NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594

November 2, 2012

SPECIALIST'S FACTUAL REPORT

HUMAN PERFORMANCE

CEN11FA599

A. ACCIDENT

Operator:	Air Methods
Location:	Near Mosby MO
Date:	August 26, 2011
Time:	1841 central daylight time[1] (cdt)
Airplane:	Eurocopter AS-350-B2

B. HUMAN PERFORMANCE SPECIALIST[2]

Malcolm Brenner, Ph.D.
NTSB

C. SUMMARY

On August 26, 2011, at 1841 central daylight time, a Eurocopter AS-350-B2 helicopter, N352LN, sustained substantial damage when it impacted terrain following a loss of power near the Midwest National Air Center (GPH), Mosby, Missouri. The pilot, flight nurse, flight paramedic, and patient received fatal injuries. The emergency medical services (EMS) equipped helicopter was registered to Key Equipment Finance, Inc., and operated by Air Methods Corporation, doing business as "LifeNet In The Heartland." The 14 Code of Federal Regulations Part 135 medical flight departed from the Harrison County Community Hospital, Bethany, Missouri, about 1811, and was en route to GPH to refuel. After refueling, the flight was to deliver the patient to Liberty Hospital in

[1] All times are central daylight time based on a 24-hour clock, unless otherwise noted. Actual time of accident is approximate.
[2] NTSB investigator Maryam Allahyar, Ph.D., also participated in some of the investigative activities.

Liberty, Missouri, approximately 7 nm away. Visual meteorological conditions prevailed at the time of the accident, and a company visual flight rules (VFR) flight plan was filed.

D. DETAILS OF THE INVESTIGATION

The Human Performance Specialist worked with the Investigator-in-Charge to conduct follow up interviews and collect documents relevant to human issues in the investigation. This report focuses on the pilot's background and activities before the accident, medical issues, company policy on cellular telephone use, and the company's Operational Control Center (OCC) and Safety Office programs.

D.1 Pilot Background

The accident pilot, age 34, was hired by Air Methods in September 2010 and was initially stationed at the company's St. Joseph Missouri base. In April 2011, on his request, he transferred to the Rapid City, South Dakota base (where his wife had family). However, during the month of August 2011, the pilot accepted part-time work shifts at the St. Joseph base to help the company cover a temporary pilot shortage at that location.

The area aviation manager, who had hired the pilot, described him as a top candidate with a background in Army aviation who was very professional. The company instructor, who provided initial and recurrent training, described the accident pilot as very competent and safe. Co-workers spoke favorably of the accident pilot as a pleasant colleague always willing to assist. The pilot's wife stated that the accident pilot liked the company and co-workers, loved flying, and planned to continue his career in the air medical industry. Company records indicated no discipline or grievances for the accident pilot.

The pilot's wife stated that they had experienced no significant changes in their financial situation during the past 6 months. The pilot took a small pay cut when he began civilian flying, but the family had not experienced any major expenses during this period. However, according to his wife, the pilot's personal situation had experienced several significant changes during the past 6 months. These included: they were expecting their first child in November; they had bought a house at Rapid City after they moved there; and on August 22, the pilot's father, who lived at Lincoln Nebraska, underwent a successful heart operation.

According to FAA records, the pilot held a valid Second Class Medical Certificate issued 8/27/2010 with the no limitations. The medical record listed the pilot's distant and near vision as 20/20 in each eye. The FAA medical certificate listed the pilot's height as 6' 3" and weight as 258 lbs.

According to his wife, the pilot was very healthy and there were no major changes in his health during the previous six months. He did not use corrective lenses for eyesight, following Lasik surgery years earlier that allowed him to qualify for the 20/20 vision standards of military flight training. He owned several pairs of polarized green sunglasses that he used routinely when outdoors. His hearing was good. He did not smoke, did not take prescription medication, and drank coffee and alcohol sparingly. He never complained of medical issues, according to a medic who worked regularly with him.

According to his wife, the pilot did not have a standard sleeping schedule although, when he did not have work demands, he preferred to go to bed and awaken somewhat late. When he was working, according to his acquaintance from work,[3] the pilot would try to go to bed by 2200 to 2300 and awaken about one hour before reporting to duty. He was often tired before the accident as he was working at both Rapid City and St. Joseph bases, according to the acquaintance, and did not sleep well at hotels. The hotel at St. Joseph was noisy.

