

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 1, 91, 120, and 135

[Docket No. FAA- 2010-0982; Notice No. 10-13]

RIN 2120- AJ53

Air Ambulance and Commercial Helicopter Operations, Part 91 Helicopter Operations, and Part 135 Aircraft Operations; Safety Initiatives and Miscellaneous Amendments

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This proposed rule addresses air ambulance and commercial helicopter operations, part 91 helicopter operations, and load manifest requirements for all part 135 aircraft. From 2002 to 2008, there has been an increase in fatal helicopter air ambulance accidents. To address these safety concerns, the FAA is proposing to implement operational procedures and require additional equipment on board helicopter air ambulances. Many of these proposed requirements currently are found in agency guidance publications and would address National Transportation Safety Board (NTSB) safety recommendations. Some of these safety concerns are not unique to the helicopter air ambulance industry and affect all commercial helicopter operations. Accordingly, the FAA also is proposing to amend regulations pertaining to all commercial helicopter operations conducted under part 135 to include equipment requirements, pilot training, and alternate airport weather minima. The changes are intended to provide certificate holders and pilots with additional tools and procedures that will aid in preventing accidents.

DATES: Send your comments on or before [INSERT DATE 90 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments identified by docket number FAA-2010-0982 using any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov> and follow the online instructions for sending your comments electronically.
- Mail: Send comments to Docket Operations, M-30; U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Room W12-140, West Building Ground Floor, Washington, DC 20590-0001.
- Hand Delivery or Courier: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- Fax: Fax comments to Docket Operations at 202-493-2251.

For more information on the rulemaking process, see the SUPPLEMENTARY INFORMATION section of this document.

Privacy: We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. Using the search function of our docket web site, anyone can find and read the electronic form of all comments received into any of our dockets, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the Federal Register published on April 11, 2000 (65 FR 19477-78) or you may visit <http://DocketsInfo.dot.gov>.

Docket: To read background documents or comments received, go to <http://www.regulations.gov> at any time and follow the online instructions for accessing the docket, or, the Docket Operations in Room W12-140 of the West Building Ground Floor at

1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: For technical questions concerning this proposed rule contact Edwin Miller, Flight Standards Service, Part 135 Air Carrier Operations Branch, AFS-250, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267-8166; facsimile (202) 267-5229; e-mail edwin.miller@faa.gov.

For legal questions concerning this proposed rule contact Dean Griffith, Office of the Chief Counsel, AGC-220, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267-3073; facsimile (202) 267-7971; e-mail dean.griffith@faa.gov.

SUPPLEMENTARY INFORMATION:

Later in this preamble under the Additional Information section, we discuss how you can comment on this proposal and how we will handle your comments. Included in this discussion is related information about the docket, privacy, and the handling of proprietary or confidential business information. We also discuss how you can get a copy of related rulemaking documents.

Authority for this Rulemaking

The FAA's authority to issue rules on aviation safety is found in Title 49 of the United States Code. This rulemaking is promulgated under the authority described in 49 U.S.C. 44701(a)(4), which requires the Administrator to promulgate regulations in the interest of safety for the maximum hours or periods of service of airmen and other employees of air carriers, and 49 U.S.C. 44701(a)(5), which requires the Administrator to promulgate regulations and minimum standards for other practices, methods, and procedures necessary for safety in air commerce and national security.

List of Terms and Acronyms Frequently Used in This Document

AC—Advisory Circular
ARC—Aviation Rulemaking Committee
CFIT—Controlled flight into terrain
CVR—Cockpit voice recorder
EMS—Emergency medical service
FDR—Flight data recorder
GPS—Global positioning system
HTAWS—Helicopter Terrain Awareness and Warning System
IFR—Instrument flight rules
IMC—Instrument meteorological conditions
LARS—Light-weight aircraft recording system
NM—Nautical mile
NTSB—National Transportation Safety Board
NVG—Night vision goggles
NVIS—Night-vision imaging system
SAFO—Safety Alert for Operators
TAWS—Terrain Avoidance and Warning System
TSO—Technical Standard Order
VFR—Visual flight rules
VMC—Visual meteorological conditions

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I. Executive Summary

This NPRM proposes requirements for all part 135 aircraft, part 91 helicopter operations, and air ambulance and commercial helicopter operations. The proposal aims to address safety concerns arising from an increase in air ambulance related fatalities from 2002 to 2008.

