian Control, and also the transmissions between both medical crews and FMC staff. Transcripts were made from the operator's audio recordings; however, the medical crew transmissions were not transcribed at that time. In addition, pilot and medical crew records, operational specifications, and company records were reviewed.

On July 4, 2008, Tom Latson and Aaron Sauer traveled to Classic's facility in Page, Arizona, to re-interview the dispatcher, who was on-call at the time of the accident.

The Operations Group completed their field notes on July 5, 2008, and the group was dismissed.

E. History of Flight

Audio recordings were obtained from Classic's communications center (Classic Control), Guardian Control, FMC, and FLG ATCT. The recordings were reviewed, transcribed, and merged into a single transcript.

At 1516, the Air Methods helicopter, N407GA, call sign Angel 1, contacted Guardian Control via aircraft radios and reported that they were departing Winslow, Arizona, with four people on board (the pilot, the two flight nurses and the patient). The pilot stated that his estimated time en route was 25 minutes and he was either going to land at FLG or at FMC. He was not sure if he would be at the proper weight to land with enough power to execute a safe out of ground effect hover at FMC with all four occupants onboard.

At 1517, the pilot of Angel 1 contacted Guardian Control via onboard radios and requested the current weather conditions at FLG. The on-call transportation coordinator provided the requested information and within two minutes she contacted FMC and told them that Angel 1 was inbound to the helipad in approximately 23 minutes.

At 1517, the pilot for Classic, N407MJ, call sign Lifeguard 2, contacted their communications center via onboard radios and reported that they had departed the south rim of the Grand Canyon and were en route to the FMC with an estimated time of arrival of 32 minutes. There were four people on board; the pilot, the flight nurse, the flight paramedic, and the patient.

Approximately one minute later, the pilot on Angel 1 called Guardian Control via onboard radios and reported that they were going to "drop one" at FLG before proceeding to FMC.

At 1523, the dispatcher on duty at Classic Control contacted Guardian Control via landline and reported that Lifeguard 2 was en route to the FMC and would be arriving from the north. He also reported that it would be a "cold drop"[3] and the emergency department at the hospital has already been notified. The Guardian Control transportation coordinator then informed the Classic dispatcher that Angel 1 was also en route and would be landing at FMC in 20 minutes. The Classic dispatcher then stated, "Ohh okay, I'll let them know when I talk to them next and I'll tell them to be sure and get a hold of you."

At the end of this call, the transportation coordinator for Guardian Control called FMC via land-line and stated that Lifeguard 2 would also be landing at the hospital in "about 28 minutes…and they know about mine coming in." The person who answered the landline in the emergency department (ED) responded, "All right." The transportation coordinator then contacted the pilot of Angel 1 via onboard radio and informed him that Lifeguard 2 would also be landing at FMC in approximately 28 minutes. The pilot responded, "Roger will be looking for 'em thanks."

[3]A cold drop is when an EMS crew lands on the helipad and shuts down the helicopter before unloading the patient.

At 1532, the pilot of Lifeguard 2 contacted Classic Control via onboard radios, provided a position report and said they were 15 minutes from landing at FMC. The dispatcher on duty responded, "Comm center copies all sir…I'll talk to you on the ground in 15 minutes 1532." This was the last recorded communication from the pilot.

Also at 1532, the pilot on Angel 1 contacted Guardian Control via onboard radios and reported that they were 10 minutes from landing at FLG.

At 1534 the pilot on Angel 1 called Guardian Control via onboard radios and asked the transportation coordinator to contact FMC and request additional ground support to assist in moving the patient onboard the helicopter. The coordinator then contacted the hospital and made the request.

At 1541, the pilot for Angel 1 contacted the FLG ATCT via onboard radios and reported that he was one mile out. A controller provided traffic advisories and cleared Angel 1 to land.

At 1543, the pilot for Angel 1 contacted the FLG ATCT via onboard radios and said, "…Angel 1 would like to depart to the north to the hospital with foxtrot." A controller responded, "Lifeguard Angel 1 wind variable at five taxiway alpha cleared for take off northbound to the hospital approved."

At 1544, the pilot for Angel 1 contacted Guardian Control via onboard radios and stated, "Control Angel 1 if you haven't figured it out we've uh landed at the…airport departed and we're about two minutes out of the hospital." The transportation coordinator responded and copied the transmission.

At 1550, the Classic dispatcher contacted Guardian Control via landline and asked the transportation coordinator if she had had any contact with "my ship." The transportation coordinator said, "negative."

A review of the recorded transmissions made between both medical crews and the hospital revealed that both of the medical crews contacted the FMC ED and provided medical reports on their respective patients.

A Classic medical crewmember contacted FMC via an onboard cellular phone at 15:25:53. The conversation ended 15:28:21, at which time the crewmember reported an estimated arrival time of 18 minutes (ETA 1546).

The Air Methods medical crewmember contacted FMC via onboard radio (Med Channel 3/EMSCOMM at 15:32:41. The conversation ended at 15:34:05; at which time the crewmember provided an estimated time of arrival of 15 minutes (ETA 1549).

Each crewmember spoke with a different nurse and physician. A review of both transmissions indicated normal communications and that both patients were medically stable.

The hospital staff that received the phone calls from both aircraft did not provide any information/warning about the other helicopter that was also en route to the FMC. There is no requirement for FMC staff to provide arrival or departure information regarding other aircraft to medical flight crews. If any information is provided it is given as a courtesy only.

A surveillance camera, mounted on a parking garage at FMC, captured the collision on digital video. The video depicted one helicopter approaching from north and one helicopter approaching from the south, and shows both aircraft descending after the collision. The NTSB Vehicle Recorders Laboratory, Washington, DC, examined the video.

N407GA was equipped with a GPS based outer-link tracking system that recorded position every 30 seconds. A review of the data revealed that N407GA flew in a straight line from FLG to the location of the accident site, about ¼-mile east of the FMC helipad. The data indicated that he had not initiated a turn onto final when the data ended.

N407MJ was equipped with a GPS based Sky Router tracking system, which recorded position every 5 minutes. A review of the data revealed that the last recorded position was approximately 10 miles northwest of the helipad. In addition, a Garmin 496 handheld global positioning unit (GPS) was located in the wreckage. The unit was shipped to the Vehicle Recorders Division at NTSB Headquarters, Washington, DC where it was downloaded on June 30, 2008. Examination of the unit revealed that it was not programmed to record the helicopter's flight track and there was no usable stored data for the accident flight.

No FAA radar services were available for the airspace surrounding FMC.

Several people witnessed the collision and reported seeing both helicopters descending into wooded terrain about ¼-mile east from the heliport. There was a small fire noted rising from the hilly terrain, followed by a loud explosion about 10 minutes after the collision.

1.1 Injuries Crew Passengers Total

Injuries to Persons - Air Methods, N407GA
Pilot: Fatal
Flight Nurse: Fatal
Patient: Fatal

Injuries to Persons - Classic, N407MJ
Pilot: Fatal
Flight Nurse: Fatal
Flight Paramedic: Fatal
Patient: Fatal

1.2 Flight Crew Information –Classic

At the time of the accident, Classic's training department operated under a FAA approved Part 135 training program.

The flight crew consisted of the pilot.

Pilot: Thomas C. Caldwell

The pilot, age 55, held a commercial pilot certificate for airplane single engine land and rotorcraft-helicopter, and an instrument rating for both airplane and helicopter.

His most recent second-class medical certificate was issued on March 4, 2008, and contained the limitation that he must wear corrective lenses for near vision.

He began his shift June 23, 2008 and was scheduled to end his 7-day shift on June 30, 2008. His normal duty hours were 12-hour shifts that started at 0700 and ended 1900, Monday thru Sunday.