D.2 Activities Before the Accident

The pilot's activities in the days before the accident were reconstructed from witness interviews and electronic records.

On Saturday August 20, about 1700, after arriving early for work at the St. Joseph base, the accident pilot had a conversation with a visiting pilot. The visiting pilot said he seemed normal and very sociable, and during their conversation, the accident pilot mentioned that he was hoping for a quiet night because he had plans to visit his parents the following day. The pilot's shift was from 1830 to 0630 the following morning and company records indicate that there were no flight missions during the shift. Records from the pilot's cell phone indicate the last activity recorded was an outbound text message at 0100 on Sunday morning.

On Sunday, August 21, after completing his shift, the pilot checked out of the layover hotel and drove to Lincoln Nebraska via rental car to stay with his parents. About 1400, he drove to nearby Omaha, Nebraska to visit his acquaintance from work before returning to Lincoln later that evening. The acquaintance stated that the pilot was in very good spirits during the visit. Cell phone records indicate that the first activity recorded was an inbound telephone call (210 seconds duration) beginning at 0727; and the last activity recorded was an outbound text message at 0029 on Monday morning.

On Monday August 22, the pilot remained off-duty at his parents' home. That day, the pilot's father underwent successful heart surgery that proved less serious

[3] The acquaintance was a flight follower who handled dispatch communications with pilots and worked regularly with the accident pilot.

than expected. Cell phone records indicate that the first activity recorded was an outbound text message at 0755; and the last activity recorded was an outbound text message at 2304.

On Tuesday August 23, the pilot remained off-duty at his parents' home. Cell phone records indicate that the first activity recorded was an outbound text message at 1051; and the last activity recorded was an inbound telephone call (200 seconds duration) ending at 2225.

On Wednesday, August 24, the pilot began the day at his parents' home. According to his wife, on Wednesday evening the pilot departed from his parents' home and spent the night with a friend at Manhattan, Kansas on the way back to St. Joseph. Cell phone records indicate that the first activity recorded was an outbound text message at 1303; and the last activity recorded was an outbound text message at 2133.

On Thursday August 25, records indicated that the pilot checked into the layover hotel at St. Joseph at 1423. The hotel desk clerk, who met the pilot for the first time, described him as a very nice, happy, and polite man. The pilot was scheduled to attend company training beginning at 1630 (which consisted of annual recurrent aircraft ground training). The pilot's wife spoke twice with him on Thursday by telephone, soon after he arrived at the hotel and later that evening, and reported that he sounded good. The acquaintance from work spoke with the pilot late in the evening and reported that he stated that his training went well. Cell phone records indicate that the first activity recorded was an inbound telephone call (44 seconds duration) beginning at 1123; and the last activity recorded was an inbound telephone call (115 seconds duration) ending at 0019 on Friday morning.

On Friday August 26, the pilot was scheduled to work the day shift from 0630 to 1830.[4] According to the departing night shift pilot whom he relieved, the accident pilot arrived on schedule (or early) for duty. They spent at least 20 minutes briefing the shift change and the accident pilot seemed alert. According to the night shift pilot, the briefing covered the following items: the status of the active helicopter (101LN); the accident helicopter (352LN) was parked on the ramp; training had been completed on the accident helicopter, and that it needed to be reconfigured for medical work when the mechanic arrived; and the accident helicopter was low on fuel and needed refueling before it went into service. Between 0700-0730, the mechanic arrived and encountered the accident pilot who reported that he had moved the accident helicopter into the hangar to be reconfigured. The mechanic described the accident pilot as being in a normal mood, chipper and ready to go. About 0730, the departing flight nurse encountered the accident pilot and described him as his normal, boisterous self. About 1200, the accident pilot visited the mechanic in the hangar to ask about progress on the accident helicopter, and the mechanic and pilot walked together

[4] The hotel provided a complimentary breakfast to guests from 0600 to 0930 daily.

to the airport restaurant for lunch. They spoke about football and other general topics during the meal and returned to work about 1245. About 1400, according to the mechanic, he advised the crew that maintenance work was complete on the accident helicopter. The pilot performed a walk-around, the helicopter was moved outside to the pad, and the pilot and medical crew began the process of transferring the medical gear and preparing the helicopter for duty. This work was complete by 1530, according to the mechanic. Company procedures required the pilot to sign the daily log book to confirm his checkout of the helicopter, which included a preflight inspection of its fuel level, but examination after the accident indicated that the daily flight log was not signed for this work.

