



Growing accident numbers
prompt a regulatory response.

Triage for HEMS

BY FRANCES FIORINO

Emergency medical services (EMS) aircraft in the United States each year transport about 500,000 seriously ill or injured patients and donor organs to medical facilities. The industry encompasses 1,211 rotary-wing and fixed-wing aircraft, which operate out of 857 bases (Table 1).

The recent poor safety record for helicopter EMS (HEMS) operations has prompted the U.S. Federal Aviation Administration (FAA) to issue a notice of proposed rulemaking (NPRM) that, if finalized, would mandate operational and equipment revisions. FAA Administrator Randy Babbitt says the goal is “to protect passengers, patients, medical and flight crews” (Table 2, p. 46).

The FAA in previous years has taken numerous non-regulatory actions

to address HEMS safety, but in a recent safety review conducted in advance of the NPRM, the agency identified 75 commercial HEMS accidents in the 1994–2008 period that caused 88 fatalities and 29 serious injuries. Further, 127 helicopter air ambulance accidents involving 126 fatalities and 50 serious

injuries occurred between 1992 and 2009 — a period in which the industry underwent strong growth (Table 3, p. 46). The U.S. National Transportation Safety Board (NTSB) in October released data showing that U.S.-registered medical helicopters were involved in 188 accidents from March 1990

Growth of U.S. HEMS Services Programs and Fleet, 1980–2010

Year	Number of Service Providers	Number of Helicopters	Number of Patients Transported/Year
1980	32	39	17,000
1990	174	231	160,000
2000	231	400	203,000
2005	272	753 rotor 150 fixed wing	500,000 average
2010	373	900 rotor 311 fixed wing	

Source: Association of Air Medical Services (AAMS). 2005 White Paper: Accessing the Future of Health Care; AAMS Atlas & Database of Air Ambulance Services (ADAMS) 2010

Table 1

Summary: Helicopter EMS Safety NPRM

Common causal factors	Controlled flight into terrain, loss of control, inadvertent flight into instrument meteorological conditions, night flying
Proposed risk mitigations	Requirement to install helicopter terrain awareness and warning systems; establishment of operations control centers; conduct flights under FARs Part 135 when medical personnel are aboard
Estimated cost to industry	\$225 million over 10-year period: \$136 million for air ambulance certificate holders, \$89 million for commercial helicopter operators
Estimated benefits	\$83 million – \$1.98 billion over 10-year period
Commentary close date	Jan. 10, 2011

EMS = emergency medical services; FARs = U.S. Federal Aviation Regulations; NPRM = Notice of Proposed Rulemaking

Source: FAA Notice of Proposed Rulemaking FAA-02010-0982, published Oct. 12, 2010

Table 2

U.S. Helicopter Accidents, 1992–2009

	Accidents	Fatalities	Serious Injuries
Air ambulance operators	135	126	29
Commercial helicopters	75	88	50

Source: FAA Notice of Proposed Rulemaking FAA-02010-0982, published Oct. 12, 2010

Table 3

through August 2010. Those accidents resulted in 190 deaths.

The common causes of the crashes — inadvertent flight into instrument meteorological conditions (IMC), controlled flight into terrain (CFIT), loss of control (LOC) and night accidents — are linked by the risks inherent in these time-critical missions: flying at low altitudes into remote, unfamiliar regions over obstacles and rough terrain, often at night, and in bad weather and low-visibility conditions.

The FAA’s NPRM, published Oct. 12, mainly focuses on air ambulance providers but also addresses commercial helicopters operated under U.S. Federal Aviation Regulations Part 135 and Part 91.¹

Many of the NPRM’s provisions are drawn from NTSB recommendations and the FAA’s previous non-regulatory actions. If finalized, the rule would

require air ambulance operators to operate under Part 135 rules whenever medical personnel are aboard, imposing more stringent weather minimums and flight crew rest and duty time requirements. Currently, repositioning flights and flights to an emergency site with medical personnel but without patients may be flown under the general flight rules of Part 91; only flights involving transport of patients are operated under Part 135.

The FAA, noting that this proposed rule could force operators to turn down flights that would meet Part 91 — but not Part 135 — requirements, or cause a flight crewmember to exceed the new flight time limitations, asked for comments about this provision’s impact on the availability of services.

With inadvertent flight into IMC conditions a common factor in accidents, the proposed rule would also

mandate changes in visual flight rules (VFR) and instrument flight rules (IFR) operating procedures for EMS operators. For example, the pilot-in-command would be required to hold a helicopter instrument rating, and operators would have to establish risk-analysis programs and conduct preflight safety briefings, once per shift, for medical personnel assigned to the helicopter base.

The rulemaking, if finalized, would require EMS certificate holders with 10 or more helicopters in service to establish an operations control center staffed with “operations control specialists,” who would work with pilots to mitigate risks and to ensure that the pilots complete a preflight risk analysis worksheet. The FAA wants to know whether this requirement should be based on the size of the operator’s fleet or the number of flights conducted. A January 2009 FAA survey of the agency’s inspectors with oversight of helicopter air ambulance operations indicated that 89 percent of operators voluntarily had established some type of operations control center.