As described in further detail throughout this document, the NPRM proposes the following requirements:

Affected Entities	Proposal
Part 135 – All Aircraft	<ul style="list-style-type: none"> • Permit operators to transmit a copy of load manifest documentation to their base of operations, in lieu of preparing a duplicate copy. • Specify requirements for retaining a copy of the load manifest in the event that the documentation is destroyed in an aircraft accident.
Part 91 – Helicopter Operations	<ul style="list-style-type: none"> • Revision of part 91 Visual Flight Rules (VFR) weather minimums.
All Commercial Helicopter Operations (Operating Requirements)	<ul style="list-style-type: none"> • Revision of commercial helicopter instrument flight rules (IFR) alternate airport weather minimums. • Require helicopter pilots to demonstrate competency in recovery from inadvertent instrument meteorological conditions. • Require all commercial helicopters to be equipped with radio altimeters. • Change definition of “extended over-water operation,” and require additional equipment for these operations.
Air Ambulance Operations (Operating Requirements and Equipage)	<ul style="list-style-type: none"> • Require air ambulance flights with medical personnel on board to be conducted under part 135, including flight crew time limitation and rest requirements. • Require certificate holders with 10 or more helicopter air ambulances to establish operations control centers. • Require helicopter air ambulance certificate holders to implement pre-flight risk-analysis programs. • Require safety briefings for medical personnel on helicopter air ambulances. • Amend helicopter air ambulance operational requirements to include VFR weather minimums, IFR operations at airports/heliports without weather reporting, procedures for VFR approaches, and VFR flight planning. • Require pilots in command to hold an instrument rating. • Require equipage with Helicopter Terrain Awareness and Warning Systems (HTAWS), and possibly light-weight aircraft recording systems (LARS).

In aggregate, the FAA estimates the mean present value of the total monetizable costs of these proposals (over 10 years, 7% discount rate) to be \$225 million, with a range of total monetizable benefits from \$83 million to \$1.98 billion (over 10 years, 7% discount rate).

The table below summarizes the present value range of total aggregate monetizable costs and benefits the FAA estimates as a result of this rule:

Summary of Monetizable Costs and Benefits ¹	Range (in millions) (over 10 years, 7% discount rate)
Air Ambulance	\$62 to \$1,500
Commercial	\$21 to \$480
Total Benefits	\$83 to \$1,980
Air Ambulance	\$136
Commercial	\$89
Total Costs	\$225

The FAA requests comments on the analysis underlying these estimates, as well as possible approaches to reduce the costs of this rule while maintaining or increasing the benefits. While the FAA has concluded that the aggregate benefits justify the aggregate costs, under some scenarios, the monetizable benefits may fall short of the monetizable costs. The FAA seeks comments on possible changes or flexibilities that might improve the rule.

II. Background

A. Statement of the Problem

The helicopter air ambulance industry experienced a significant increase in fatal accidents in 2008, making it the deadliest year on record for the industry. During that year, six accidents claimed 24 lives, including those of pilots, patients, and medical personnel. In addition, there were three non-fatal accidents in 2008. However, helicopter air accidents were

not confined to 2008. From 1992 through 2009, there were 135 helicopter air ambulance accidents, including one midair collision with another helicopter engaged in an air ambulance operation. These helicopter air ambulance accidents resulted in 126 fatalities. In a 2009 report, the U.S. Government Accountability Office (GAO) recognized that air ambulance accidents reached historic levels from 2003 through 2008.²

Helicopter accidents, however, have not been limited to the air ambulance industry. The FAA identified 75 commercial helicopter accidents, occurring from 1994 through 2008 with causal factors that are addressed in this proposal. These accidents involving commercial helicopter operations resulted in 88 fatalities. These accidents do not include the helicopter air ambulance accidents discussed above.

After reviewing the accident data, the FAA identified controlled flight into terrain (CFIT), loss of control (LOC), inadvertent flight into instrument meteorological conditions (IMC), and accidents during night conditions as four common factors in helicopter air ambulance accidents. A review of commercial helicopter accidents also demonstrated that these accidents may have been prevented if pilots and helicopters were better equipped for encounters with inadvertent flight into IMC, flat-light,³ whiteout,⁴ and brownout⁵ conditions, and for flights over water. The FAA also determined that enhancements to safety equipment for over-water

¹ “Air ambulance” applies to helicopter air ambulance operations. “Commercial” applies to all part 135 aircraft operations, excluding helicopter air ambulance operations.

² GAO, *Aviation Safety: Potential Strategies to Address Air Ambulance Safety Concerns* (2009).

³ The NTSB describes flat-light conditions in NTSB Safety Recommendation A-02-33 as “the diffuse lighting that occurs under cloudy skies especially when the ground is snow covered. Under flat light conditions, there are no shadows cast, and the topography of snow-covered surfaces is impossible to judge. Flat light greatly impairs a pilot’s ability to perceive depth, distance, altitude, or topographical features when operating under visual flight rules (VFR).”

⁴ AC 00-6A, *Aviation Weather for Pilots and Flight Operations Personnel*, describes whiteout conditions as a “visibility restricting phenomenon that occurs in the Arctic when a layer of cloudiness of uniform thickness overlies a snow or ice-covered surface. Parallel rays of the sun are broken up and diffused when passing through the cloud layer so that they strike the snow surface from many angles. The diffused light then reflects back and forth countless times between the snow and the cloud eliminating all shadows. The result is a loss of depth perception.”

⁵ Brownout conditions occur when sand or other particles restrict visibility and depth perception.

operations and establishing more stringent instrument flight rules (IFR) alternate airport weather minima would enhance the safety of all part 135 helicopter operations.