According to the acquaintance, in a call about 0830-0900 the pilot stated that he did not sleep well in the overnight hotel and felt tired. The pilot and his acquaintance had plans to meet for dinner after the pilot completed work on Friday.

According to cell phone records, the pilot made multiple telephone calls and sent multiple text messages throughout the day.[5] Figure 1 presents the timing of the cell phone calls and text messages with the timing of radio communications and flight activities from 1700 until the accident at 1841.

As shown in Figure 1, the outbound text messages were sent from the pilot's cell phone during time periods that the helicopter was in flight on the accident leg and the preceding leg.

D.3 MEDICAL AND PATHOLOGICAL ISSUES

Toxicological testing was conducted by the FAA Civil Aerospace Medical Institute (CAMI) on fluid and tissue specimens collected posthumously from the pilot. The vitreous tested negative for ethanol; and Naproxin was detected in the urine.[6]

D.4 Company Policy on Cellular Telephone Use

At the time of the accident, Air Methods had a written policy prohibiting pilots from using or turning on cellular telephones during active flight operations. The Air Methods Operations Manual stated (page B-7):

---

[5] According to the records, telephone calls were made from the pilot's cell phone at 0811, 0822, 0841, 0901, 1112, 1204, 1330, and 1552. Text messages were sent from the pilot's cell phone between 0853-0857, 0922-1057, 1130, 1147-1158, 1356, 1430-1450, 1621-1635, 1655, 1719-1722, 1746, 1802-1822.

[6] The drugs tested in the post accident analysis included (but are not limited to) marijuana, cocaine, opiates, phencyclidine, amphetamines, benzodiazapines, barbiturates, antidepressants, antihistamines, meprobamate, and methaqualone.

"CELL PHONES/PORTABLE ELECTRONIC DEVICES - UTILIZATION [135.144]

In compliance with FCC regulations, the PIC shall not allow cellular phones to be used or turned on during ground operations (including taxi and hover operations), takeoff, enroute, approach, and landing. Use of cellular phones while the aircraft is on the ground, not in motion, is acceptable provided it does not interfere with onboard navigation and/or communication equipment. The PIC will not allow portable electronic devices, such as personal data assistants (PDAs), laptop computers, etc. to be operated on board their aircraft unless an **EMI/RFI Flight Test Profile**, developed by Air Methods, has been conducted and completed successfully. Contact the Director of Maintenance for a copy of the EMI/RFI Flight Test Profile."[7]

D.5 Company Operational Control Center (OCC)/Safety Office[8]

In response to a 2006 NTSB recommendation,[9] Air Methods established in 2007 one of the first Operational Control Centers (OCC) in the Helicopter Emergency Medical Services industry. The purpose of the OCC was safety and oversight, and the OCC was made independent in function and location from the communications center that conducted routine flight following and communication with the pilots. Using specialized software developed by Air Methods, the OCC staff continually monitored all flight operations being conducted by the company with regard to flight plan, aircraft location, and nearby weather. The OCC generated alerts for weather hazards and operational deviations, passing this information to the communications center so it could alert pilots to developing hazards.

Because the OCC was staffed 24 hours per day, including at least one specialist on duty at all times with HEMS operational experience, the OCC was available as a central contact point for pilots to discuss operational issues such as difficult launch decisions. However, under company policy, the OCC did not share authority for "go/no go" decisions which were solely the responsibility of the

[7] According to a representative of the cell phone provider used by the accident pilot, the cellular telephone model used by the pilot allowed hands-free use of the telephone but did not have a built in feature to allow hands-free use of text messaging (where such a feature was available on some other models in which the cell phone transcribed a spoken response).

[8] A company-prepared description of the OCC and Safety Department is attached to this report.

