

National Transportation Safety Board
Helicopter EMS Public Hearing
February 3-6, 2009

Small Operators' Comments

CareFlite served as an Interested Party at these hearings to represent small HEMS operators at the invitation of the NTSB. This document contains additional comments from this interested party on behalf of small HEMS operators across the country. The comments below are organized in the order of the topics at the hearings.

Panel 1: Historical Risks, Safety Initiatives, Canadian HEMS

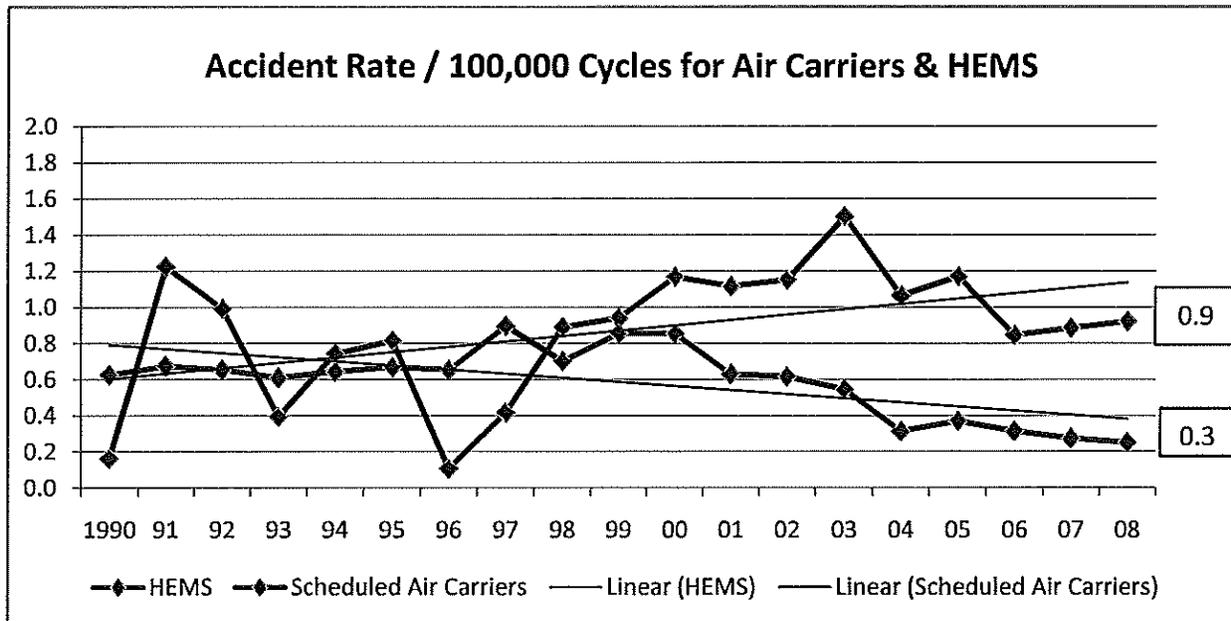
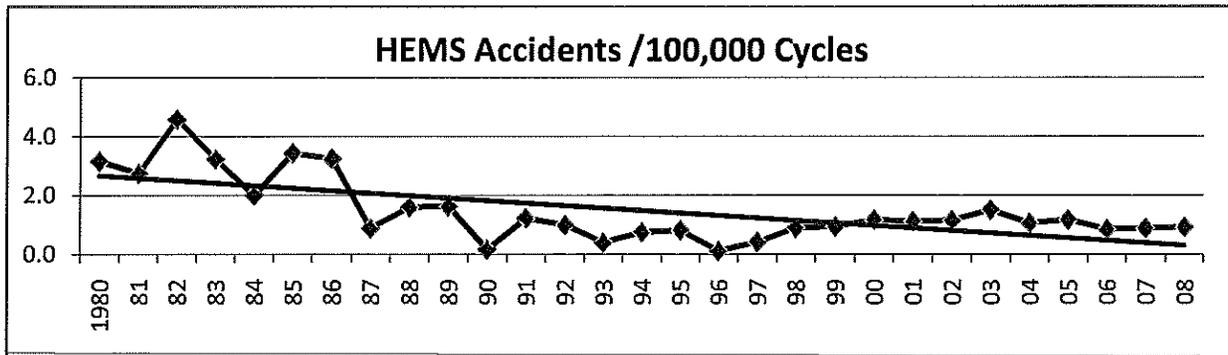
Dr. Ira Blumen presented the historical risks of HEMS. The picture he painted was of an industry outside the pale of "acceptable" safety results. His comparisons between HEMS and all other forms of aviation in slide #31 were based on flight hours not on relative risk. First of all, Dr. Blumen only included 2008 data for HEMS while ending all other lines of data with 2007. Second, comparing flight hours may be an appropriate measure within fixed wing or rotor wing data, it is not a valid measure of fixed wing versus rotor wing since the average HEMS operator, (based on CareFlite's experience) does 3 cycles per hour on average while Part 121 carrier data from DOT shows that the average flight time per segment (one cycle) was 1.7 hours for the 12 months ending 11/30/08. In other words, we fly about 6 cycles in the same flight time as the average Part 121 carrier flew in the most recent 12 months. That makes our risk of an accident actually 6 times as great if 1.7 hours was used as the basis of a comparison. Why? Because we will complete 6 cycles (each cycle being one take off and one landing) in that time period while the Part 121 carrier will complete only one cycle. Most safety experts would agree that the risk is predominately in the take offs and landings. On a one hour flight basis, our risk is still about six times as great...but our accident rate is only three times as great. (Half of an average part 121 segment is 0.86...so that is half of one cycle for them. For HEMS 0.9 equals 3 complete cycles.) The author of this section is a pilot who has flown both helicopters and air carrier jets. The differences in the way lift is created in rotary versus fixed wing flight should be considered by the NTSB.