Prior to developing this proposed rule, the FAA undertook initiatives to address the common factors that contribute to helicopter air ambulance accidents including issuing notices, handbook bulletins, operations specifications, and advisory circulars (ACs); this proposed rule would codify many of these initiatives.

Additionally, this proposal addresses National Transportation Safety Board (NTSB) safety recommendations and recommendations made by the Part 125/135 Aviation Rulemaking Committee (ARC) concerning helicopter air ambulance and commercial helicopter operations. This includes a proposal to adopt amendments to load manifest requirements for single-engine part 135 operations, consistent with an NTSB Safety Recommendation developed in response to a 1997 accident.

B. Helicopter Air Ambulance Operations

The helicopter air ambulance industry is relatively young but has experienced rapid growth during its existence. The industry's evolution has not produced a uniform model of operations; rather certificate holders vary in size and scope of operations. In addition, as discussed below, helicopter air ambulance operations present unique challenges meriting regulation beyond that traditionally applied to part 135 commercial helicopter operations.

Helicopter air medical transportation was first used prominently during the Korean War to move injured soldiers from the battlefield. Since then, helicopters have been used to transport critically injured patients and donor organs to hospitals because of their capability to provide rapid transportation over long distances from remote locations. The first commercial helicopter air ambulance program began operation in 1972. The industry grew significantly in the 1980s,

and is continuing to grow.⁶ Between 2003 and 2008, the Association of Air Medical Services reported a 54 percent increase in the number of helicopters used by its members in helicopter air ambulance operations.⁷ The NTSB estimates that 400,000 patients and transplant organs are now transported by helicopter each year.⁸

As of February 2009, the FAA authorized 74 certificate holders to conduct helicopter air ambulance operations. These certificate holders operate approximately 850 helicopters in air ambulance operations. The size of these operations varies greatly. The smallest operators only have one or two helicopters and operate in one region; the largest operators may have hundreds of helicopters across the United States. Of the 50 largest certificate holders operating under part 121 or 135, as measured by the number of aircraft operated, six conduct helicopter air ambulance operations. The tenth largest air carrier in the United States, Air Methods Corporation, is a helicopter air ambulance operator.

The following is a breakdown of the number of helicopter air ambulances operated by the 74 certificate holders permitted to conduct helicopter air ambulance operations as of February, 2009: 38 certificate holders have 5 or fewer helicopters; 14 certificate holders have 6 to 10 helicopters; 6 certificate holders have 11 to 15 helicopters; and 16 certificate holders have more than 16 helicopters.

Certificate holders' air ambulance programs and operational practices vary as to whether they conduct IFR or VFR operations, perform formal pre-flight risk analyses, or use operations control centers. In addition, certificate holders equip their helicopters differently. For example,

⁶ National Transportation Safety Board: Safety Study--*Commercial Emergency Medical Service Helicopter Operations*, NTSB/SS-88/01 (Jan. 28, 1988), available at <http://www.nts.gov/Dockets/Aviation/DCA09SH001/410702.pdf>.

⁷ See GAO, *Aviation Safety: Potential Strategies to Address Air Ambulance Safety Concerns* 4 (2009).

⁸ Testimony of the Hon. Robert L. Sumwalt, III, Board Member NTSB, Before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, April 22, 2009, available at <http://transportation.house.gov/hearings/hearingDetail.aspx?NewsID=865>; transcript URL: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_house_hearings&docid=f:49001.pdf

some helicopters are permanently configured for full-time air ambulance operations while others are not; some are equipped for IFR operations while others are equipped for VFR-only operations; and helicopter air ambulances have varying situational-awareness technology (such as night vision goggles, HTAWS, radio altimeters, etc.) on board.

Helicopter air ambulance operations present several unique operating characteristics that make them distinct from other types of part 135 helicopter operations. Such operations are often time-sensitive and crucial to getting a critically ill or injured patient to a medical facility as efficiently as possible, which may influence flight crews to fly under circumstances that they otherwise would not. In addition, these operations often are conducted under challenging conditions. For example, helicopter air ambulances operate generally 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 at night, and in IFR and visual meteorological conditions (VMC). Remote-site landings pose additional challenges. These remote sites are often unfamiliar to a pilot and, unlike an airport or heliport, may contain hazards such as trees, buildings, towers, wires, and uneven terrain. Additionally, in an emergency, patients cannot choose which operator provides transportation, and because of their injuries, may not be able to participate in the decision to use helicopter transport. These patients are often transported by the first company to accept the flight assignment from an emergency medical service dispatcher. The FAA believes that these individuals should therefore be afforded the protection of an enhanced regulation for helicopter air ambulances.

As described in the section below, the FAA has taken steps through non-regulatory means to improve helicopter air ambulance safety; however, in consideration of the industry's accident history, characteristics unique to helicopter air ambulance operations, and the lack of

standardization among certificate holders' practices, the FAA believes that additional regulations are necessary to ensure the safety of these flights.

C. FAA Actions

In response to the increasing number of accidents involving helicopter air ambulances, the FAA has developed standards over the years for weather minima and for helicopter terrain awareness and warning systems (HTAWS), and formalized dispatch procedures. In addition, the FAA has issued guidance for operational improvements in areas that address Crew Resource Management (CRM), CFIT, inadvertent flight into IMC, operational control, improved access to weather information, risk management, improvement of organizational safety culture, and aeronautical decision making skills. The following provides a summary of many of the actions taken by the FAA.