A review of the pilot's Pilot Information Record provided by the operator revealed that he had accrued a total of approximately 14,500 hours; of which, approximately 9,780 hours were in helicopters. A review of the pilot's last Flight Training and Qualification Record revealed that on May 31, 2008, he had completed a recurrent Federal Aviation Regulation (FAR) Part 135 check ride in a Bell 407 with an FAA designated Check Airmen, who was the operator's Chief Pilot. At that time, the pilot reported a total of 841.1 hours as pilot-in-command (PIC) in the Bell 407; 251.1 hours in the last 12 months, 88.9 hours in the last 6 months, and 46.6 hours in the last 30 days. All of this flight time was accrued in the Bell 407.

As part of the recurrent Part 135 check ride examination, the pilot was tested on and satisfactorily completed the following segments: Basic indoctrination, general emergency, hands-on drill, aircraft ground, aircraft ground, flight, hazardous materials, FAA Part 135.293 and .299 qualification (initial and recurrent pilot testing requirements / PIC), and wind shear training.

Classic hired the pilot on May 7, 2007, as a full-time EMS pilot based in Page, Arizona. He satisfactorily completed Part 135 requalification training per the company-training manual with an FAA designated check airman, who was the operator's Chief Pilot.

As part of the requalification Part 135 check ride examination, the pilot was tested on and satisfactorily completed the following segments: Basic indoctrination, general emergency, hands-on drill, aircraft ground, aircraft ground, flight, hazardous materials, FAA Part 135.293 and .299 qualification (initial and recurrent pilot testing requirements / PIC), and wind shear training.

According to the operator, he did not work as a pilot for any other operator at the time of the accident and only flew the Bell 407. However, he was qualified by the United States Department of the Interior to operate a Bell 407 for the following operations: sling operations 50-feet and below, fire suppression/helitack, snow operations (deep snow), reconnaissance/surveillance, and mountain flying. This approval expired on December 31, 2008.

The pilot had been previously employed as an EMS pilot for Classic between 1998-2005, in Page, Arizona. At that time, he flew a Bell 206L and 407. During his tenure at Classic, he served as the EMS Safety Officer and was night vision goggle (NVG) qualified.

Between 2005 and 2007, the pilot flew an Agusta A119 as an EMS pilot for TriState CareFlight in Bullhead City, Arizona. He was NVG qualified and served as Safety and Training Manager. In addition, he had graduated from the Helicopter Association International (HAI) Safety Management Course.

The pilot had extensive flight experience operating in the Grand Canyon as a helicopter pilot. He also served on active duty in the US Army and in the US Army Reserves as a UH1 pilot and OH58A instructor.

A search of the National Driver Register found no record of driver's license suspension or revocation.

Pilot 72-Hour History and Background

On July 14, 2008, NTSB investigators submitted written questions to Mr. Caldwell's wife to obtain 72-hour history and background information about the pilot. On July 24, 2008, Mrs. Caldwell submitted answers to these questions. This following is a summary of the information she provided.

Mrs. Caldwell had known Mr. Caldwell since September 1997. She last spoke with him about 2 hours before the accident. He sounded relaxed and was looking forward to dinner at home.

Mr. Caldwell usually spent his off-duty time gardening, tinkering in the garage and in the boat, and watching news on TV. He liked to spend time with his family, friends, and hobbies. His hobbies included recreational fixed-wing flying. He was also involved in underwater recovery piloting an ROV for the National Park Service, boating, and autos. He normally went to bed about 2030 and awoke between 0430 and 0500. He would typically get between 6 and 8 hours of sleep. Mrs. Caldwell described the quality of his sleep as good. She described him as a morning person. She stated he had no particular difficulties with sleep or factors that would interrupt his sleep. He would occasionally take naps during the day.

She stated that on Sunday June 29, 2008, Mr. Caldwell awoke sometime after 0500 and did activities around the house to get ready for work. The commute from home to the

helicopter was about 3 minutes. She said he would have conducted a preflight on the helicopter about 0615. She said he usually would plan meals in advance according to his shift and would usually have a supply of healthy snacks on hand. She said the morning of the accident she had left town before 0500.

On June 23, 2008, Mr. Caldwell surprised a home invader and was injured in the altercation. He was examined in the ER and had suffered an injury to his ribs. His doctor released him back to work two days after the incident.

Mr. Caldwell normally worked seven days on and seven days off. She said he used the seven days off routine as a substitute for formal vacation time.

Mrs. Caldwell described Mr. Caldwell's health as good. Other than the event on June 23, 2008, he had no changes in his health in the last year. He took ibuprofen when needed and also took nutritional supplements. She said he took medications in the days before the accident. He got exercise through his daily activities that included gardening and home maintenance. He used reading glasses but did not wear them all the time. Mrs. Caldwell described his hearing as average. He would occasionally have a beer or margarita when dining out and last had alcohol on June 25, 2008. He would drink coffee in the morning and have iced tea sometimes later in the day.

She said there were no remarkable changes in his personal life over the last year and no significant changes in their financial situation over the last year.

Mr. Caldwell got into flying through the Army. He had attended trade school before that. During his Army service he received the National Defense Service Medal, the Good Conduct Medal, and the Armed Forces Expeditionary Medal (Korea).

Mr. Caldwell enjoyed working with the people at Classic. Matt Stein, the Chief Pilot, knew him best at the company. Mr. Caldwell did not have concerns about flying for Classic. He was paid bi-weekly. He had turned down a flight in the past. His long term plans included recreational flying and retirement.

She had no knowledge of any previous accidents or incidents or disciplinary action involving Mr. Caldwell. She stated that he did get a speeding ticket while driving in the past.

Mrs. Caldwell stated that the people who knew him considered him to be highly proficient, knowledgeable, skillful, and safe.

Flight Nurse - James W. Taylor

Age: 36

Mr. Taylor was employed as a registered nurse (RN) with Intermountain Health Care and as a Flight Nurse with Classic. He was also a member of the US Army Reserve as a Combat Medic Instructor.

Mr. Taylor began employment with Classic on April 27, 2007. The RN/CEP Orientation included the following topics: Orientation to the Company and Overview of Policies and Procedures; Introduction to Classic Lifeguard Aeromedical Services Inc., Overview of all Policies and Procedures; required documentation; Crew Quarters; Flight Physiology; Crew Resource Management; Aviation Safety and Personal Survival; Communications; Communication Center; Documentation in Flight Record; Drugs; Equipment Lab: Demonstration and Return Demonstration; restocking Aircraft; Fueling Procedures; Oxygen Systems; Night Vision Goggle Training; ANVIS Operations; Flight Proficiency and Resources for Flight Nurses and Medics. Training was completed on May 25, 2008.

He attended the Classic's Spring Conference on May 02 - 04, 2008.

Duty History

A typical shift for Classic's medical crew consisted of a three-day/72-hour shift. James Taylor was on the last day of a back-to-back three-day shift (total of 6 days on duty), which had started on June 24, 2008.

Flight Paramedic - Tom Clausing

Age: 42

Mr. Clausing was a Paramedic/ Ranger with Grand Canyon National Park as well as hiring on with Classic as a Flight Paramedic. He was also a member of the US Army Reserve as a Combat Medic Instructor and certified as an EMT-Paramedic within the State of Arizona with an expiration of June 15, 2009.

He completed Classic RN/CEP Orientation on June 2007 which included the following topics: Orientation to the Company and Overview of Policies and Procedures; Introduction to Classic Lifeguard Aero-medical Services Inc, Overview of all Policies and Procedures; required documentation; Crew Quarters; Flight Physiology; Crew Resource Management; Aviation Safety and Personal Survival; Communications; Communication Center; Documentation in Flight Record; Drugs; Equipment Lab: Demonstration and Return Demonstration; restocking Aircraft; Fueling Procedures; Oxygen Systems. Mr. Clausing completed the Initial Night Vision Goggle Ground and Flight training course on June 2007.

He attended the Classic's Spring Conference on May 02 - 04, 2008.

Duty History

A typical shift for Classic's medical crew consisted of a three-day/72-hour shift. Tom Clausing was on the last day of a back-to-back three-day shift (total of 6 days on duty), which had started on June 24, 2008.

1.3 Flight Crew Information –Air Methods

At the time of the accident, Air Methods' training department operated under a FAA approved Part 135 training program.