With the caveats that we are not statisticians... and that the data presented below includes certain assumptions:

1. 25,000 industry total patient transports in 1980 rising to 400,000 in 2008 (presented in a linear manner – rising annually by an average amount)
2. CareFlite experience used as the basis for average flight time per cycle (CareFlite historically flies about 1% of the total HEMS patients per year)

Attachment #1 is a file that looks at HEMS accident rates from 1980 until the present based on accidents per 100,000 cycles rather than per 100,000 flight hours. The first thing you will notice is that the trend line within the industry has been steadily declining. Then we

compared our HEMS accident rate to Part 121 and scheduled part 135 air carriers. (Sometime during the late 1990's, all aircraft in scheduled service with 10 seats or more came under Part 121.) This paints a very different picture than that painted by Dr. Blumen's data at the NTSB hearings. While our rate was three times that of the scheduled carriers in 2008 (0.9 vs 0.3), and certainly not acceptable, that is very different from slide #31 in Dr. Blumen's presentation.



So, data and experience leads us to the conclusion that we operate in an environment of much greater risk whatever measure is used. The data tells us that if the measure is per flight hour, our risk is six times higher but our accident rate at only three times higher actually supports the conclusion that we are relatively safer. Not that we think we are safe enough...we are never really safe and significant improvements need to be made. If the measure is per cycle, then we are less safe (by a factor of three times). While we did not study the all helicopter data or the other GA data, given the fact that their rates are higher than HEMS in Dr. Blumen's study (based only on flight hours) and assuming that their average flight time per segment is greater than 0.3 (which seems likely), we are confident that our accident rates really are lower whatever measure is used.

The real question is how we respond to that greater risk.

We don't want anyone to assume that we don't support increased levels of safety and the use of additional technology. That would not be true. CareFlite and the small Operators have been and always will be a leader in upgraded safety. We just want to point out that the data presented to the NTSB gives an incomplete view of the total risk versus the accident rate.

We also suggest that the safety record of HEMS within Canada be more closely studied to determine the reasons for their superb safety record. While the physical operating environment is very different in the southern U.S. (from Canada), their processes and standards have achieved results far better than ours.

Panel 2: Current EMS Models and Reimbursement Structures

We view the fundamental barrier to improved safety the methodology of reimbursement. The government programs Medicare (federal) and Medicaid (state administered, jointly financed) use a flat rate structure. While the rates vary (urban or rural), the amount paid per patient flight is based upon the location from which the patient loaded flight departs. The use of such a payment methodology creates an economic incentive to those entities that operate with the lowest capital and operating costs. By not recognizing and paying for those patient transports that operate with additional levels of sophisticated technology (such as IFR, twin engine, NVG's, TAWS), the government programs drive the incentive to operate in a less safe manner. Unlike the FAA (a regulatory agency that is required to set minimum standards), the government programs that finance the service should immediately move to a tiered payment system that pays higher rates for those flights conducted with equipment and procedures that are recognized as providing a higher level of safety.