On April 8, 2003, the FAA formed the Part 125/135 ARC to perform a comprehensive review of parts 125 and 135 and provide recommendations on rule changes. ARC members included aviation associations, industry representatives, employee groups, the FAA, and other participants to obtain a balance of views, interests, and expertise. The ARC made recommendations pertaining to helicopter air ambulance operations and other commercial helicopter operations that form the basis of several of the proposals in this NPRM, including equipping helicopters with radio altimeters, increasing weather minima for helicopter air ambulance operations, requiring additional safety equipment for over-water operations, requiring pilot testing on recovery from inadvertent flight into IMC, and revising IFR alternate airport weather requirements.

In August 2004, the FAA established a task force to review and guide government and industry efforts to reduce helicopter air ambulance accidents. The task force review of

commercial helicopter air ambulance accidents for the period of January 1998 through December 2004 revealed that CFIT, night operations, and inadvertent flight into IMC were the predominant factors contributing to those accidents.

On January 28, 2005, the FAA issued Notice 8000.293, *Helicopter Emergency Medical Services Operations*, addressing CRM, adherence to procedures, and pilot decision-making skills in helicopter air ambulance operations. This notice was later incorporated into Safety Alert for Operators (SAFO) 06001, *Helicopter Emergency Medical Services (HEMS) Operations* (Jan. 28, 2006). On August 1, 2005, the FAA issued Notice 8000.301, *Operational Risk Assessment Programs for Helicopter Emergency Medical Services*, providing guidance on operational risk assessment programs, including training of flightcrews and medical personnel.

In AC 00–64, *Air Medical Resource Management*, issued September 22, 2005, the FAA recommended minimum guidelines for air medical resource management training for all air medical service operations team members, including pilots, maintenance personnel, medical personnel, communications specialists, and other air medical team members. In Notice 8000.307, *Special Emphasis Inspection Program For Helicopter Emergency Medical Services*, issued September 27, 2005, the FAA addressed a special emphasis inspection program for helicopter air ambulance operators, focusing on operational control, risk assessment, and training programs. On January 24, 2006, the FAA issued handbook bulletin HBAT 06–02, *Helicopter Emergency Services (HEMS) Loss of Control (LOC) and Controlled Flight into Terrain (CFIT) Accident Avoidance Programs*, to FAA inspectors describing acceptable models for LOC and CFIT accident avoidance programs.

In January 2006, the FAA amended Operations Specification A021, which is issued to all certificate holders conducting helicopter air ambulance operations, to establish VFR weather requirements, including consideration of adverse effects of ambient lighting at night and

mountainous terrain. Following the 2008 accidents, the FAA again amended Operations Specification A021 to address VFR weather requirements, applied those weather requirements to all flights with medical personnel on board, required a flight planning requirement, and allowed IFR approaches when a pilot could consult a weather reporting source within 15 miles of the landing location.

In 2006, RTCA, Inc.,⁹ at the FAA's request, established a special committee to develop HTAWS standards. In December 2008, the FAA issued Technical Standard Order (TSO)-C194, *Helicopter Terrain Awareness and Warning System (HTAWS)*, based on the minimum operational performance standards developed by the committee. This TSO establishes the technical baseline for the HTAWS requirement in this proposal.

The FAA issued AC 120-96, *Integration of Operations Control Centers into Helicopter Emergency Medical Services Operations* (May 5, 2008), that provides guidance to certificate holders for establishing operations control and dispatch centers. The information in AC 120-96 formed the foundation of this proposal's requirement for certain certificate holders to establish operations control centers.

In 2008, through Notice 8900.57, *Part 135 Helicopter Training Program and Manual Revisions*, the FAA implemented several pilot training program revisions applicable to part 135 helicopter training programs in response to NTSB safety recommendations A-02-34 and A-02-35, including procedures for mitigating and recovering from brownout, whiteout, and flat-light conditions.

On January 12, 2009, through Notice 8900.63, *Validation of HEMS Safety Initiatives*, the FAA, in an effort to identify how well its voluntary programs had been accepted, surveyed the

⁹ RTCA, Inc. is a private, not-for-profit corporation that develops consensus-based recommendations regarding communications, navigation, surveillance, and air traffic management (CNS/ATM) system issues. RTCA, Inc. functions as a Federal Advisory Committee.

operators through their Principal Operations Inspectors. Survey results indicated that 94 percent of the operators had established risk-assessment programs, 89 percent had training in LOC and CFIT, 89 percent were using operations control centers, 41 percent were using terrain awareness and warning systems (TAWS), 11 percent were using flight data recorders (FDR), and 94 percent were using radio altimeters.