The flight crew consisted of the pilot.

Pilot: Patrick J. Graham

The pilot, Age 51, held a commercial pilot certificate for airplane single engine land and rotorcraft-helicopter, and an instrument rating for both airplane and helicopter.

His most recent first-class medical certificate was issued on September 12, 2007, and contained the single limitation of Cleared Class I with near vision restriction.

A review of the pilot's last Flight Training and Qualification Record revealed that his last Airman Competency/Proficiency Check was accomplished on August 15, 2007. At the time of the accident, the pilot had accrued a total of approximately 5,241 hours; of which, 4,500 hours were in helicopters.

In the previous three months, the pilot had accrued 150 hours; of which 53 hours were at night. The flight time during the last 30 days were 51 hours, of that 19 hours were night. All of this time was accrued in the Bell 407.

The pilot was hired on October 7, 2003, as a full-time EMS pilot at the operator's base in Flagstaff, Arizona. According to the operator, he did not work as a pilot for any other operator at the time of the accident. He flew only the Bell 407. At the timer he was hired with Air Methods, the pilot had accrued a total of approximately 4,353.6 hours; of which, 341.2 hours were as pilot-in-command (PIC) in the Bell 407.

During his tenure at Air Methods, he served as the Safety Officer and the Safety Coordinator, and was also NVG qualified.

Previous experience as reported on his application for employment for Air Methods:

The pilot had been previously employed as an EMS pilot for Metro Aviation in Shreveport, Louisiana from April 2002 to date of hire with Air Methods. At that time he reported a total of 3,970 hours, of which 1,273 hours were in the Bell 206 (TH-57). He did not report having any Bell 407 flight time.

Between 2002 to time of hire with Air Methods, the pilot flew as an EMS Line pilot for Dartmouth-Hitchcock Advance Response Team (DHART), Lebanon, New Hampshire. This program consisted of a single engine aircraft EMS air and ground program serving five states in the Northeast. Aviation services were contracted through Metro Aviation Inc.

From March 2000 – February 2002, the pilot managed and flew on the schedule for 6 – 10 EMS bases flying AS350 B2 and B3 helicopters. This included all aspects of operations and personnel management for as many as 45 pilots and mechanics.

The pilot retired from the US Navy in January 1997. While serving on active duty he flew SH-2F Seasprite aircraft flying Anti-Submarine Warfare missions.

A review of the pilot's Pilot Information Record revealed that he had attended and satisfactorily completed all company initial, recurrent, and NVG training courses.

A search of the National Driver Register found no record of driver's license suspension or revocation.

Pilot 72-hour History and Background

NTSB investigators performed a phone interview with Mr. Graham's wife on July 10, 2008. She provided the investigators the following information:

Mrs. Graham had been married to Patrick Graham for 25 years and they had known each other for about 32 years. She last spoke to him the afternoon of the accident when she called him at work. It was a routine conversation and she characterized him as sounding normal.

Mr. Graham was working the day shift before the accident. She said that meant he leaves home about 0815 and if it is a normal schedule he gets off about 2100. He usually got home between 2130 or 2145. She said he would always drive straight home after a shift. She said he followed that schedule on Saturday June 28, 2008, and the previous days on shift. She characterized Mr. Graham's schedule as regimented – he always followed the same routine and did the same things at home. He would typically wake up about 0630-0700, and jog for about a half hour every other day, or every couple of days, and then after jogging would feed the wild birds, water the garden, get dressed for work, and then have breakfast before leaving the house to drive to the base. The drive to the base took about 20 minutes. She did not know whether he jogged on Saturday or Sunday but his running gear was hanging up where he usually put it to dry on Sunday. He normally went to bed about 2200. He never took naps during the day when working day shift.

On the morning of the accident she described him as appearing rested and in good spirits as they said goodbye before he drove to work.

She said he started his schedule either on Tuesday the 24th or Monday the 23rd – she couldn't remember whether the start day of the schedule had been modified because the base had just started a 3 pilot rotation because the 4th pilot had gone to California.

He would take food with him to work for both lunch and dinner and snacks during the day.

Mrs. Graham said there were no stressful events going on in his life about the time of the accident. She said earlier in June they had a great family reunion during which time they were able to celebrate her mother's 75th birthday. He took 3 days vacation during that time in addition to his normal time off from work when he was not on shift.

She said flying always came naturally to him. He liked the EMS mission. Before coming to Air Methods he was working in New Hampshire, and they had lived in many parts of the country during his time as a helicopter pilot in the Navy. They had spent about a year in New Hampshire but both of them enjoyed the western states as they had gone to school in Colorado. He saw the position in Flagstaff and they decided to go for it. She said Mr. Graham loved Air Methods and thought the company was wonderful. He loved his job being in the emergency field and helping others.

Mrs. Graham said they didn't socialize with others in the company beyond getting together with the group once a year.

Mr. Graham did not do any flying outside of work nor did he have a job outside of Air Methods. When not flying for Air Methods, he loved snow skiing and woodworking. He enjoyed fixing up the homes they lived in and remodeling. He also enjoyed mountain biking and hiking. They did not have children but they had animals including two dogs and horses.

She was not aware of any specific commendations he received at work, however mentioned that she knew he was thought of highly by those he worked with and was also the safety officer. She said safety was his middle name. He took the job seriously. She said never in a million years would he take a flight or do anything to compromise safety. She described him as a fun loving individual but very serious when it came to flying. She said described him as a nice neighbor who helped others out in the community – a generous man.

She said he never had a car accident and did not think he had ever had an accident or incident in aviation.

There were no changes in Mr. Graham's personal life in the last year, and she said they were going good financially and their financial situation had been stable.

She said his health was good in the days before the accident. Mr. Graham did not take any medications and was not being treated for any medical conditions.

Mr. Graham was a nonsmoker. She described him as a social drinker when he was off duty and not doing a shift rotation – only a one or two beer a night kind of guy. He took an iced coffee with him every day to work, and also drank water.

She said Mr. Graham did not have any difficulty sleeping and had no sleep disorders.

His vision and hearing was described as fine. He did not use reading glasses to read around the house – but would use her drug store reading glasses if he was picking out a splinter or something like that.

Mrs. Graham said that Mr. Graham was fond of everyone at Air Methods. He rarely said a negative thing about anyone – period. She said he was impressed with the quality of people he worked with – he spoke highly of them. She said if Mr. Graham had any safety concerns at Air Methods he would have told someone and gotten them addressed – that was his way of doing things.

She said Mr. Graham was aware of pressure in the EMS industry – that it can be a problem. However he as a person would never take a flight if he didn't think it was safe or OK to take.

He would never succumb to pressure she said. She knew that weather was one reason that they had to turn down flights.

She was asked about overtime and extra hours and said it was not a routine practice. It would occur when they changed pilots periodically and would go to a different rotation to make up for the missing pilot while they got another. Instead of a 7 and 7 it may turn to 6 and 3 or something like that. The shifts did not affect him she said. He was always just himself.

Flight Nurse - Jason Selman

Age 33

On June 30, 2008, NTSB investigators interviewed Jason Selman, who was employed as a Flight Nurse by Northern Arizona Healthcare. He was a medical crewmember onboard N407GA on the day of the accident.

Mr. Selman had been employed with Northern Arizona Healthcare for four years, and was authorized for medical flights on fixed-wing aircraft and helicopters. In the summer months, he normally worked onboard the helicopters due to the fact that he has a low body weight. Mr. Selman stated that he was trained as a neo-natal nurse in the Army and he was considered a neo natal specialist.

Mr. Selman stated that he worked a 48-hour shift that started at 0800 and ended 48-hours later at 0800. He came on duty after 4 days rest at 0800 on the day of the accident. At the time of the accident he had been on duty approximately 7 hours and 44 minutes.

Mr. Selman stated that the captain came on duty at 0900. Prior to any flights that day, he had a conversation with the captain, and the other flight nurse about a recent EMS accident that had occurred two days prior. They discussed what may have happened on that flight and how important it was to be safe since "they all wanted to go home at the end of their shift."