Operators of ground ambulance are in fact paid based on the level of care provided (generally Basic Life Support, Advanced Life Support and Critical Care) by Medicare nationally and by Medicaid in some states. In order to provide levels of care above BLS, ambulances must have additional, specialized equipment and attendants trained to a higher level (EMT Basic for BLS, Paramedic of ALS, and Registered Nurse for most critical care). In responding to a 911 emergency, for example, ground ambulance operators may respond with BLS ambulances if that is the only level available. Conversely, that same patient would be in a safer environment for that transport if the 911 operator responded with an ALS ambulance. The Medicare rules have certain minimum requirements for the operator to be paid at an ALS versus BLS level. Assuming those requirements are met, the ambulance operator is paid a higher rate for providing a higher level of care and safety. This makes the economic incentive to provide a higher level of care if appropriate to the patient. Those operators that choose to offer this higher level, receive higher reimbursement from the government.

Unless the government adopts a similar approach that economically rewards those operators who move to a higher level of safety and quality, the economic incentive will remain at odds

with the NTSB's efforts to increase safety. Relying solely upon the FAA to set higher minimum standards to improve safety without modifying the economic incentives to match the desire for increased safety in operations, means that the government is favoring those operations that operate on a lower cost basis. In the air medical industry, that equates directly to a lower level of safety. The federal government and the states are huge customers for air medical transport services. If they really want higher levels of safety and quality, they should be prepared to set up incentives to reward those that do so and penalize those that don't. This reconfiguration of reimbursement can be done on a budget neutral basis.

In addition to issuing recommendations to the FAA, we urge the NTSB to issue recommendations concerning reimbursement practices at Medicare and Medicaid that support higher payments for those operations that are operated in a higher level of safety. These federal programs as well as the new Administration and Congress need to be aware that unless they participate in this effort to improve safety and quality, they share the responsibility for a continuation of the past practices that have brought us to this point.

Only by aligning the minimum standards set by the FAA with the economic incentives that result from revised reimbursement policies in Medicare and Medicaid, would the NTSB be recommending the comprehensive solutions that the federal government alone could undertake to make the whole system operate in the safest possible manner.

Panel 3: State Oversight and Competition

The Panel on State Oversight and Competition was made up of a representative from the National Association of State EMS Officials, Mr. Dan Manz, Director of EMS for Vermont; Dr. Bryan Bledsoe an emergency physician from Las Vegas, NV, and Dr. David Thompson, an emergency physician representing AAMS.

OVERSIGHT

There are many claims that the lines of medical oversight and aviation oversight have been blurred due to case law associated to the Airline Deregulation Act (ADA). However a review of the case law surrounding the ADA as it pertains to medical transport finds the case law surprisingly consistent and the rulings very specific. The courts findings have been that the certification and oversight of medical personnel and the patient care they provide is the responsibility of the State. The courts have commented very clearly on which area is an FAA oversight and which area is the States. Claims that the lines of medical and aviation oversight are blurred do not bear up when exposed against the case history surrounding the ADA. Often these claims have less to do with safety or patient care and are really about positioning for competitive advantage.

The courts have found against States on practices that limit access or competition or in areas that are the purview of the FAA. Certificate of Need (CON) or exclusive operating programs that limit air ambulance services in a given area have consistently been found to be in violation of the ADA. CON programs and similar mechanisms have repeatedly been found

not to be in the best interest of public health as they limit resources, competition and patient access.