[9] As a result of a special study of aviation Emergency Medical Services (EMS), the Safety Board issued in 2007 a series of recommendations that included the following:
"Require emergency medical services operators to use formalized dispatch and flight-following procedures that include up-to-date weather information and assistance in flight risk assessment decisions" (A-06-014). This recommendation is currently classified "Open-Acceptable Response." following FAA action that included issuing an Advisory Circular on Operational Control Centers in the EMS industry (cited below).

pilot-in-command (PIC). Further, according to interviews with pilots and dispatchers,[10] pilots rarely contacted the OCC to discuss operational issues. Contacts between pilots and the OCC were unusual and generally limited to issues of paperwork compliance and weather information for remote areas.

The FAA, in its advisory circular on the integration of OCCs within HEMS operations,[11] noted that "the main concept of OCCs and flight dispatch procedures is joint mission responsibility." It proposed a model for industry in which "the PIC should consult with an OCC specialist for flight approval concurrence at any time that a predetermined threshold is reached." Similarly, the NTSB has noted that:

> "The vast majority of HEMS accidents have historically involved poor decision-making by various personnel involved in launching or conducting a HEMS launch and in-flight decision-making by various personnel involved in launching or conducting a HEMS flight. Having OCCs who are trained and available to help manage the HEMS launch and in-flight decision-making will help pilots recognize and avoid high-risk situations."[12]

The Air Methods chief pilot indicated that, as a lesson learned from the present accident, the company might emphasize the use of the OCC as a single point of contact for pilots having operational concerns or difficult launch decisions. The OCC could provide guidance and coordinate communications with senior management who had authority for joint mission responsibility.

Air Methods maintained a Safety Department that, at the time of the accident, was implementing a Safety Management Systems (SMS), one of the first in the air medical industry. Programs developed under the SMS included a Technical Review Board, Root Cause Analysis process, Aviation Safety Action Program (ASAP), Maintenance Safety Action Program (MSAP), Internal Evaluation Program, as well as company safety publications. Interviews indicated that line pilots had a limited knowledge or contact with the Safety Department and its activities, with an exception of the ASAP program, and the director of safety indicated that the SMS was a work in progress and that efforts were being made to effectively communicate Safety Office programs to benefit the company's highly-dispersed pilot community.

---

[10] The investigation interviewed two flight followers, a dispatch supervisor, four line pilots, one training pilot, and the Chief Pilot and Director of Operations.

[11] Advisory Circular 120-96, Integration of Operations Control Centers into Helicopter Emergency Medical Services Operations. Federal Aviation Administration, Washington D.C., May 2008.

[12] National Transportation Safety Board (2010). Comments on Notice of Proposed Rulemaking (NPRM) titled "14 CFR Parts 1, 91, 120, 1nd 135 Air Ambulance and Commercial Helicopter Operations, Part 91 Helicopter Operations, and Part 135 Aircraft Operations; Safety initiatives and Miscellaneous Amendments; Proposed Rule" published on October 12, 2010.

LIST OF ATTACHMENTS

INTERVIEW SUMMARY

Interview:	Pilot's Wife
Date:	September 15, 2011
Time:	1700 cdt
Location:	Telephone Interview
Present:	Malcolm Brenner, Jim Silliman

The pilot's wife provided the following information:

She last saw her husband on August 11, 2011 when he departed to travel to St. Joseph for a work assignment. Her husband had been based at Rapid City since April 2011, but he was still helping out at St. Joseph by working shifts there during the month of August. She and her husband continued to talk regularly by telephone after he departed.

Her husband had been stationed in Fort Riley, Kansas and they had lived just outside of Manhattan. When he began working for Air Methods and was stationed at St. Joseph, he kept a local apartment at St. Joseph where he would stay for the week while he was working and then he would come home. They moved in June to Rapid City where they bought a house.

He normally went to St. Joseph for a few days at a time for his work assignments, and he seemed to be spending the majority of August 2011 at St. Joseph. He had traveled there during the first week of August and the company flew him via commercial flight. For the trip on August 11, which covered a longer period of time, he drove in a rental car provided by the company. The company also paid hotel expenses and a per diem reimbursement for the work assignment.