D. National Transportation Safety Board (NTSB) Safety Recommendations

In 1988, the NTSB conducted a safety study of emergency medical service operations that examined 59 accidents.¹⁰ This study determined that the helicopter air ambulance accident rate was almost twice the estimated accident rate of non-scheduled part 135 helicopter air taxi operations, and were 3.5 times more likely to be fatal.¹¹ The NTSB found reduced visibility to be the most common factor associated with such crashes.

In January 2006, the NTSB conducted a special investigation of emergency medical services operations and issued four recommendations to the FAA.¹² These recommendations are discussed in sections III.A.1.a., III.A.1.b., III.A.1.d., III.A.2.a., and III.A.3.b.

In February 2009, the NTSB held a public hearing on “Helicopter Emergency Medical Services” to examine the safety issues associated with these operations and gather testimony from government, operators, industry associations, manufacturers, and hospitals.¹³ In September 2009, the NTSB issued a series of safety recommendations based on the findings of the February hearing. The recommendations that are addressed by this rulemaking are discussed in sections

¹⁰ Commercial Emergency Medical Service Helicopter Operations, Safety Study NTSB/SS-88/01 (Washington, DC: National Transportation Safety Board, 1988).

¹¹ *Id.* at 7.

¹² NTSB, *Special Investigation Report on Emergency Medical Services Operations* (NTSB/SIR-06/01) (Jan. 25, 2006).

¹³ NTSB, Public Hearing Summary, available at http://www.nts.gov/Events/Hearing-HEMS/HEMS_Summary.pdf.

III.A.1.b., III.A.1.d., III.A.2.b., and III.B.3. The FAA has determined that the remaining September 2009 recommendations are not ready for rulemaking at this time.

The NTSB also made recommendations to public aircraft operators, the Federal Interagency Emergency Medical Services Committee, and the U.S. Department of Health and Human Services' Centers for Medicare & Medicaid Services.

As a result of its investigations and studies, the NTSB identified several probable causes of helicopter accidents, such as spatial disorientation, lack of general awareness, loss of control, poor decision making, failure to maintain clearance of obstacles, inadequate planning, and improper execution of standard operating procedures.

NTSB safety recommendations addressed by this rulemaking include the following:

Recommendations on Helicopter Air Ambulance Operations

A-06-12: Recommends that the FAA require all emergency medical services operators to comply with 14 CFR part 135 operations specifications during the conduct of all flights with medical personnel on board. (Discussed in sections III.A.1.a. and III.A.3.b.)

A-06-13: Recommends that the FAA require all emergency medical services operators to develop and implement flight-risk evaluation programs that include training all employees involved in the operation, procedures that support the systematic evaluation of flight risks, and consultation with others in emergency medical service (EMS) flight operations if the risks reach a predefined level. (Discussed in section III.A.1.d.)

A-06-14: Recommends that the FAA require emergency medical services operators to use formalized dispatch and flight-monitoring procedures that include up-to-date weather information and assistance in flight risk assessment decisions. (Discussed in section III.A.1.b.)

A-06-15: Recommends that the FAA require emergency medical services operators to install terrain awareness and warning systems on their aircraft and to provide adequate training to ensure that flight crews are capable of using the systems to safely conduct EMS operations.

(Discussed in section III.A.2.a.)

A-09-87: Recommends that the FAA develop criteria for scenario-based helicopter emergency medical services pilot training that includes inadvertent flight into instrument meteorological conditions and hazards unique to helicopter emergency medical services (HEMS) operations, and determine how frequently this training is required to ensure proficiency.

(Discussed in section III.B.3.)

A-09-89: Recommends that the FAA require helicopter air ambulance operators implement a safety management system program that includes sound risk management practices.

(Discussed in sections III.A.1.b., III.A.1.d, and III.A.2.b.)

A-09-90: Recommends that the FAA require helicopter air ambulance operators install flight data recording devices and establish a structured flight data monitoring program that reviews all available data sources to identify deviations from established norms and procedures and other potential safety issues. (Discussed in section III.A.2.b.)

The FAA notes that the NTSB used the term “emergency medical services operators” or “EMS operators” in its recommendations. However, the FAA uses the term “helicopter air ambulance operators” in this proposed rulemaking. The FAA also notes that NTSB Safety Recommendations A-06-12 through A-06-14 addressed both fixed-wing and helicopter air ambulance operations. As previously noted, while some provisions of the proposal extend to other types of aircraft and commercial helicopter operations more broadly, the FAA is focusing largely on helicopter air ambulance safety in this rulemaking. Although this proposed rule

primarily focuses on helicopter air ambulance safety, it also addresses additional NTSB recommendations, listed below.

Recommendations on Commercial Helicopter Operations

A-02-33: Recommends that the FAA require all helicopter pilots who conduct commercial, passenger-carrying flights in areas where flat-light or whiteout conditions routinely occur to possess a helicopter-specific instrument rating and to demonstrate their competency during initial and recurrent 14 CFR 135.293 evaluation check rides. (Discussed in section III.B.3.)

A-02-34: Recommends that the FAA require all commercial helicopter operators conducting passenger-carrying flights in areas where flat-light or whiteout conditions routinely occur to include safe practices for operating in flat-light or whiteout conditions in their approved training programs. (Discussed in section III.B.3.)