COMPETITION

Competition is a broad issue with both safety and overall industry implications. There is no empirical data that supports the position that competition is a major safety issue. Areas that have heavy competition do not appear to have a higher rate of accidents than less competitive areas. However, from a safety perspective, it is accepted to be one of many issues or factors weighing on the mind of a HEMS pilot in the course of a flight. Pilots and medical staff are highly intelligent and can clearly see when an organization is in distress whether from competition or other business issues. Business issues pose a challenge to management to ensure that crews are not taking flights or greater risk for some perceived business benefit. However, the fact that many of the accidents occur when crews are returning to base indicates that other factors besides competition or business performance may have a greater effect. A pilot may have many issues distracting them; competition, family issues, disagreements with fellow crew members, financial issues etc. This is not unique to HEMS operators but affects public organizations as well. HEMS operators recruit and train the most experienced helicopter pilots in aviation with the expectation that years of experience bring habits of concentration to overcome these distractions which are not unique to HEMS. Training with a greater emphasis and understanding of human factors could prove beneficial in this area.

From an industry perspective competition has a very positive effect. Competition ensures better patient access by providing more resources to a community. This is particularly helpful in disaster situations. It encourages better clinical and operational practices and the earlier use of new proven technology and helps keep patient charges in check. Competition grows markets beyond the level that one provider can cover. These benefits are not unique to HEMS, but universally found in virtually all businesses.

Panel 4: Patient Transport Request Processes

For helicopter EMS response to the scene of a traumatic accident or medical emergency, a ground EMS service provider, fire department, or law enforcement agency usually makes the request via their 911' Public Service Access Point (PSAP) center to the Helicopter EMS dispatch center. Request for patient transport between hospitals is generally "ordered" by a physician but the direct contact to the Helicopter EMS dispatch center is made by nursing or clerical personnel from the sending facility. Helicopter EMS services should never self-initiate a dispatch to an accident scene or hospital.

While some may argue the cost savings of having their helicopter dispatch centers centrally located where their headquarters are, despite the location of the caller and the subsequent responding aircraft, the presence of "local" Helicopter EMS dispatch centers provides an enhanced Safety benefit to the air-medical crew and the patients they serve.

Unlike a prototypical operator in the "airline industry" who use Part-121 Dispatchers to aid in flight decision making regarding flights that traverse great distances with take off/landing operations at each end, Helicopter EMS operations have multiple take off and landings while covering significantly less distances. Local Helicopter EMS dispatching centers are able to assess weather conditions, trend the information with past experiences, and forecast future weather development. Local Helicopter EMS dispatch centers are able to coordinate helipad operations and refueling arrangements for aircraft operating in this environment.

While it is clear that there are varying degrees of training programs for flight communication specialist based upon their program, the Part-121 curriculum does not contain the necessary components to prepare or qualify them as air-medical communication specialist. Therefore, it is recommended that the NTSB should encourage the development of an approved Air-Medical Communication Specialist training program, which could be coordinated by the FAA.

The National Association of Air Communication Specialist (NAACS) training program contains the information for the air-medical services provision but lacks in some of the knowledge objectives from the Part-121 Dispatch course. Completion of a Part-121 Dispatcher Licensure process does not indicate proficiency in task associated with Helicopter EMS dispatch operations as the tasking are completely different than airline industry operations. Due to the lack of applicability of the Part-121 content to the Helicopter EMS operator, the suggested course of action would be to enhance the NAACS training program with information desired by the NTSB.

An additional factor that must be considered with Helicopter EMS operations is the activation of the resource itself. There are multiple groups (i.e. National Association of EMS Physicians, American College of Emergency Physicians, Air Medical Physicians Association, etc.) who have developed criteria for Helicopter EMS activation and utilization. Unfortunately, the employees and staff of the numerous Helicopter EMS providers ARE NOT the ones who are present at the hospitals or sites of the emergency and place the calls for assistance. Helicopter EMS providers are the receivers of the request for services and have great difficulty in "triaging" calls from requesting parties.

This creates a situation for reimbursement concerns for Helicopter EMS operators who provide service. As an example, Medicare and Medicaid services do not have a published list of "Appropriate" patients to be transported by Helicopter EMS but are in the driver's seat because of their ability to deny payment for patients that are transported "Inappropriately."

This would be best managed by an adopted list of nationally recognized criteria for Helicopter EMS activation and utilization.

There has been some discussion regarding "regional" or "state" call taking/dispatch centers. Unfortunately, this leads to the proposal of the closest helicopter being sent to the requesting agency. The NTSB was briefed during the HEMS Safety Hearings about the varying levels of

safety and patient care services provided by Helicopter EMS providers. Some HEMS programs can accommodate two patients in the same aircraft, carry specialty medical devices (i.e. Intra-Aortic Balloon Pumps, Premature Infant Isolettes, etc.), and perform advanced procedures such as trans-venous cardiac pacing. Some HEMS programs perform Instrument Flight Rules (IFR) response, utilize NVG's for nighttime scene operations, are equipped with Forward Looking Infra-Red (FLIR) devices, or perform hoisting operations or other technical rescue procedures (i.e. short line haul).