She last spoke with her husband by telephone about 2130 or 2200 (mountain daylight time) on the evening of August 25 as she was getting ready to go to bed. It was typical for them to talk when he was away from home just before she went to bed. He sounded good, asked how her day was, and told her he made it back to St. Joseph OK. It was just a routine conversation and he was fine. He was staying at a hotel in St. Joseph, perhaps a Drury Inn, on this trip. He had just been off-duty for the preceding few days during which he had stayed with his parents in Lincoln Nebraska. His father had undergone heart surgery during this time period to insert a stint or catheter. She thought that her husband stayed overnight with a friend in Manhattan Kansas on Wednesday night on his way back to St. Joseph. He then returned to St. Joseph on Thursday to start

work on Friday. The drive from Manhattan to St. Joseph takes about two hours.

They spoke by telephone earlier on August 25 as well. He left her a telephone voice message when he began his trip back to St. Joseph saying that she should call him when she got off work. She called back about 1900 (mountain daylight time) and he was in St. Joseph just getting settled into the hotel.

When he did not have work requirements, her husband liked to stay up a little late before going to bed and awaken later in the morning. But he was used to variable work schedules due to many years of active duty in the Army, in which he may have started work at midnight, 0500, or any time during the day, and he did pretty well with changing schedules. She told him many times that she did not understand how he could flip back and forth between day and night schedules and that she would have struggled with this, but he said that you just become accustomed to it and that he had done this for enough years that he could change back and forth without great problems. She thought he was sleeping well before the accident. He had experienced significant stress that summer from moving and closing on a house, but he said that now, with all that finished, he was sleeping much better just because he was not stressed about the house.

The pilot learned about his father's medical condition and operation a few weeks earlier. It turned out that the procedure was more minor than expected and the operation went very well. The father did not need a stent after all. The pilot arrived in Lincoln on August 21 and the procedure was the next day.

The pilot was very healthy, just your average 34-year-old. He had old orthopedic injuries in his joints from playing football and from running and Army training, but nothing major. There had been no major changes in his health in the past six months. There had been no major changes in his financial condition in the past 6 months. He had taken a small pay cut when he left the Army, but he started with Air Methods in September 2010 so it was not significant enough that it changed their financial situation. She herself found work as a physical therapist shortly after they moved to Rapid City. Regarding personal changes in the past six months, they had moved to a new house, the pilot's father had a heart operation, and they were expecting their first baby in November.

The pilot had always been interested in flying, but was unable to meet the vision requirements of military aviation until standards allowed Lasik surgery. He underwent Lasik surgery and was accepted into flight school. He did not wear corrective lenses at the time of the accident. He did wear sunglasses when he was outdoors, owning about five pairs that were all polarized so he could use them while flying. His hearing was good. He drank alcohol socially, such as a beer or two when they had friends visiting, but did not drink on a daily basis. He did not use prescription medication. He did not smoke tobacco. He drank coffee

on rare occasions, such as if he had a long drive, but he more commonly drank soda because it had less caffeine.

He was happy with his job at Air Methods. He loved flying and always spoke highly of the people he worked with. His goals included someday moving into management, such as becoming a lead pilot or a regional manager. He knew that, due to his Army background, his back might not hold up physically to allow him to fly for another 20 years. He had talked about other career options, but wanted to fly as long as he could.

Rapid City was his assigned base, but he was still helping out by working at St. Joseph because of a temporary pilot shortage there. He was familiar with the local area and the company asked if he would be willing to help out.

He had not experienced any previous emergencies with Air Methods. He likely experienced emergencies in the military since he completed 8 years active service flying attack helicopters.

She is a physical therapist and is not herself a pilot.

INTERVIEW SUMMARY

Interview:	Lisa Berry (Owner) and Stacey Vannaman (Head waitress) Airport restaurant
Date:	September 15, 2011
Time:	1230 cdt
Location:	St. Joseph Airport restaurant
Present:	Malcolm Brenner (NTSB), Jim Silliman (NTSB)

Ms. Berry and Vannaman were interviewed together at their restaurant, located in the control tower building at the St. Joseph Airport. Ms. Berry has owned the restaurant for 4 ½ years. They provided the following information:

The accident pilot ("James") was a regular customer, who always came to the restaurant as part of a group of Air Methods co-workers based at the airport. They visited the restaurant at least once per week and more often depending on how busy they were. They kept a company radio with them in case they were called. They would sit and talk, but never talked about aviation or their missions. They were amazing jokesters who regularly made each other laugh and were in a good mood. They were fun to be around. There was never a rude word from them. They were never aggressive with each other. Other customers would get rude, but not this group. You could mess up their food order and it was OK.

