

Call to action asks air med operators to voluntarily adopt NTSB recommended practices, training and new equipment

Although FAA issued broad-reaching regulations 2 years ago, more needs to be done to improve HEMS safety.



(Top) Robert Sumwalt addresses media following fatal HEMS crash in 2009 in Georgetown SC. (Right) NTSB investigators examine the wreckage of that accident. Sumwalt is at right wearing the face mask.

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ATP/CFII/FE. Airbus A320, King Air 350, Boeing 737,
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On December 10, 2015, a Bell 407 identified as SkyLife 4 crashed near McFarland CA while operating on a nighttime air ambulance flight. The commercial pilot, flight paramedic, flight nurse, and patient were killed. And 5 nights later, tragedy struck again when another helicopter air ambulance crashed in Arizona's Superstition Mountains, where 2 lives were lost. Having 2 air ambulance crashes so close together in time rekindled the discussion about safety of the helicopter EMS segment of aviation.

Operations involving helicopter emergency medical services (HEMS) play a critically important role in our nation's healthcare system by transporting seriously ill patients and transplant organs to emergency care facilities. Each year, approximately 400,000 patients and organs are safely transported via helicopters. This vital service is credited with saving countless lives each year, but it does so in an environment with higher risks than most

segments of aviation. In addition to time pressures that may exist to transport patients as quickly as possible, FAA has noted additional risk factors when they proposed new helicopter regulations in 2010: "Helicopter air ambulances generally operate at low altitudes and under varied weather conditions. Operations are conducted year-round, in rural and urban settings, in mountainous and non-mountainous terrain, during the day and night, and in IFR and visual meteorological conditions (VMC). Remote-site landings pose additional challenges. These remote sites are often unfamiliar to the pilot and, unlike an airport or heliport, may contain hazards such as trees, buildings, towers, wires, and uneven terrain." When risks are not adequately mitigated, accidents happen. That's when the NTSB steps in. In the past 10 years, the HEMS industry has averaged 1 crash every 40 days.

In 2008 the HEMS industry suffered 12 crashes, including a midair collision. Collectively, these accidents claimed 29 lives. It remains the most deadly year on record for the HEMS industry. In February 2009 NTSB held a 4-day hearing to examine safety issues concerning the HEMS industry. Based on testimony given at the hearing, in addition to findings from other HEMS accidents, NTSB issued 21 safety recommendations. Out of these, 10 were

Photos courtesy NTSB

HEMS accidents per year			
Year	Total accidents	Fatal accidents	Number of fatalities
2006	13	3	5
2007	12	2	7
2008	12*	7	29
2009	9	2	6
2010	12	6	16
2011	3	1	4
2012	7	1	3
2013	9	5	12
2014	8	2	6
2015	7	5	9

* Including a midair collision, there were 13 hull losses in 2008.

Source: NTSB

In the past decade, the US HEMS industry has averaged 1 crash every 40 days. The most deadly year on record for US HEMS operations was 2008. Since then, the numbers have fluctuated. Once fully implemented, FAA’s final rule issued in 2014 should improve safety, but more needs to be done.

issued to FAA. They involved improved pilot training; collection and analysis of flight, weather, and safety data; development of a low-altitude airspace infrastructure; and the use of dual pilots, autopilots, and night vision imaging systems (NVIS). The remaining 11 recommendations were issued to the Department of Health and Human Services’ Centers for Medicare & Medicaid Services, the Federal Interagency Committee on Emergency Medical Services, and 40 public HEMS operators.

FAA helicopter rules

In February 2014, in response to these and other NTSB recommendations, FAA published a broad-reaching set of regulations to strengthen helicopter safety—much of it aimed at the HEMS industry. Once these new rules are fully implemented, all air ambulance operators will be required to be equipped with Helicopter Terrain Awareness and Warning Systems (HTAWS). They must also establish preflight risk analysis programs, establish operations control centers if they operate with 10 or more helicopter air ambulances, and ensure that each of their PICs hold an instrument rating. In addition, they must conduct their flight ops complying with Part 135 weather requirements and flightcrew duty time limitations when medical personnel are on board, and equip their helicopters with flight data monitoring systems. There will be additional flight planning and weather minimums requirements, as well.

Furthermore, any helicopter flight operated under Part 135—not just HEMS flights—must be equipped with radio altimeters. Part 135 pilots must also be trained in dealing with flat light, white-out and brown-out conditions, and they should demonstrate competency in recovery from an inadvertent encounter with instrument meteorological conditions (IMC).