Based upon these various levels of service and safety equipage, it should be emphasized that the "closest, appropriate helicopter", defined as one with the necessary safety equipment to safely perform the response and transport, and one with the necessary medical personnel / equipment to appropriately meet the needs of the patient, be requested.

Panel 5: Flight Dispatch Procedures

It is the recommendation of the Small Operators Panel that the National Transportation Safety Board consider the following recommendations with respect to Flight Request Centers operating in the HEMS environment.

1. Flight Request Centers should be considered as an essential element in the conduct of HEMS operations.
2. Centers should be staffed with personnel trained and equipped to provide high level information to HEMS pilots, medical team members and referring agencies.
3. Operators conducting HEMS operations must have advanced aviation training programs to educate Request Center personnel with technical knowledge related to weather, basic flight planning, communications, and aircraft performance.
4. Due to the nature of small operations, personnel working in the Flight Request Center must have considerable situational awareness of the HEMS environment that can only be gained through "hands-on" experience as participatory observers.
5. Flight Request Centers must have basic flight following capabilities to include up-to-date and detailed regional maps, aviation sectionals, Airport Directories, local law enforcement agency information, local hospital details and other aids that can be readily accessed.
6. As a "Best Practice" use of automated "flight tracking" program must be encouraged. In a future state, sharing tracking information among competing programs should be encouraged.
7. Flight Request Center personnel must be included in annual Air Medical Resource Management programs and training.
8. Professional courses such as NACS should be encouraged and where feasible attendance at Part 121 type "Dispatcher" courses should be highly recommended.
9. Cooperation and communications among HEMS operators should be encouraged if in proximity to allow Communication Centers to share flight turn down information, flight following overlap, hospital helipad information, weather updates and safety-related or hazard transmission.

10. HEMS programs should share and encourage common traffic communication frequencies to facilitate collision avoidance, as well as standard arrival and departure procedures. These functions should be coordinated through the flight request centers. Use of exclusive frequencies at helipads should be discontinued.
11. In mass casualty or disaster scenarios, Flight Communication Centers should be linked to regional Centers to provide updated information and traffic advisory-like information.
12. The Flight Request Center should be maintained in a sterile environment where outside distractions are minimized.
13. Use of technology such as video feeds should be encouraged to provide live and direct observation of hospital helipads.
14. Regular meetings should be encouraged among all air medical operators serving regional areas. Communications personnel should attend and be active in these meetings.
15. Air Medical operators should be encouraged to share regional Post Accident, Post Incident plans with each other and maintain current drills with each other.

Panel 6: Safety Equipment and Flight Recorders

No single technology is THE answer to the problem we are trying to address. Clearly any and all technologies that can (and do) provide a possible break in the causal chain of events should be integral parts of the overall solution and are critical in the recognition of an actual break in this industry wide accident rate.

Each intervention has its limitations as well as its benefits.

Cockpit voice and video recording technology is of particular importance to the HEMS industry as we strive to improve safety.

Panel 7: Flight Operations Procedures and Training

The most effective solution to the trend of recent EMS helicopter accidents is **instrument proficiency training**. I was seated at the small operators table (CareFlite) and it was interesting to hear the different operator's ideals of what the best preventative measures are. Some cited twin engine IFR while others touted auto pilots or NVG's as the one best fix. Additionally Chairman Sumwalt's view on HTAWS was abundantly clear. The key is sufficient training of the Pilot in Command. Is the pilot in control or command of his aircraft when he enters inadvertent IMC? This leads to a question that I had posed to relevant NTSB staff at the hearings this February. Does Controlled Flight into Terrain (CFIT) need to be redefined? or should the NTSB reclassify CFIT accidents that occur during IIMC? HEMS Operators are now required to use higher weather minimums per the latest FAA order. You can raise minimums

to the stratosphere, however there will always be un-forecast or under-forecast weather that pilots will on occasion have to contend with. There is an ever expanding amount of technology created to aid the pilot, but we cannot overly rely on these technologies or expect them to replace basic pilot skills. Auto pilots for example are a great pilot workload reducer, but if a pilot goes IIMC and his auto pilot is not functioning, does he have the skill and recent training to competently hand fly his aircraft to a successful outcome? This is very likely the highest workload stressful situation a civilian helicopter pilot will encounter in their entire career.