James had a big appetite and a nice smile. He was a big guy, a big teddy bear, and he always wanted more food. For breakfast, he loved the special which consisted of the following: chunky potatoes, onions, peppers, cheese, gravy, eggs on top, cooked in a 9" skillet and served with bread. He also loved the hamburger steak or a big cheeseburger. He tipped. Ms. Vannaman said that James was her favorite because of his smile.

James was there more often than other co-workers, especially as he was separated from his wife and it was hard for him to be away. He and mechanic Kevin Coulter ("Kevin") were together all the time. Ms. Berry and Vannaman joked that "we are their second wives and have to feed them."

Neither Ms. Berry nor Vannaman worked at the restaurant on Friday August 26 and neither had knowledge of the pilot's activities that day.

INTERVIEW SUMMARY

Interview:	Peggy Lockhart Hotel desk clerk
Date:	October 18, 2011
Time:	1230 edt
Location:	Telephone Interview
Present:	Malcolm Brenner (NTSB), Jim Silliman (NTSB)

At the time of the accident, Ms. Lockhart worked at the Drury Inn and Suites hotel at St Joseph MO. This hotel was used by Air Methods to house the accident pilot when he was commuting into the local area to work at the St. Joseph base.

Ms. Lockhart was the employee at the front desk who checked the pilot into the hotel on August 25. She stated that this was the first time she met the accident pilot. He was a very nice, happy, and polite man. She had no further contact with him.

INTERVIEW SUMMARY

Interview:	Patty Mooney Pilot's acquaintance from work
Date:	October 31, 2011
Time:	1030 edt
Location:	Telephone Interview
Present:	Malcolm Brenner (NTSB), Maryam Allahyar (NTSB)

Ms. Mooney provided the following information:

She was hired by Air Methods in November 2008 as a communications specialist. At the time of the accident, she provided flight following for a large area of the Midwestern United States that included the St. Joseph and Rapid City bases. She met the accident pilot through work soon after he joined the company in December 2010 and they became very close friends. She was not working on the day of the accident, and resigned from Air Methods soon after the accident for personal reasons.

Ms. Mooney provided the following information regarding the pilot's activities before the accident. On Sunday 8/21, the pilot, off-duty following a multi-day work shift at the St. Joseph base, departed St. Joseph in the morning and drove to Lincoln Nebraska to visit his family. His parents lived there along with his brother, brother's wife, and several nieces. The pilot then drove to Omaha Nebraska, arriving about 1400, to visit with her and her family. They attended a movie theater at Council Bluffs along with three of her children (ages 8, 10, and 14) and saw the new Smurfs movie, and then went to an arcade to play video games. She took the children home and then met the pilot for dinner along with her brother at an Italian restaurant. The brother went home after dinner and she and the pilot drove around the local area looking for a new car for her to purchase. The pilot was laughing, telling small jokes all evening, and was in very good spirits.

From that night through Wednesday 8/24, the pilot stayed at his parents' house at Lincoln. His father underwent surgery, perhaps on Monday 8/22, and it turned out OK. Ms. Mooney talked with the pilot by telephone every day throughout the week. On Thursday 8/25, about 1630, the pilot was scheduled to attend ground training at St. Joseph. He returned to St. Joseph on Wednesday evening to be ready for the training, staying at the company-provided hotel. Ms. Mooney spoke

with him by telephone on Thursday evening for 2-3 hours ending between 2300 and midnight. He indicated that his training went well.

On the day of the accident, Ms. Mooney communicated back and forth with the pilot. It was normal for them to talk by telephone when he was available or text back and forth when he was busy. She first spoke with him by telephone about 0830-0900, perhaps just after he woke up, and he indicated that he felt tired and he had not slept well. About 1130, he left a telephone voice message and said he was helping the mechanic pull the duals back in so they could get the accident helicopter back in service. He sounded normal. About 1330 they spoke again by telephone and he did not sound tired in the later calls. He also sent text messages to her that day up to the accident flight that addressed normal, everyday things. He stated in a text message that he had been working on the helicopter most of the day with the mechanic, and was assisting the mechanic with preflight duties to get the helicopter back in service. He sounded fine and normal all day.