More needs to be done

Despite FAA’s positive actions, several NTSB recommendations that were originally suggested were not implemented. For example, one NTSB recommendation issued in 2009 called for FAA to require HEMS pilots to conduct scenario-based training in simulators or flight training devices (FTD). When issuing that recommendation, NTSB stated to FAA that simulators and FTDs are cheaper to operate than training in the actual helicopter. NTSB also noted that, “Simulators and FTDs are beneficial in several ways. In addition to enabling pilots to train in skills that are too risky to perform in a real helicopter, simulators and FTDs can, unlike real helicopters, be used anytime, day or night, and in any kind of weather. Simulators and FTDs can also allow training for a complete flight, including an emergency.” When FAA proposed a rule without such a requirement, NTSB wrote to FAA and again urged adopting this recommendation. “The increased use of helicopter simulators for helicopter air ambulance pilot training is essential to improving pilot knowledge and skills for inadvertent IMC encounters and other piloting issues, such as emergency procedures.” Because FAA’s final rule did not include such a requirement, NTSB closed this recommendation as “unacceptable action.”

Another requirement not included in the FAA’s final rule was one for night vision imaging systems (NVIS) such as night vision goggles (NVGs). When issuing a recommendation for NVIS in 2009, NTSB noted that several accidents we investigated likely could have been prevented by use of NVIS. Furthermore, FAA’s own analysis of HEMS accidents had similar findings. Of all the initiatives discussed at the NTSB’s 2009 HEMS hearing, requiring the use of NVIS received the strongest consensus. For example, in their joint written submission to the NTSB HEMS



Photo by Stephanie Matonek/NTSB

Emergency medical service helicopters transport thousands of patients in need every year not only in the US but all over the world. Flightcrew members of the 2 Bell 407s in this photo assist ground rescue personnel in evacuating victims of a fatal car accident in the Arizona desert in 2008.

hearing, 3 industry groups—including HAI—noted that “All air medical operations at night [should] be conducted using either NVGs or enhanced vision systems.” Considering evidence that NVIS can be a critical part of a helicopter’s safety equipment by significantly enhancing situational awareness, many in the industry were surprised that FAA’s final rule did not require it. Because lack of positive action on this safety recommendation, NTSB classified this recommendation as “Closed – Unacceptable Action.”

NTSB believes that incorporating a safety management system (SMS) could also improve HEMS safety. Although the FAA’s final rule included some aspects of SMS, NTSB feels that some elements are no substitute for a complete SMS. Absent a rule for complete SMS, NTSB classified this recommendation to FAA in a “Closed – Unacceptable Action” status.

The circumstances of several of the accidents suggest that the presence of 2 pilots might have prevented these accidents. As noted by NTSB, “Conducting flights with 2 pilots allows 1 pilot to fly the airplane while the other communicates on the radio, programs aircraft avionics, and runs checklists.” However, NTSB recognizes that due to space and weigh considerations, configuring an air ambulance helicopter with 2 pilots may not be practical. Therefore, in 2009 NTSB issued a recommendation for FAA to “require helicopters that are used in emergency medical services transportation to be equipped with autopilots and that the pilots be trained to use the autopilot if a 2nd pilot is not available.” Because the FAA did not include this important safety enhancement in the final rule, NTSB also classified this recommendation as “Closed – Unacceptable Action.”

In 2009, as part of our comprehensive set of HEMS-related recommendations to FAA, NTSB recommended that

FAA conduct a systematic evaluation on the requirements necessary for a viable low-altitude airspace infrastructure that can accommodate safe HEMS operations. After more than 5 years of no forward movement on FAA’s part, in early 2015 NTSB voted to classify this recommendation as “Open – Unacceptable Response.”

Call to action

Although FAA is to be applauded for implementing a broad-reaching set of regulations to improve helicopter safety, as evidenced by continued crashes, more needs to be done. NTSB does not dream up and issue safety recommendations based on a whim or theoretical data. Each and every recommendation is the result of fatal crashes. The simple truth is that NTSB recommendations, if implemented, will save lives. Although FAA did not enact the above-cited regulations, I issue a call to action for HEMS operators to voluntarily implement NTSB recommendations that FAA did not. After all, when it comes to safety, it shouldn’t take a government regulation to do the right thing. ✈️



Robert Sumwalt was appointed in 2006 by President George W Bush to serve as a member of NTSB and reappointed in 2011 by President Barack Obama. He served a 2-year term as NTSB vice chairman. He chaired the NTSB’s hearing on HEMS safety in 2009 and has testified to Congress on HEMS safety. He has 32 years of piloting experience, including 24 years as an airline pilot followed by a 2-year stint managing a Fortune 500 corporate flight department.