A-02-35: Recommends that the FAA require the installation of radio altimeters in all helicopters conducting commercial, passenger-carrying operations in areas where flat-light or whiteout conditions routinely occur. (Discussed in section III.B.2.a.)

A-06-17: Recommends that the FAA require all rotorcraft operating under [14 CFR] parts 91 and 135 with a transport-category certification to be equipped with a cockpit voice recorder (CVR) and flight data recorder (FDR). (Discussed in section III.A.2.b.)

A-07-87: Recommends that the FAA require all existing and new turbine-powered helicopters operating in the Gulf of Mexico and certificated with five or more seats to be equipped with externally mounted life rafts large enough to accommodate all occupants. (Discussed in section III.B.2.b.)

A-07-88: Recommends that the FAA require all offshore helicopter operators in the Gulf of Mexico provide their flight crews with personal flotation devices equipped with a waterproof, global-positioning-system-enabled 406 megahertz personal locator beacon, as well as one other signaling device, such as a signaling mirror or strobe light. (Discussed in section III.B.2.b.)

Other Recommendations

A-99-61: Recommends that the FAA amend recordkeeping requirements in §135.63(c) to apply to single-engine as well as multiengine aircraft. (Discussed in section III.C.2.)

E. Congressional Action

Legislation has been introduced in both the House of Representatives and the Senate in the 111th Congress, and in earlier Congresses, addressing several of the issues raised in this rulemaking. In addition, on April 22, 2009, the House Transportation and Infrastructure's Subcommittee on Aviation held a hearing on oversight of helicopter medical services. The Subcommittee heard from a variety of government, industry, and public representatives who testified on the House helicopter air ambulance safety legislation, NTSB safety recommendations, and FAA actions to mitigate helicopter air ambulance accidents.

III. Discussion of the Proposal

In determining how to improve the safety of helicopter air ambulance operations, as well as all other commercial helicopter operations, the FAA reviewed approximately 4,000 accidents that involved helicopters in the United States (excluding U.S. territories). Of those accidents, the FAA identified 75 commercial helicopter accidents and 127 helicopter air ambulance accidents

that occurred between 1994 and 2008 with causal factors that are addressed in this proposal. The accidents involving commercial helicopter operations resulted in 88 fatalities, 29 serious injuries, and 42 minor injuries; 28 (approximately 37 percent) involved one or more fatalities, and 47 had no fatalities. The accidents involving helicopter air ambulance operations resulted in 126 fatalities, 50 serious injuries, and 42 minor injuries; 46 (approximately 36 percent) involved one or more fatalities, and 81 had no fatalities. In addition to injuries and fatalities, there also was significant damage or complete hull loss for these accidents.

A comparison of the accidents that occurred between 2000 and 2008 reveals that there were 66 commercial helicopter accidents (including 23 fatal accidents resulting in 65 fatalities) and 98 helicopter air ambulance accidents (including 35 fatal accidents resulting in 94 fatalities) during that time. The percentage of fatalities between the two categories was essentially the same. Given the equivalent risk of fatality if involved in an accident, the FAA has determined that it must focus its efforts on reducing the higher risk of helicopter air ambulances being involved in an accident in the first place.

This proposal, if adopted, would implement new regulations, and revise existing regulations, to address the causes and factors of commercial and helicopter air ambulance accidents identified by the FAA and the NTSB. The FAA notes that compliance dates of the proposed regulations would vary, as noted in discussions below. The FAA believes that many of the accidents reviewed could have been prevented if these proposals had been in place during this 19-year period.

The FAA has also determined that the safety of commercial air operations could be enhanced by requiring a load manifest for all part 135 operations and is proposing to amend its rules accordingly.

A. Helicopter Air Ambulance Operations

The following provisions would apply to all helicopter air ambulance operations, conducted under part 135. These proposals include new operational and equipment requirements for these certificate holders. This rule does not address fixed-wing air ambulance operations. The FAA chose to focus on helicopter air ambulance operations because a predominance of the accidents involved helicopter air ambulances,¹⁴ and approximately 74 percent of the air ambulance fleet is composed of helicopters.¹⁵

1. Operational Procedures

a. Part 135 applicability (§135.1)

The FAA is proposing to amend §135.1 to require that all helicopter air ambulance operations with medical personnel on board be conducted under the operating rules of part 135. This includes instances where the medical personnel are employees of the operator. The safety of helicopter air ambulance flights, including the welfare of the medical personnel and patients on those flights, would be increased if operators were required to comply with the more stringent part 135 rules.

Helicopter air ambulance operations generally consist of two- or three-leg flights. Currently, the non-patient-carrying legs of those operations may be conducted under part 91 because certificate holders consider medical personnel on board the aircraft to be crewmembers and the non-patient transport legs to be positioning flights. This approach is consistent with current FAA guidance to inspectors, which notes that if medical personnel are crewmembers, they are not considered passengers, and that flights with only crewmembers on board may be conducted under part 91.¹⁶

¹⁴ 41 of the 55 air ambulance accidents highlighted by the NTSB in its 2006 Special Investigatoin Report involved helicopters. See NTSB, *Special Investigation Report on Emergency Medical Services Operations*, App'x B (2006).