The pilot was tired a lot during that period, as he was working at both the Rapid City and St. Joseph bases. He would work at Rapid City, have a few days off, and then come down to St. Joseph. He would try to go to bed by 2200 to 2300 and awaken about one hour before he had to go to work. At St. Joseph, he had to be at work about 0700. He did not sleep as well at the hotel as he did at home in his own bed and he would much rather have been home. He probably slept OK when he stayed at his family's house at Lincoln, at least he never complained about it. But he did not sleep as well at hotels. The hotel that he was staying at St. Joseph had a lot of noise. The pilots also have an option of sleeping in the pilot house while on duty if nothing is going on. She did not know whether he slept in the pilot house on the day of the accident but he probably did if they were not busy. He would lie down and take a nap.

The pilot moved to South Dakota about July 2011. When he first moved, he was working a schedule of half-week on, half week off, but then the company ran short of pilots at St. Joseph and asked if he would work at both bases. So he would work in South Dakota, have one or two days off, fly to St. Joseph to work one week there, have a day or two off, and fly back to South Dakota. This was a temporary schedule.

He did not like working all the time and felt like he had no life. He could not plan anything because he did not know if he had to work. But he liked saving people and loved to fly.

When he worked at the St. Joseph base, his schedule was daytime on Friday, Saturday, and Sunday, nighttime on Monday through Thursday, and then 7 days off. He had the same shift at Rapid City.

He was a very good pilot, always very cautious. He was very meticulous about the job and very thorough. She did not fly with him. As a communications specialist, she would always receive a call from him when he lifted and again when he landed, first on radio and then cell phone. He was one of the few pilots who was always happy to fly. He was ready to go, always prepared, and they could always get in touch with him. Crew members liked him and said they felt safe flying with him. He had turned down flights due to fog and weather. If needed, they could delay flights a few minutes to put on extra fuel as necessary. It was not unusual for a pilot to work with the mechanic, to try to assist when the mechanic was working on a helicopter.

They had plans to meet for dinner on the evening of the accident. After the pilot dropped off the patient, he was going to telephone her and she would drive down to St. Joseph to meet him.

Air Methods®

The Exclusive Airborne Healthcare Company...Since 1980

Air Methods Corporation
Denver/Centennial Airport
NASDAQ/GSMS: AIRM

May 9, 2012

NTSB
Malcolm Brenner
CEN11FA599

Dear Mr. Brenner,

Air Methods Operational Control Center

In 2006 the NTSB recommended that Helicopter Emergency Medical Service operators (HEMS) establish operations control centers and formalized dispatch procedures. Air Methods CEO Aaron Todd established an Operational Control Center (OCC) which opened in March 2007 at their corporate headquarters in Englewood, CO. The primary goal was to improve the safety of their flight operations. Since April 2008, Air Methods has maintained 24/7 staffing of their industry leading OCC in order to enhance safety and ensure compliance of its flight operations. This may seem like a very daunting task with over 300 bases, 400 helicopters, 1,300 pilots and over 4,000 medical crewmembers relying on their vigilance. In order to manage these responsibilities, Air Methods created custom software solutions that blended real-time information such as weather, electronic flight plans and hazards to flight together with geographical information system (GIS) technology. This proprietary system was designed to provide a single source of real-time information that allows the OCC to monitor all of its operations from a single location. This automation of GPS tracked aircraft, flight plans and potential hazards are what allow the Operational Control Center to manage such a workload with only a two-person on-shift staffing level. The automated systems cross-check all flight operations and only alert the OCC staff of impending hazards within predetermined thresholds that can be tailored based upon the type of threat. This allows the Operational Control Specialists to focus their attention on alerting pilots of hazards before they become a significant threat to the flight. These safety alerts and OCC interventions typically involve the local communications center so they can also maintain the same high level of situational awareness. In addition to the customized alerts that are pre-programmed into the system, Air Methods can also add instant alert areas that will notify the OCC of potentially dangerous situations such as TFRs, reported turbulence or other hazards. In addition to alerting due to inflight hazards, the OCC will also receive an alert if an aircraft strays from its electronic flight plan as submitted by the communications center. This route deviation may be due outside factors such as weather or it could be due to a data entry error by the flight follower in the communications center or the pilot in command. Either way, these errors can be corrected before they continue as another link in a possible accident chain.