Association of Air Medical Services (AAMS) Executive Director Dawn Mancuso described a typical operations control scenario: If first-responders at the accident site determine that air ambulance transport of the crash victim is desired, they call an operations center, which transmits the request to the pilot. Mancuso says that the pilot is told only the location of a flight, not the condition of the patient(s) in order to remove the pressure to fly regardless of conditions. Only after the pilot makes the go/no-go decision is the medical team informed of the patient’s condition.

Another provision of the NPRM would require air ambulance operators to equip aircraft with helicopter terrain awareness and warning systems

(H-TAWS) within three years of the rule's adoption. The FAA notes that it decided against requiring use of night vision goggles (NVGs), saying that more research is required before naming NVGs as an alternate means of compliance with the H-TAWS rule.

But the FAA's plans are not necessarily what working HEMS pilots are seeking in terms of enhancing safety. Some pilots believe that NVGs provide more significant risk mitigation than H-TAWS. One pilot told *AeroSafety World*, "I do not know of any EMS helicopter pilot who would trade in his or her NVGs for H-TAWS."

The National Emergency Medical Service Pilots Association (NEMSPA) expects to submit its formal position on the NPRM. The pilot group's position paper on NVGs states, "The majority of night flight operations ... are conducted to a significantly higher degree of safety when the pilot is utilizing night vision goggles."

In addition, NEMSPA recently surveyed active HEMS pilots to determine their views on the effectiveness of the FAA's 2009 revision of Operations Specification (OpSpec) A021, a non-regulatory refinement. Among other changes, the OpSpec raised the minimum ceiling and visibility requirements for night HEMS operations.

Rex Alexander, NEMSPA president, said that of the 568 active HEMS pilots participating in the survey, more than 73 percent said NVG equipment should be available for all night VFR operations. About 18.6 percent did not see a need to require the NVG equipment, and 88 percent said the establishment of a minimum required HEMS-specific pilot training curriculum would be an important element in improving safety. When asked to rank five types of equipment important to flight safety, NVGs

ranked first, followed by autopilots. H-TAWS and traffic-alert and collision avoidance system/traffic advisory system tied for third place, and "having a second pilot" came in fifth.

As to equipment, the FAA is seeking comments on a possible future requirement to install lightweight aircraft recording systems (LARSs) on air ambulance helicopters. This move would help NTSB collect data in an accident, as well as facilitate participation in flight operational quality assurance programs. The FAA notes that lightweight LARS units are relatively cheap: \$6,450, plus installation and data-retrieval software.


For all commercial operators flying under Part 135, the NPRM would require that alternate airport IFR ceiling minimums be 200 ft above the published minimum and that visibility be at least 1 mi (1.6 km) for the approach, and never less than the approach's minimum visibility. It would also require operators to equip helicopters with radio altimeters. In addition, all on-demand Part 135 aircraft — not just HEMS aircraft — would be required to prepare a load manifest and transmit a copy of the document to the operations base.

The FAA estimates that complying with the NPRM's provisions in current form would, over a 10-year period, cost operators \$225 million but produce a benefit of \$83 million to \$1.98 billion.

The FAA also notes that such a regulation would have a "significant impact" on a substantial number of small helicopter air ambulance and air tour operators. As of February 2009, the FAA listed 74 helicopter air ambulance certificate holders, 38 of which had five or fewer helicopters in their fleets; 14 had six to 10 aircraft, six operated 11 to 15 helicopters, and 16 flew more than 16 aircraft.

The air medical services industry saw rapid growth in the 1980s and again in the past five years. In 2003, the first year for which data are available, AAMS² members reported that they had 565 helicopters at 72 bases — airports, hospitals and helipads. By 2008, the fleet had increased 24 percent to 699.

AAMS data indicate that industry growth was fueled by changes in the health care system. Insurance and financial pressures led to closures of hospitals and reductions in the number of doctors, particularly in rural areas, where about 60 percent of U.S. auto accidents occur, according to AAMS.³

But industry growth doesn't necessarily mean deteriorating safety levels. The U.S. Government Accountability Office (GAO) report of April 2009⁴ notes that the industry lacks reliable, accurate data about actual flight hours — currently there is no requirement to report hours flown. Without that information, the industry accident rate cannot be accurately calculated, and that rate is a "critical piece of information in determining whether the increased number of accidents reflects industry growth or a declining safety record," the report said, recommending the collection of complete data on air ambulance operations. 

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Notes

1. The FAA NPRM employs the term "air ambulance," while NTSB refers to such operations as HEMS.
2. AAMS. *White Paper 2005: Assessing the Future of Health Care*. 2005.
3. Ibid.
4. GAO. *Aviation Safety: Potential Strategies to Address Air Ambulance Safety Concerns*, GAO-09-627T. April 22, 2009.