¹⁵ See GAO, *Aviation Safety: Potential Strategies to Address Air Ambulance Safety Concerns* 1 (2009).

¹⁶ Order 8900.1, vol. 4, chapter 5, section 4.

However, the FAA notes that the primary purpose of having medical personnel on board helicopter air ambulance flights is to provide medical care to the patients being transported, and they “cannot be expected to meaningfully participate in the decision-making process to enhance flight safety or to significantly contribute to operational control of the flight.”¹⁷ Accordingly, the FAA believes these individuals should be afforded the same safety protections of part 135 as those given to patients on board helicopter air ambulance flights.

Air ambulance accidents have occurred during all phases of flight. The NTSB found that 35 of the 55 accidents it studied for its Special Investigation Report occurred during part 91 operations with medical personnel, but no patient, on board.¹⁸ The NTSB cited two examples of fatal accidents that may have been prevented if the operations had been conducted according to the weather minima contained in the part 135 operations specifications issued to certificate holders conducting helicopter air ambulance operations in effect at the time of the investigation. The first accident, which took place in Salt Lake City, UT, in 2003, involved a helicopter air ambulance that crashed into terrain when weather conditions were below part 135 minima. The other accident occurred in Redwood Valley, CA, when a helicopter air ambulance crashed into mountainous terrain during high winds and heavy rain. The NTSB concluded that air ambulance operations would be improved if required to operate under the part 135 operating rules and that the minimal contribution of medical personnel to the safe operation of air ambulance flights is not sufficient to justify operating under the less-stringent part 91 requirements. Those accidents formed the basis for the NTSB Safety Recommendation A-06-12 that the FAA should require all air ambulance operators to comply with part 135 operations specifications while conducting flights with medical personnel on board. This proposal would implement that recommendation for helicopter air ambulance operators.

¹⁷ NTSB, *Special Investigation Report on Emergency Medical Services Operations* (2006).

The major differences between operations conducted under part 91 and part 135 are the applicable weather minima and flightcrew rest requirements. The FAA acknowledges that these more stringent requirements may result in operators turning down air ambulance flights that would meet part 91 weather requirements but not part 135 weather requirements, or if the flight would put a flightcrew member over the maximum daily hours of flight time. Helicopter air ambulance operations are a form of air transportation, and the improvements in air transportation safety that would result from this proposal justifies the more stringent part 135 requirement. This proposal should not require helicopter air ambulance certificate holders to make major operational changes because their operations generally include a part 135 leg on each flight. Nevertheless, the FAA calls for comments on measures that it could take to address this proposed rule's impact on the availability of air ambulance services.

The FAA is proposing in §135.601 to define the term “helicopter air ambulance operation” to clarify that helicopter air ambulance operations include more than just patient-transport legs. The definition would establish that any flight, including a positioning or repositioning flight, conducted for the purpose of transportation of patients or donor organs is a helicopter air ambulance flight, and clarify, through a non-exclusive list, the types of operations considered to be helicopter air ambulance operations. For example, a flight initiated for patient transport but terminated before patient pick up would be considered a helicopter air ambulance operation. However, maintenance, service flights for refueling, or training flights could still be conducted under part 91 when no medical personnel are on board.

The FAA also is proposing to define the term “medical personnel” in §135.601 with language based on that found in AC 135-14A, with modifications. Unlike AC 135-14A, the proposed definition does not address the types of duties performed by medical personnel on the

¹⁸ NTSB, *Special Investigation Report on Emergency Medical Services Operations* (2006).

helicopter other than providing medical care. The proposal would not preclude medical personnel from participating in or assisting the pilot with certain duties (for example, reading checklists, tuning radios, and securing doors) as long as the individuals have been trained by the certificate holder in accordance with its FAA-approved training program. Additionally, the FAA notes that such medical personnel would not be considered to be performing safety-sensitive functions under 14 CFR part 120 *Industry Drug and Alcohol Testing Program*, and would therefore not be required to undergo drug testing.

Certificate holders would be required to comply with this provision by the effective date of the final rule.

b. Operations Control Centers (§135.617)

The FAA is proposing to add §135.617 to require certificate holders with 10 or more helicopters engaged in helicopter air ambulance operations to establish operations control centers. Certificate holders would be required to staff these operations control centers with operations control specialists trained and equipped to communicate with pilots, advise pilots of weather conditions, and monitor the progress of each flight. Each certificate holder covered by this requirement would be responsible for establishing its own individual operations control center. Each certificate holder would be required to provide enough operations control specialists at each operations control center to ensure proper operational control of each flight.

FAA regulations currently do not require helicopter air ambulance operators to have an operations control center. In 2008, the FAA issued AC 120–96, which provides recommendations to assist helicopter air ambulance operators with the development, implementation, and integration of an operations control center, and enhanced operational control procedures similar to those found in part 121. Members of the helicopter air ambulance

industry have noted that the AC is a “product of a survey of best practices in the air medical industry and gives guidance to other air medical services as to the benefits of this type of operation.”¹⁹ In developing this proposal, the FAA sought to standardize operations control centers by codifying the concepts of AC 120–96 into a framework appropriate for helicopter air ambulance operations. The FAA notes that a January 2009 FAA survey of inspectors with oversight of helicopter air ambulance operations showed that 89 percent of helicopter air ambulance operators have voluntarily established some type of operations control center.