Mr. Selman stated that he always flew with another flight nurse, who specialized in adult care. He had flown often with the captain and other flight nurse, and described his relationship with them as "excellent." They communicated well and the pilot was always open to medical crew input. There was no ego.

The crew's first flight occurred around 1030 from Flagstaff to Cottonwood, Arizona for an infant pick-up. Upon their return they stopped at Flagstaff and dropped off the flight nurse that specialized in adult care due to weight restrictions. The flight then continued to FMC, where the helicopter landed without incident. The flight nurse that was dropped off drove to FMC and met the crew. The captain stayed at FMC, cleaned the helicopter, and then flew back to Flagstaff. The two flight nurses drove back to Flagstaff with the infant isolette.

Once the crew was back at FLG, they had an approximately 1.5 hour break before the second call. The crew was dispatched to Winslow, Arizona for an adult patient pick-up. Mr. Selman said the patient weighed approximately 260 pounds and there would most likely be a weight restriction (about 100 pounds) on the return flight and that he would be dropped FLG. Approximately five minutes after they departed Winslow, he heard the pilot contact Guardian Control and reported they were about 20 minutes from FLG. He also heard Guardian Control report that Classic was inbound to FMC and had an ETA of 28 minutes.

About 15 minutes later, Mr. Selman heard the pilot report that he was 15 minutes out and would be landing at FLG to drop him off.

Mr. Selman stated that the medical crew is tuned into the pilot communications, and he did not hear any further communications from Classic. In addition, he did not hear the Air Methods pilot discuss the Classic flight after the initial notification. The entire crew is trained to practice a "sterile cockpit" during takeoff and once the approach to land is established unless there is an emergency. Only the pilot talks to Guardian Control and ATC. The medical crews only communicate on the medical radios to respective emergency departments and relay patient information.

Mr. Selman reported that he had noticed several helicopters operating in and around the FMC heliport. If there were multiple aircraft in the area, they will have to hold, then approach and do a "hot drop."[4] He described it as "musical chairs."

[4] A hot drop is when an EMS helicopter lands on the helipad and unloads the patient while the engine/rotor is operating.

The medical crew is trained to be an extra set of eyes if the patient is stabilized. Mr. Selman said he would visually clear the left side of the helicopter for the pilot on each flight.

Mr. Selman felt that this accident was a result of a lack of communications between the two operators. He also stated that it is rare for two pilots to talk air-to-air.

Flight Nurse - Shawn Shreeve

Started with FMC on June 26, 1995, as an EMT with Guardian Medical Transport.

- On October 04, 1998 he was promoted to a Certified Emergency Paramedic with GMT.
- On May 12 2003, he transferred to Guardian Air as a Flight Paramedic.
- On January 05, 2004 he transferred to the RN Grad Program.
- On June 21, 2004, He completed the RN Critical Care Program and continued working in CCU as an RN.
- On June 20, 2005, he transferred back to GAT as a Flight Paramedic.
- On March 27, 2006, he became a Flight RN.

Basic Indoctrination Ground Training was completed on December 04, 2007. The training included the following modules: Operator Specific, Medical Personnel Specific, General Aircraft, Emergency Situation Training, Emergency Drill Training (Annex 29,30 & 31, Hazardous Materials – Will Not Carry.

NVG Initial Qualification Training Modules were completed on December 04, 2007. Modules consisted of Operator Specific, Airman Specific Training, and Aircraft Ground Training. The Aircraft Flight Training Modules were completed on January 31, 2008.

According to Air Methods, his duty time between June 15 and June 28, 2008 consisted of the following dates:

Sunday, June 15 & 16 - Kingman Base
Thursday, June 26 - Kingman Base

He worked a 48-hour shift that started at 0800 and ended 48-hours later at 0800. He came on duty after 4 days rest at 0800 on the day of the accident.

1.4 FMC Heliport

Heliport Dimensions

The FMC heliport is a “private use hospital heliport.” The helipad is located atop the emergency department roof on the southeast corner of the hospital campus and was designed in compliance with FAA Advisory Circular (AC) 150/5390-2A, Heliport Design. The helipad

is 40-foot-wide and 80-feet-long and is constructed of corrugated aluminum matting, which is heated to prevent ice accumulation. A tricolor green/amber/white beacon serves to identify FMC and has an illuminated windsock for wind information. A closed circuit monitoring system that is activated with a motion-sensor was installed at the vestibule entrance into the hospital from the pad. At the time of the accident, the camera was operational but did not capture the accident sequence. However, another motion-sensor security camera was installed on the top of a hospital-parking garage located approximately 50 yards from the helipad. The camera faced a general direction of 070 degrees and was mounted on a concrete-based fixture and affixed to a metal pole about 10 feet high. Prior to the accident, a hospital guest activated the camera and it captured the collision of the two helicopters.

The southern half of the pad, identified with an "H" and amber perimeter lights, is the designated take off and landing area. The northern half of the pad is for helicopter parking only.

There are no aircraft services available at FMC helipad.

Published Procedures/Communications

In order to facilitate operations and communications between EMS operators and FMC, the hospital implemented Guidelines of Practice (HP 700-02) regarding FMS Helipad Operations. These guidelines were implemented on October 18, 1999, and include helipad characteristics, communications, arrival/departure procedures, safety, reporting of violations, and potential consequences of repeat violations.

According to these procedures, helicopters operating at FMC are advised to establish communications with Guardian Control at the earliest opportunity. Guardian Control can be contacted on the following frequencies: 152.285 PL14 (receive) 157.545 PL17 (transmit).

It is required that all inbound aircraft will notify Guardian Control at the earliest convenience, but not less than a minimum of five (5) miles out.

The procedures stated, "Timely communication with Guardian Air Control is especially paramount when multiple helicopters are inbound to the facility."

When these frequencies are programmed into the VHF radios it allows for both monitoring and transmitting either air-to-ground or air-to-air communications. EMS pilots can also monitor the Flagstaff Airport tower frequency (134.55) for potential traffic in the area.

In addition to the standard aviation navigation/communication radios and the VHF radio used to communicate with Guardian Control, there is another UHF radio frequency (Med Channel), which is used for the aircraft to communicate with the ED. These frequencies are 463.050 to receive and 468.050 to transmit. This radio is commonly referred to as

EMSCOM (EMS Communication) and is used to transmit patient status and information along with estimated arrival times to the hospital.

Guardian Control monitors four repeaters; Mount Elden, Mingus Mountain, Haden and on the Colorado River. There are lights on the transportation coordinator's radio numbered F1 thru F4. When a transmission is received, the light corresponding to the repeater used for the transmission will illuminate.

Guardian Control is broadcasted/received via the Elden Repeater located 5 miles northeast of FMC. According to Classic, mountain peaks block the signal when they approach from the northwest. However, they are able to receive the signal once they are within 10 miles of the heliport. During the time they cannot receive the Elden repeater, they will use an onboard cellular phone. However, they still have enough time and distance (about 10 miles) to contact Guardian Control via onboard radios prior to landing.

Guardian Control does not have the ability to shut down or deselect a repeater, which are maintained by FMC. According to Guardian Control, there was no maintenance performed on the repeaters on the day of the accident and there were no reported communication problems.

Arrival and Departure Procedures

Helicopters operating at FMC are encouraged to follow the noise abatement guidelines depicted in the heliport's Guidelines of Practice. Arrivals/departures from the east are advised to use Switzer Mesa as an initial point while flights from the west are advised to use Basha's Plaza. Operators are asked to avoid noise abatement areas whenever possible and are advised to maintain an altitude of 8,000 feet msl when flying over the city of Flagstaff. All approaches and arrivals into the heliport are made to the southern pad, designated by the "H." Due to the singular landing area, there are no simultaneous operations conducted on the FMC helipad. If two helicopters arrive in close proximity, the first will land to the "H", then slide to the parking area before the second helicopter lands on the "H." An alternative would be for the first helicopter to hot-drop their patient, then reposition to FLG, thereby clearing the helipad for the other arriving helicopter.