I have been an EMS helicopter pilot for Classic Helicopters dba Classic Lifeguard for nearly 17 of my 25 years in aviation. Classic Lifeguard serves a very large area (4,000sq. miles) in the most remote region of the lower 48 states. It is also some of the most precipitous terrain in the country and due to the mountainous terrain, MEA's begin at 10,000'. When combined with a lack of route structure, weather reporting capabilities and icing potential, one can see that IFR flight is not feasible. During the first 12 years of flying here without NVG's I personally encountered IIMC on 3 separate occasions. I credit my successful recoveries to regular instrument proficiency training. Since operating with NVG's (2004), I have been able to avoid IIMC thus far. Instrument proficiency is a highly perishable skill and needs to be practiced a minimum of every 60 days. We have added recent instrument proficiency training to our HEMS risk assessment. These factors should apply to both VFR and IFR programs alike since IFR programs are actually filing IFR an average of only 10% of the time and actual instrument time is surely less. During our weather season (October - March) Classic EMS pilots are required to perform instrument proficiency training with a safety pilot every 30 days. Training is always conducted at night without autopilot and consists of an instrument take off (which in itself is great training for brownout/whiteout recovery), basic air work (standard rate climbing and descending turns), unusual attitude recovery and 2 non-precision approaches. Both pilots are on goggles but the pilot receiving training has the goggles lowered and turned off. It is imperative that this training be realistic as possible. Where as simulator training is a great tool for the basic skills like developing a proper scan, there is no better training than the actual aircraft cockpit where the pilot has all of his resources available. Also, unless you happen to train in a 3 axis simulator or the actual aircraft, the pilot will not experience the spatial disorientation or need to overcome his "seat of the pants instincts" which is another common thread in many HEMS accidents. The bottom line is we must train for worst case situations.

The National Weather Service should have been present at the NTSB hearing. Weather reporting is another area where improvement is needed. The HEMS tool is certainly a huge improvement, particularly in our area where weather reporting stations can be spaced 150nm apart. The NextGen/ ADS-B system appears to well on the way to being implemented across the country, and that should be another huge improvement. Has the National Weather Service considered satellite based visibility and cloud level measurement which could be utilized anywhere on the continent? I believe the technology does exist.

Also missing from the hearing was ATC. Does ATC receive specific training for handling aircraft that encounter IIMC? And if a pilot encounters IIMC in or near controlled airspace and declares an emergency, will he be violated? (i.e. non-compliance with cloud

clearance requirements) I believe most pilots fear punitive action which can affect their actions. Is this an area where we can effect a change in culture?

Finally, since our company was involved in the mid-air in Flagstaff last June and poor air to air communication was contributory, I offer the following amendments to these venerable aviation catch phrases which could be refreshed in a campaign.

- 1) See and be seen, (add) listen and be heard.
- 2) See and avoid, (change to) Look, Listen and Avoid.

I hope any or all of this can be helpful, for if it will help save just one life, we have done an invaluable service.

Panel 8: Corporate Oversight

As a small operator, CAMTS accreditation is an important external review of our systems of medicine and aviation collectively. The Commission on Accreditation of Medical Transport Services is the only accrediting organization that reviews transport systems including ground, helicopter and fixed-wing services together. Participation in CAMTS accreditation is voluntary and approximately half the HEMS programs in the United States are accredited. As a small operator, a financial reimbursement system through Medicare/Medicaid that encourages participation in CAMTS accreditation or rewards programs that voluntarily comply with accreditation would encourage further participation from the HEMS industry.

Strong corporate oversight is necessary for a successful and safe operation of all HEMS models. Collectively, the small operators have different styles of oversight but each is meeting three similar goals focused around safety, operations and finance. In our organizations, senior leadership establishes the culture of the organization which plays an important role of balancing safety, operations and finance. As a group of small operators, we have established standards and audits to maintain a high level of oversight for our operations and encourage initiatives that challenge our balance of safety, operations and finance.