In addition to the numerous automated systems used by the OCC, possibly the most critical component to its success is the human element. The OCC staffing has always

been structured so that there is always at least one pilot with Helicopter Emergency Medical Service experience present and some are certificated FAR part 121 dispatchers. This provides a key element to field based HEMS pilots that find themselves in a stressful situation and need someone to discuss their decision making process with. While the pilot in command still retains operational control of the flight, they also know that there is someone available to help answer their questions at any time day or night. Often, this experienced Operational Control Specialist is able to provide input with regards to flight operations that can help break a chain of events before it leads to an incident or accident. Additionally, the OCC has ready access at all times to the entire certificate management team as well as field based and executive management. This fact is critical in the event of an actual accident when the OCC serves as the single point of contact for activation of the Air Methods' Emergency Response Plan.

Air Methods Safety Department

Since 2007, Air Methods has made numerous significant improvements in its corporate safety program. Air Methods' progress in maturing our FAA-overseen Safety Management System has been successful. Air Methods is "the" industry leader in development of SMS work tools and implementation of a full SMS program. Air Methods exited Level 2 SMS status in December 2010 and remains one of only 8 commercial air operators to earn a Level 2 SMS acknowledgment letter. Air Methods was the first helicopter air medical operator in the program, and the only air medical operator who has progressed to this level in the process. Currently, Delta and U.S. Airways are still the only two certificates that have exited Level 3. Both Air Methods and United/Continental are scheduled for Level 3 exit in 2012.

Air Methods has a Level 3 calibration visit during the first week of April which will include the SMS program office and the company's Certificate Management Team. Level 3 elements scheduled for this year at Air Methods include:
Implementation of ETQ enterprise SMS management software;
Implementation of an approved FOQA program
Safety Culture Survey; and
Continue with SMS training and maturing existing systems and programs.

Under the direction of Air Methods' senior management team, a variety of benchmarks and performance indicators have been established and are frequently measured and monitored including:

Incidents with damage exceeding $25,000 are compared by quarter and per 100,000 flight hours.
Fatal accidents as a two-year trailing average are compared against HEMS per 100,000 flight hours.
The cumulative 5-year fatal accident rate per 100,000 flight hours is reviewed
CFIT cumulative fatal accidents from 2007 to date, per 100,000 flight hours, comparing Air Methods vs. HEMS is reviewed
A comparison of NVG flights to NVG bases year over year is analyzed

Additionally, the Safety Department has an extensive Incident Tracking log to track and trend events. The Trends are divided into six main categories Career; Illumination; Week; Flight profile; Weather; and Engine. Within these there are 124 data points. Further

trending of these events extends to aircraft type, area of the country, and engines. Ground incidents also are tracked and trended. All data is monitored by a variety of teams and discussed at many levels including the Systems Improvement Roundtable (monthly meeting of middle managers), Systems Action Roundtable (monthly meeting of COO and divisional managers), Safety Council (monthly meeting of CEO and senior staff), and Event Review Committee (bi-monthly).

Under the umbrella of the SMS, Air Methods has established a Technical Review Board, Root Cause Analysis process, Aviation Safety Action Program (ASAP), Maintenance Safety Action Program (MSAP), Internal Evaluation Program, Corporate Publications, Alertline and distribution of the monthly Safety Connect newsletter. In addition, to facilitate the management of the voluntary safety programs mentioned above Air Methods has increased staffing for the Safety Department by 300% to include full-time, field-based regional safety professionals.

Currently, Air Methods is a participant in the Flight Safety Foundation project which is working toward gathering flight data specific to HEMS. As part of that project Air Methods is collecting data from 35 Appareo Systems units. With the assistance of Appareo, Air Methods' safety department is in the process of downloading the data and is finalizing its data analysis. In Q2'2012, Air Methods will formalize its Flight Operations Quality Assurance (FOQA) initiative. First, a FOQA manager will be hired to oversee the program. Next, under the direction of the company's Technology Review Committee a hardware vendor and analysis software vendor will be chosen. There are 5 major hardware vendors Air Methods is evaluating with an eye toward scalability of the product to collect data on modern and legacy aircraft. Air Methods expects to kick off the program in Q2 2012.

Respectfully,

Dennis R. McCall
Chief Pilot