The procedures stated that when an operator is ready to depart the heliport, the pilot would contact Guardian Control. All departures commence at the "H."

Disciplinary Actions

According to FMC's Guidelines of Practice, any violations of safety practices and/or the published procedures will be reported to the FMC Director of Security/Safety. The Director will then follow-up with the operator and "seek compliance for the reported violations."

In an interview, FMC's Director of Safety/Security stated there were currently six operators authorized to operate from the FMC heliport. He said that there had not been any violations

of the Guidelines of Practice. However, had there been, he would talk to the operator directly. He reported that FMC did not have any on-going disciplinary problems with any operator at the time of the accident.

In an interview with the Director of FMC's ED, she stated that of the six operators (Classic, Air Methods, Inc., Native Air, Air Evac, Arizona Department of Public Service, and the National Park Service, the only operator that was not consistently notifying the ED of their arrival was Native Air (Omni Flight). The Director stated that she was in the process of gathering a list of policy violations and no disciplinary action has been taken.

Safety Committee Meetings

The Director of Safety/Security stated that he used to coordinate annual Safety Committee meetings with all of the helicopter operators, but he had a "problem getting all the vendors together." He had no held a meeting in "a while" and could not recall when the last meeting had been conducted.

The Director reviewed FMC's Safety Meeting records, which revealed that the last Safety Committee meeting was in July 2004. According to the meeting notes only one of the operators attended. As a result, the following statement was placed in the Meeting Notes, "It has been determined that when a helicopter vendor has been reasonably notified about helipad safety meetings and does not send representation; the vendor is stating there are no safety issues they need to have addressed and are accepting the committee's actions. All vendors have been given committee contact information and are encouraged to use it if they are unable to have a representative at the meetings."

The Director also stated that FMC's Guidelines of Practice are revised every three years per hospital policy or if there is a need to revise the procedures. The last revision was completed on September 11, 2007. He stated that he mailed and faxed the revised procedures to each operator.

1.5 Flagstaff Pulliam Airport, Flagstaff, Arizona (KFLG)

The public airport is located approximately 4.61 miles southwest of downtown Flagstaff, Arizona, and approximately 5.3 nautical miles south of the FMC helipad. The airport sits at an elevation of 7,015 feet mean sea level (msl). The paved runway (03/21) is 8,800-feet-long and 150-feet-wide. The airport operates a FAA contracted air traffic control tower during the following hours:

June 1st to September 31st between 0600 and 2100
October 1st to May 31st between 0700 and 1900

According to the air traffic control tower manager, there are five full-time controllers on staff each with over 30 years of experience. The tower works approximately 20-30 helicopter operations a day; of which, a majority of those are EMS flights. The other

operations are local law enforcement, military, and some training flights. He described the tower's relationship with EMS operators as "great to work with", "no issues or problems", "professional", and "pretty sharp." The manager said that he had never heard of Classic prior to the accident, which he felt was due to the fact that Classic normally approaches FMC from the north and does not enter FLG Class D airspace.

The Class D airspace around FLG is six miles wide and has a service ceiling that extends from the surface up to 9,000 feet mean seal level (msl) or 2,500 feet above ground level. The Class D airspace does not include the airspace around FMC, which is about 1.5 miles from the edge of Class D airspace.

The manager of the tower reported that the controllers are unable to see FMC from the tower cab, and have difficulty seeing any aircraft if it is more than 1 to 1.5 miles from the airport control tower due to densely wooded and mountainous terrain surrounding the airport.

The Operations Group toured the tower cab and confirmed that the surrounding hilly terrain, which is covered with Ponderosa Pine, makes it difficult for controllers to visually spot aircraft. This was especially true if aircraft are painted a dark color. The group observed an EMS helicopter after it departed from FMC, and it was challenging to spot. The group noted that they had to look for the motion of the main rotor blades versus looking for the body of the helicopter itself.

According to an NTSB ATC Specialist, Class D airspace is no longer of a "standard" size and is only large enough to contain the operations at the towered airport it was established to protect.

The criteria for figuring out how big Class D airspace is supposed to be can be found in FAA order 7400.2, titled, "Procedures for Handling Airspace Matters."

1.6 Flight Observations

On July 2, 2008, Captain Chris Burns, who is the Regional Aviation Director for Air Methods, took four members of the Operations Group, as well as Dr. Paul Schuda, Director of the NTSB Training Center, and NTSB IIC Aaron Sauer, on a flight in an Air Methods Bell 407. The purpose of the flight was to observe the flight path from FLG to FMC, the visual cues that the pilot would use to approach FMC, and the visibility limitations for the medical crew and pilot. The flight originated at FLG.

Due to weight and balance restrictions, Captain Burns took only two observers at a time. Aaron Sauer and Leah Yeager flew together on the first flight, Dave Keenan and Paul Schuda on the second flight, and Dennis McCall and Al Duquette on the third flight.

Captain Burns said that he personally trains/flies with each new-hire pilot and demonstrates how to approach FMC from the north and the south. These procedures are not written in the pilot training manual, and are taught during a familiarization flight only.

Once airborne, Captain Burns executed the route/procedures that he trains his new-hire pilots to conduct when approaching the helipad from the south. Investigators noted that Captain Burns approached FMC much further east than what was observed on the surveillance video. Captain Burns stated that he flew to FMC at an altitude of 8,000 feet msl, at 85 knots. Then, as he turned onto final approach to the helipad (about ½-mile out), he descended to 7,500 feet msl and reduced approach speed to 65 knots. Once the helicopter was over the helipad, Captain Burns departed to the west and prepared to execute an approach from the north. Investigators asked Captain Burns to conduct another approach from the south, this time having him fly directly to the location of the accident site before turning on final approach. This approach was made further to the west and the base-to-final turn was approximately ¼-mile from the helipad. On this approach, Captain Burns said that his eyes had to be on the helipad much earlier in the approach, which meant he was looking to his left outside the helicopter versus looking forward outside the front of the helicopter.

1.7 Aircraft Information

The Bell Model 407 is a civil utility helicopter, a derivative of the Bell 206L-4 LongRanger. The 407 have a 4-bladed rotor system with a rigid, composite rotor hub instead of the Model 206's 2-bladed conventional rotor. The Bell 407 is frequently used for corporate and offshore transport, as an air ambulance, law enforcement, electronic newsgathering and movie making.

The Bell 407 features the four blade main rotor developed for the OH-58 (Model 406). The blades and hub use composite construction, have no life limits, and provide improved performance and better ride comfort.

The 407 are also 8 in (18 cm) wider, increasing internal cabin width and space, and features 35% larger main cabin windows. The more powerful Rolls-Royce (Allison) 250-C47 turbo shaft allows an increase in max takeoff weight and improves performance at hotter temperatures and/or higher altitudes.

General characteristics

- Crew: 1 pilot
- Capacity: Typical seating configuration for seven comprising pilot and passengers, with five passengers in main cabin.
- Length: 41 ft 8 in (12.7 m)
- Rotor diameter: 35 ft 0 in (10.67 m)
- Height: 11 ft 8 in (3.56 m)
- Disc area: 962 ft² (89 m²)
- Empty weight: 2668 lb (1210 kg)
- Useful load: 2347 lb (internal) (1065 kg (internal))

- Max takeoff weight: 6,000 lb (2,722 kg)
- Power plant: 1× Allison 250-C47 turbo shaft, 700 shp (520 kW)
- Propellers: 4 blade rotor

Performance

- Maximum speed: 140 knots (260 km/h)
- Cruise speed: 133 knots (152 mp/h, 246 km/h)
- Range: 330 mi, 379 nmi (612 km)
- Service ceiling 18,690 ft (5,698 m)

Maximum Gross Weight

Internal	5000 lb	2268 kg
External	6000 lb	2722 kg

Useful Load

Internal	2347 lb	1065 kg
Max External	2646 lb	1200 kg

Speed & Range

Max Cruise Speed	133 kn	246 km/h
Maximum Range	330 nm	612 km

(a) Air Methods-N407GA

The Guardian Air aircraft registration number N407GA was a Bell Helicopter Textron (BHT) 407 manufactured in 1993, Serial Number 53104 having 9,373.4 total airframe hours at the time of the accident.