Panel 9: Safety Management Systems

Safety Management Systems (SMS) is a businesslike approach to safety. It is a systematic, explicit and comprehensive process for managing safety risks. As with all management systems, a safety management system provides for goal setting, planning, and measuring performance. A safety management system is woven into the fabric of an organization. It becomes part of the culture, the way people do their jobs.

Canadian Aviation Regulations specify that SMS is "a documented process for managing risks that integrates operations and technical systems with the management of financial and human resources to ensure aviation safety or the safety of the public".

In practical terms, it requires that the HEMS industry institute policies and systems designed to reduce risk, such as by implementing reporting systems for the reporting and correction of shortcomings. CareFlite supports a change in emphasis from direct operational oversight to oversight of the organizational systems and their effectiveness. This approach puts increased reliance on industry to cultivate a safety culture and in so doing enhance safety.

Panel 10: FAA Principal Inspector Functions

An HEMS POI's role has become a specialized role within the FAA and the air medical community. The number of experienced HEMS rotorcraft inspectors appears to be insufficient due to the total air carrier certificates they are required to manage; leaving them with inadequate time and resources to work with the small HEMS operators in a meaningful way..

Panel 11: FAA Flight Standards National Policy and Regional Implementation

Throughout the four days of hearings, a constant theme was heard from nearly every panel: "There is no silver bullet to fix the accident rate in the air medical industry." There must be a systematic approach by both government (state and federal) and industry that takes into account individual organizational challenges in particular operational areas while ensuring the highest aviation standards are maintained.

The business model of an organization plays a role in a company's solution to the problems faced by the industry. This is not meant to portray one as being better than the any other; it's a business choice that affects operational decisions. Unsuccessful businesses do not remain in business.

It makes business sense for longstanding (30 years) legacy programs like CareFlite, which has restricted itself geographically by choice, to spend the time, effort and money to develop a comprehensive helicopter IFR infrastructure as their solution to CFIT and weather related accidents. This is particularly true in highly complex terminal regions like DFW, southern California, the Bay area, New York and Baltimore/Washington. Other small operators face completely different flight, geographic and weather conditions.

Stand alone operators do not have a vested interest in any location; primarily because they do not know if a particular location will be profitable or require a business decision to relocate. Neither does the hospital contract vendor know if they will maintain any particular contract location past the end of their current agreement. However, there is security in a hospital

contract that increases with a longer term agreement. Both of these models must look to a portable solution to address the issues because of the possibility that a particular base may be closed for a variety of reasons.

The challenge ahead is to raise and maintain our national standards without imposing rules that do not meet the most important safety needs of a particular operator in a specific operating environment.

Panel 12: FAA Aviation Safety Policy

CareFlite supports a change in emphasis from direct operational oversight to oversight of the organizational systems and their effectiveness.

We submit these comments for the Safety Board's consideration on behalf of small HEMS operators across the country listed below our signatures.

Sincerely,

For CareFlite:



James C. Swartz, ATP, CMTE, President / CEO



Raymond K. Dauphinais, ATP, Vice President
and Director of Flight Operations

For Aerocare, Covenant Health System

Andrew Faletto, ATP, Director of Aerocare

For Angel One Transport, Arkansas Children's Hospital:

Mary J. McDaniel, RN, Vice President, Patient
Care Services, Arkansas Children's Hospital
Steve Haemmerle, BS, RRT, NREMT-P, CMTE
Director of Angel One Transport

FOR CALSTAR:

Joseph F. Cook, President / CEO
Louie R. Bell, ATP, Director of Flight Operations

FOR CLASSIC LIFEGUARD:

Matthew J. Stein, Director

FOR HOSPITAL WING:

Allen W. Burnett, Program Director / COO

FOR INTENSIVE AIR / SIOUX VALLEY HOSPITAL:

Kerry Berg, Program Manager

FOR KANSAS LIFE STAR:

Adrian Horne, ATP, Director of Operations

NORTH AIR CARE / NORTH MEMORAL HOSPITAL:

Robert Rishovd, Program Director

FOR SAN ANTONIO AIRLIFE:

Robert W. Hilliard, PhD, President / COO

Submitted electronically to hems@ntsb.gov