A Rolls Royce Allison 250 C-47B Turbo-Shaft engine, serial number CAE847119 having 9112.8 total engine hours at the time of the accident, powered N407GA. N407GA had approximately 19,639 starts and 26,094 landings at the time of the accident.

N407GA was configured with a high skid gear for Emergency Medical Services and equipped with an Air Methods Corp. Emergency Medical Interior under

STC#SR00275DE dated January 09, 1996, installed May 05, 1998. Additionally it was equipped with an Air Methods Corp. Articulating Lightweight Loading System under AMC's STC SR00559DE, installed July 24, 2007.

ADDITIONAL EQUIPMENT

- REB Technologies NVG Cockpit Modification
  - STC#SR09423RC, installed 1/23/06
- Installed 7/24/07under AMC's Avionics Work Order 8864
  - KCS55 Compass System
  - KG102A Directional Gyro
  - KRA 405B Radar altimeter
  - CP2 Outerlink
  - KX165 #2 Communication System
- Pointer 3000 ELT Installed 4/15/1998

Classic Helicopters-N407MJ

Serial Number – 53079
Manufactured - 1996
TSN Airframe – 4540.3
Cycles (starts) – 7029
RIN (landings) – 10028

Configuration – N407MJ was configured for utility operations and emergency medical service operations. Medical equipment was a standard folding liter allowing for utilization of the left front seat by medical personnel when not transporting patients.

Aircraft was equipped with high skid gear and also fitted with a cargo hook for external load operations.

- Engine - Rolls Royce Allison 250 C-47B
  - TSN –
  - Inlet Barrier Filter System STC # SR09368RC (Aerospace Filtration Systems).

- Avionics
  - Bendix/King Nav/Comm Radio KX-165
  - Bendix/King Comm. Radio KY-196A
  - Air Comm. Audio Control Panel ACS300A
  - Bendix/King Transponder KT-71
  - Bendix/King GPS KLN-89
  - Technosonic TFM-500
  - Garmin GPS 496
  - Indicator VOR/LOC/GS KI-206
  - Comm. Antenna CI-122
  - Comm. Antenna DM C70-1/A
  - Nav. Antenna CI-259E

- Remote Mount ELT M-3000-10
- ELT Antenna DM Q18-1/A
- Avionics Cooling Fan FN200
- Incoding Altimeter 5035P
- Antennas TFM500/TRM138B/twoCI177-1
- Blue Sky Flight Following System D1000
- Aux FM System
- USFS 9 Pin System
- Radar Altimeter, Field Approved 10 Feb. 2005 Certificate # KBTR482F.

- Airframe Modifications
  - Tail Rotor Pedal Lockout Kit, P/N 206-928-200, per STC#SR00513AT (Aeronautical Accessories, Inc).
  - Bleed Air Cabin Heater, P/N 407H-102, per STC#SR00280DE (Paravion Technology, Inc.).
  - Wire Strike Protection Kit, P/N 965-37401-001, per STC# SR00975AT (Bristol Aerospace).
  - Pulse Light System, Model # 1220/2410-2, SN T01948, per STC#SA01489AT (Aeronautical Accessories, Inc.).
  - Locking Fuel Cap Kit, P/N 407-701-002, per STC#SR01489AT (Aeronautical Accessories, Inc.).
  - Cargo Hook Provisions Kit, P/N 206-706-341-123, Bell Helicopters and a cargo hook assembly, P/N 528-023-01, SN 387, per STC# SR00898SE (Onboard Systems)
  - Instrument Panel
  - Baggage Floor Protector STC#SH1147SO (Aeronautical Accessories.
  - Spacemaker STC#SH227WE (Aeronautical Accessories).
  - Cyclic Safety Cover STC#SH244WE (Aeronautical Accessories).
  - Hat Rack Safety Net STC# SR01600AT (Aeronautical Accessories).
  - Collective Safety Cover STC#SH2373SO (Aeronautical Accessories).
  - Medical Diagnostics Module STC#SR00275OE (Air Methods).
  - Super Night Scanner, STC#SH1312SO (Aeronautical Accessories).
  - Liter Kit, Field Approved 10 Feb. 2005 Certificate # KBTR482F.
  - Medical O2, Field Approved 10 Feb. 2005 Certificate # KBTR482F.
  - Tail Rotor Recognition Light, Field Approved 10 Feb. 2005 Certificate # KBTR482F.
  - EMS Power, Field Approved 10 Feb. 2005 Certificate # KBTR482F.
  - Alternate Lighting System, STC#SR09410RC (Control Products)
  - Snap Vent Window, Field Approved 16 May 2005 Certificate # IA547231290.

Color Scheme

N407GA (Air Methods) had a tri-color paint scheme: the main body was red, with dark blue, and titanium silver accents.

N407MJ (Classic) also had a tri-color paint scheme: the main body was concord blue, with metallic gold accents, and the belly was painted a cream color. The helicopter had been retouched with paint several times with a paint that was slightly "greener" than the concord blue. This may explain why several witnesses described the Classic helicopter as the "green" helicopter.

Bell 407 Interior Configurations

Classic Helicopter (N407MJ) (Patient On-Board)

<table>
<tr><td>Open
(fwd)</td><td>Pilot
(fwd</td></tr>
<tr><td rowspan="2">Stretcher</td><td>Nurse
(aft)</td></tr>
<tr><td>Medic
(fwd)</td></tr>
</table>

Classic Helicopter (N407MJ) (No Patient On-Board)

<table>
<tr><td>Medic
fwd</td><td>Pilot
fwd</td></tr>
<tr><td rowspan="2">Stretcher</td><td>Nurse
aft</td></tr>
<tr><td>Open
fwd</td></tr>
</table>

Air Methods (N407GA)

<table>
<tr><td rowspan="2">Stretcher</td><td>Pilot
fwd</td></tr>
<tr><td>Open
aft</td></tr>
<tr><td>Medic
fwd</td><td>Medic
fwd</td></tr>
</table>

1.8 Pre Landing Checklist Procedures

Air Methods

Air Methods uses FAA approved abbreviated checklist procedures (Revision 2 dated November 13, 2006) for the Bell 407. A review of the APPROACH checklist revealed that during the approach briefing the pilot is to turn on the Landing Lights.

Classic

Located in the wreckage of N407MJ was an 8-page bound and laminated checklist titled Classic Helicopters BHT 407 Checklist. A review of the DESCENT and LANDING checklist revealed that the pilot could turn on the landing light switch "AS DESIRED."

1.9 Company Information

(a) Operational Control

Air Methods

Air Methods is a Federal Aviation Regulations (FAR) Part 135 Air Carrier, which held on-demand operations specifications. Company headquarters are located in Englewood, Colorado. The CEO, Board of Directors, Chief Pilot, Director of Operations, Director of Maintenance, and the Director of Safety reside in Colorado.

N407GA was operated by Air Methods, Englewood, Colorado, and registered to Flagstaff Medical Center, Flagstaff, Arizona.

Air Methods was established in Colorado in 1982 and now serves as the largest provider of air medical emergency transport services and systems throughout the United States. It is a publicly traded company (AIRM). Air Methods operates a fleet of more than 342 helicopters and fixed-wing aircraft in 42 states. It currently employs nearly 1,100 pilots.

Air Methods Corporation and its subsidiaries provide air medical emergency transport services and systems in the United States. It operates in three segments: Community-Based System, Hospital-Based System, and Products.

The Community-Based System (CBS) segment provides air medical transportation services, which include medical care, aircraft operation and maintenance, communications and Control, and medical billing and collection services. As of December 31, 2007, this segment operated 135 helicopters and 4 fixed wing aircraft. Under the CBS delivery model, our employees provide medical care to patients en route

The Hospital-Based System (HBS) segment offers air medical transportation services and medically equipped helicopters and airplanes for hospitals. As of December 31, 2007, this segment operated 187 helicopters and 16 fixed wing aircraft. Under the HBS

delivery model, employees or contractors of Air Methods, the customer hospitals en route provide medical care.

The Air Methods operation based at Flagstaff was considered a HBS. Northern Arizona Healthcare, who owns/operates FMC, maintains the helipad, owns the aircraft, and employs the pilots, medical crews, and the transportation coordinators. This also includes all of the staff at Guardian Control and the maintenance facility based at FLG.

The Products segment involves the design, manufacture, and installation of aircraft medical interiors and other aerospace and medical transport products for domestic and international customers.

With specialty medical interiors that support intensive/critical care medical transports, Air Methods plans to equip each aircraft with standard technologies such as terrain avoidance warning systems (TAWS), night vision imaging systems (NVIS), satellite weather and tracking systems, search lights, and wire strike protection systems to further enhance safety.

LifeCom is Air Methods, Inc. recently renovated, fully equipped national communications center in Omaha, Nebraska, where they offer technologically advanced communications and satellite-tracking capabilities. Expert medical billing and collections are processed from their San Bernardino, Calif. facility. Air Methods Operational Control Center (OCC) in Englewood, CO monitors all flights. The Flight Management System (FMS) is a custom designed computer application that monitors and provides real-time weather and flight alerts for company aircraft. The OCC is staffed 24/7.

Through a contract with American Medical Response (AMR) and the Federal Emergency Management Agency (FEMA), the division provides air ambulance services in response to disaster situations. Aircraft and crews were on standby this year for Hurricane Dean, and dispatched to the Gulf in 2005 in the aftermath of Hurricane Katrina. During 2006, the division opened three new bases in the Southeast, three in the Northeast and one in California. Also in 2006, CBS programs began providing air medical transportation services to two U.S. Army bases in California and Georgia.

A voluntary accreditation, Air Methods, Inc. encourages all of their CBS programs to seek and maintain Commission on Accreditation of Medical Transport Systems (CAMTS) certification. CAMTS is an independent agency that audits and accredits fixed and rotor wing air medical transport and critical care ground services in the United States to a set of industry-established standards.

Classic

Classic began service with one helicopter and a medical crew of two basic EMT's on Memorial Day 1988. Classic began as a seasonal service to assist the National Park Service in transporting trauma patients off of Lake Powell to a trauma center. Classic started lifeguard air ambulance operations because the park service would often call

Classic tour helicopters from Bryce Canyon to airlift injured people off the lake. Mark Henderson, owner of Classic and Dan Rudert, pilot, decided to start Classic in response to the repeated requests for air evacuation services from the National Park Service (NPS).

Classic works closely with the NPS, Navajo Nation EMS, Arizona and Utah Highway Patrol, Page, Arizona Fire Department, and the various other agencies in Utah and Arizona.

At the time of the accident, Classic operated two Bell 407 helicopters and a fixed-wing Beech C90 KingAir. Their communications center is monitored 24/7.

Classic has logged over 5,000 missions since they began service in 1988. According to their website, "Safety is our number one priority and that will continue to be our focus as we operate in a very dangerous and unique environment."

Milestones for Classic:

1988 - Classic began flight operations
1989 - Flight crew changed to Paramedic/Paramedic
1991 - Flight crew changed to RN/Paramedic
1992 -Classic Lifeguard begins year round service
1998 - Classic hangar/FBO at Page Airport completed
1999 - Classic is awarded CAMTS accreditation
1999 - 2nd helicopter goes online from May-October in Page, Arizona
2001 - Upgrade full-time aircraft to Bell 407 helicopter

(a) Operational Control

Classic is a FAR Part 135 Air Carrier, which held on-demand operations specifications. Company headquarters are located in Woods Cross, Utah. The President/Owner, Director of Maintenance, Chief Pilot and Director of Operations reside in Woods Cross, Utah. The company also conducts utility and firefighting missions, which counts for a majority of their business. These operations are conducted from Utah.

N407MJ was operated by Classic Helicopter Services, Page, Arizona, and registered to M&J Leisure, L.L.C., Ogden, Utah.

The EMS function of the company is based in Page, Arizona, where the EMS Program Director/Lead Pilot, EMS pilots, medical crew, and dispatchers reside.

The operation is considered to be a CBS. The owner of the company owns the aircraft. The EMS pilots, medical crews, and staff are employees of Classic Helicopter Services.

2.0 Dispatch

Air Methods

Guardian Air operates a full time 24/7 centralized communications center called Guardian Control. They have VFR flight following responsibility for three fixed wing airplanes and three helicopters and are direct employees of Guardian Air. The center is staffed with transportation coordinators, who ares trained as a communications specialist under the Air Methods FAA approved training program. Some have accreditations from the National Association of Air Medical Communications Specialists (NAACS).

The center is co-located with the helicopter operation at FLG. They have three computers screens; the middle screen is used to show the GPS track of their aircraft on a map. The other two screens are for the use of the communicator. Radios are used to talk directly with the aircraft. A radio scanner is monitored for local issues.

Guardian Control utilizes for main repeaters to transmit and receive two-way communications. According to Guardian Control, all four towers were operating at the time of the accident. FMC owns the towers and is responsible for maintenance to all of the four towers. If maintenance were to be conducted to one of the towers then they would immediately contact Guardian Control and report the time and date of when the repeater would be inactive. GC would then inform the other operators. If a repeater were turned off, it would not affect any of the audio recording capability at Guardian Control, and one of the other three repeaters would be activated instead.

The repeaters could not be isolated. According to Guardian Control, all of the repeaters were functioning at the time of the accident and there had been no recent maintenance or problems with any of the repeaters. There are four lights on the radio, of which, one of the lights will illuminate indicating which repeater is being used during that particular transmission.

The center is staffed with one transportation coordinator during slow periods and two during the busier times. Typically they work 12-hour schedules alternating between night and day shifts.

Their duties include:

- Call Taking
- Coordinating assets for medical requests
- Offering Flights to Pilots
- Providing assistance for requests received by the crew during missions.
- Recording Flight Information into various computer systems.
- Flight Following
- PAIP notification

On duty pilots will brief with Guardian Control daily. Pilots call into the center to advise fuel loading, weather status, crew information and any restrictions that are in place. This information is written on a grease board on the wall of the center.

Flights originate with a phone call to the center. The closest most appropriate aircraft is selected and the crew is alerted via pager. Responding to the pager, the pilot and crew will call Guardian Control for details. The pilot does a risk assessment and makes a decision as to whether the flight can be completed.

If the mission is accepted the transportation coordinator will build the flight plan in the Air Methods Flight Log program and into their CAD system.

The center will flight follow the aircraft from departure to the completion of the flight and all required position reports.

Michelle Allen was the transportation coordinator on-duty at the time of the accident.

She has been employed as a transportation specialist at Guardian Control for 1.5 years. She is a licensed paramedic and had previous dispatch/communications experience with the Navajo County Police Department.

Ms. Allen had also completed the Air Methods transportation coordinator-training program, which certified her as an FAA Communications Specialist, and she satisfactorily completed recurrent training on April 28, 2008. She normally works a 12-hour, 2 on/3off or 3on/3off shift. She had been on duty for approximately 8 hours and 45 minutes at the time of the accident.

At the time of the event Ms. Allen was at her station, and the other part-time transport coordinator was cleaning up the office area. Ms. Allen stated that it is normally slow on Sundays, so that is why only one transport coordinator was at the duty station.

Ms. Allen dispatched N407GA from Flagstaff to Winslow to pick-up an intubated patient for medical transport to FMC. When N407GA departed Winslow, the pilot contacted Guardian Control, and mentioned that he was 20 minutes out from the airport. He requested weather information, and stated that he would land at FLG to drop off one of the medical crew. She then added an additional six minutes to the flight's ETA at FMC (5 minutes for the flight from FLG to FMC, and 1 minute for the occupant drop at FLG). Ms. Allen could see when the helicopter arrived at their hangar facility based at FLG then depart a minute later. The pilot called shortly after he departed to report that he was two minutes from landing at FMC.

Ms. Allen also stated that she got a call from Classic's communications center wondering if she had heard from the pilot of Classic helicopter, N407MJ. She said "no." She noted that N407GA was one minute overdue on the outer-link tracking system and tried to contact the pilot. She was unable to reach him. Ms. Allen then heard that there had been an accident at Buffalo Park over the EMS scanner, which was followed by a confirmation

that N407MJ and N407GA had collided and crashed east of the FMC helipad. She then initiated the company's emergency procedures.

Ms. Allen mentioned that she had been part of a practice emergency drill the week before the accident involving the accident pilot and she felt prepared to handle this emergency.

She also stated that the pilot of the Classic helicopter had not contacted Guardian Control. This was the first time in 1.5 years that a Classic pilot had not called Guardian Control. She was not sure why he did not call.

Classic

Classic operates a full time 24/7 centralized communications center called Classic Control. They have VFR flight following responsibility for two EMS helicopters and one fixed wing EMS airplane operated by an affiliated company under a separate air carrier certificate. All pilots, medical crewmembers, and dispatchers are direct employees of Classic or their affiliated company. The four full time dispatchers and the two part-time dispatchers are trained under Classic's internal dispatch training program.

Classic Control is co-located with the helicopter and fixed wing operations in Classic's two-story building and hangar at the Monument Valley Airport in Page, Arizona. It is equipped with two computer screens; one screen is used to show the GPS position of their aircraft on a map. The other computer screen is for the use of the dispatcher. A recorded UHF radio is used to talk directly with the aircraft in flight, and a recorded VHF radio is used to communicate with each of the three on-duty pilots and each of the nine on-duty medical crewmembers. The dispatchers have access to six telephone lines, but only two of those phone lines are recorded.
Classic Control is usually staffed with only one dispatcher. Typically they work a 12-hour schedule alternating between night and day shifts and are typically on duty for seven days and then off duty for seven days.

The dispatcher's duties include:

- Call Taking
- Coordinating assets for medical requests
- Making radio calls to medical crews and to pilots about those medical missions
- Providing assistance for requests received by the crew during missions, including assistance with weather data, and current weather radar.
- Recording information about each mission into the folder for that mission.
- Flight Following
- PAIP notification

The pilots and medical crews are all physically based in the same facility and the pilots typically brief in person with the communications center at the start of their daily shift. When out on a mission, the pilots will call into the center to advise fuel loading, weather status, crew information and any restrictions that is in place. This information is hand written by the dispatcher on the communications log, which is on the backside of a paper

report in a folder for each separate medical mission. The folder includes several other pages, which include specific information regarding the patient's personal information, medical information, and any other information, which is later used for billing purposes.

Flights originate with a phone call to the center. The first up helicopter or the fixed wing airplane is selected and the pilot and the two medical crewmembers are alerted by a direct call on VHF handheld portable radios, which are carried by each of those three persons.

The pilot does a risk assessment and makes a decision as to whether the flight can be completed. If the mission is accepted the dispatcher will continue to complete the entries in the folder for each separate mission.

Classic Control will flight follow the aircraft from departure to the completion of the flight and all required position reports with each of these events being recorded by handwritten entry on the paper communications log.

On July 4, 2008, Investigators interviewed Mr. Richard Leightner, who is the supervisor of Classic Control. Mr. Leightner has been employed by Classic since September 10, 1997, and was promoted to supervisor in 1999. His duty hours consisted of a seven-day shift that began on Monday and ended on Sunday followed by seven days in a row off duty. His shift began at 0600 and ended at 1800.

Mr. Leightner said two of the communications radio channels and only two of the telephone lines are automatically recorded. The system will record any time the microphone is activated or anytime there is any signal or any noise on the radio channel. There are about six telephone lines at the facility but the recording system only records conversations made on only the two telephone lines as follows:

- VHF portable hand held radio conversations
- UHF conversations on both Channel 1 to their repeater on Navajo Mountain, and on their Channel 2. Both UHF channels share the same receive frequency
- Telephone calls on the "Bat Phone" or emergency line, which is the incoming line for the toll-free emergency line
- One of the non-emergency lines, which is the line that crews will normally use to make their incoming calls to Classic Control

Each helicopter is equipped with a permanently mounted cell phone, which is not recorded.

Mr. Leightner told investigators that on the day of the accident both helicopters and the fixed-wing airplane had been dispatched[5], which he stated was a relatively rare occurrence. He handled all three flights and coordinated with the respective facilities.

[5] Lifeguard 1 was on a flight going to FMC from the South Rim of the Grand Canyon. The King Air was also dispatched on a patient flight at about the same time Lifeguard 2 departed the South Rim of the Grand Canyon to FMC

At 1519, the pilot of Lifeguard 2 called Classic Control and reported that they were departing the South Rim. Mr. Leightner called the Director of Security at FMC to let him know that Lifeguard 2 was inbound followed by a call to Guardian Control. He told the transport coordinator that N407MJ was 20 minutes from landing at FMC and she then informed him that Guardian Air helicopter N407GA was twenty minutes out and also inbound to FMC. He remembers that he told the coordinator to "be sure and let our guy know when he calls you."

Both of those telephone calls from Classic to FMC and from Classic to Guardian were on a telephone line that was not recorded by Classic.

At 1532 the pilot of Lifeguard 2 gave a 15-minute position report via the onboard radio. Mr. Leightner acknowledged the call but did not inform the pilot of the inbound Guardian Air helicopter. He said "we normally would notify our aircraft about another helicopter that was inbound at the same time." At that time, he said was unconcerned because the transportation coordinator at Guardian Control had told him that she would notify the pilot of Lifeguard 2 of the other inbound helicopter. Plus, Mr. Leightner said that he knew the pilot of Lifeguard 2 was "so anal" about contacting Guardian Control prior to landing at FMC.

Investigators played the recorded audio from the 1523 telephone call recorded by Guardian Control. Mr. Leightner said he knew that Guardian had recorded the telephone call, but he had not heard the tape. After listening to the Guardian Control recording he said he was amazed because he realized that he did not remember the correct arrival time of Guardian Air at FMC. He said he was "amazed" because he had incorrectly remembered his conversation with the Guardian Control transportation coordinator about who was supposed to advise Lifeguard 2 about N407GA.

He said, "I would have never guessed that Tom would have failed to call Guardian" on his arrival at Flagstaff because he was "so anal about making all of the calls correctly." He said "now I will have to baby sit everybody."

2.1 EMS Models

(a) Hospital-Based Services

The HBS division provides air medical transportation services to nearly 80 hospital customers in 33 states and operates a fleet of more than 200 hospital-based aircraft. Under this service model, the hospital owns the program and provides the medical personnel and communications functions, while Air Methods provides aircraft operation and maintenance.

In accordance with FAR Part 135 standards, flights are operated under instrument flight rules (IFR) and visual flight rules (VFR). The HBS fleet is equipped with a life support medical interior that ranges from basic life support to intensive care suites. Additionally, each aircraft is equipped with standard technologies to enhance safety including terrain avoidance warning system (TAWS), night vision imaging systems (NVIS), satellite weather and tracking systems, search lights, and wire strike protection system.

(b) Community-Based Services

Under our CBS model, Air Methods provides air medical transportation services at 91 bases in 21 states. Through a focused business model, they provide communities with high-quality, intensive/critical medical care. Typically based at hospitals, fire stations or airports, the division operates more than 100 helicopters and fixed-wing aircraft by instrument flight rules (IFR) and visual flight rules (VFR) under FAR Part 135 standards. Emergency transport is provided based on medical necessity as determined by hospital staff (physicians/nurses), EMS agencies (fire, rescue, ambulance, civil), law enforcement agencies and industrial safety personnel. Since 2002, CBS programs have flown 134,662 patient transports.

Classic is a Community-Based EMS operator.

2.2 Summary of Interviews

Any interviews obtained as part of this report are included in the NTSB Public Docket.

Leah D. Yeager
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National Transportation Safety Board