The NTSB, in its 2006 *Special Investigation Report on Emergency Medical Services Operations*, identified the following four fatal accidents, which may have been prevented if formalized dispatch and flight-monitoring procedures had been in place.²⁰

(1) In a 2004 Pyote, TX, accident in which a helicopter air ambulance transporting a patient crashed into terrain while maneuvering in reduced-visibility conditions, the pilot was not aware of expected thunderstorm activity in the area because he did not obtain a weather briefing before departure.

(2) In the 2003 Salt Lake City, UT, accident in which a helicopter air ambulance crashed into terrain when weather conditions were below part 135 minima, the operator’s dispatcher encouraged the pilot to accept the flight in spite of the fact that another company had refused it because of low visibility conditions. The NTSB stated that a flight dispatcher with specific knowledge of flight requirements would likely have been able to more fully comprehend the importance of the other company’s refusal, independently gathered and correctly interpreted

¹⁹ Statement from the Association of Air Medical Services, Helicopter Association International, and Air Medical Operators Association to the NTSB 14 (Jan. 13, 2009), available at <http://www.nts.gov/Dockets/Aviation/DCA09SH001/default.htm>.

²⁰ NTSB, *Special Investigation Report on Emergency Medical Services Operations* (NTSB/SIR-06/01) 7 (Jan. 25, 2006).

pertinent weather information from all available sources, and provided appropriate advice to the pilot.

(3) In a 2004 accident in Newberry, SC, a helicopter air ambulance collided with trees in poor weather conditions. Three flightcrews had declined the mission based on their awareness of unsafe weather conditions, specifically the presence of fog. A 911 dispatcher that communicated with the pilot did not inform the pilot that the other three flightcrews had declined the mission because of fog.

(4) A helicopter air ambulance that crashed into mountainous terrain in 2004 in Battle Mountain, NV, was not reported overdue until approximately four hours after its departure. The flight crossed from one county to another, and 911 dispatch centers from the two counties were not required to communicate with each other directly. Responsibility for initiating communications when crossing into another county dispatch center was placed on the pilot. Because the aircraft was not reported missing in a timely manner, the opportunity for potentially life-saving search and rescue operations was lost.

The NTSB concluded that “[f]ormalized dispatch and flight-monitoring procedures, including a dedicated dispatcher with aviation-specific knowledge and experience, would enhance the safety of emergency medical services flight operations by providing the pilot with consistent and critical weather information, assisting in go/no go decisions, and monitoring the flight’s position.” This resulted in NTSB Safety Recommendation A-06-14 that air ambulance operators be required to “use formalized dispatch and flight-following procedures that include up-to-date weather information and assistance in flight risk assessment decisions.” This proposal would address that safety recommendation.

This proposed regulation, which would also partially address NTSB Safety Recommendation A-09-89 regarding the implementation of sound risk management practices,

could contribute to a certificate holder's overall safety program because it would be a method of incorporating risk management practices into a company's flight operations. In particular, an operations control specialist would provide additional input on proposed operations and be able to monitor flights, potentially helping pilots avoid dangerous situations.

Under this proposal, operations control specialists would perform the following functions: (1) maintain two-way communications with pilots;²¹ (2) provide pilots with weather information to include current and forecasted weather along the planned route of flight; (3) monitor the flight progress; and (4) participate in pre-flight risk analysis.²² This proposal is intended to provide an additional measure to help prevent CFIT, loss of control, inadvertent flight into IMC, and accidents at night.

The FAA is proposing to require certificate holders with 10 or more air ambulance helicopters to establish operations control centers for several reasons. The FAA's analysis of current helicopter air ambulance operators shows that the vast majority of operations are conducted by operators with these larger fleets. The FAA's review of operations specifications issued to the 74 certificate holders authorized to conduct helicopter air ambulance operations shows that, as of February 2009, there were 24 certificate holders with 10 or more helicopters in their fleets. Those certificate holders operated 620 of the 884 total helicopters in helicopter air ambulance operations. Additionally, the level of operational complexity and management detail required for safe operations is greater for certificate holders with 10 or more helicopter air ambulances.

Although certificate holders with nine or fewer helicopter air ambulances are not covered by this provision, the FAA finds that the pre-flight risk analysis requirement proposed under

²¹ The FAA notes that this proposal is not intended to limit two-way communication between the operations control specialist and the pilot to traditional two-way radio communication. Rather, other means of communication, such as satellite phone or data link, also would be acceptable.

²² See section III.A.1.d. of the preamble to this NPRM.

§135.615 may provide a sufficient alternative for these operators because of their limited scope of operations.²³

The FAA requests comments on whether the requirement should be dependent on fleet size or number of operations conducted. The agency asks that comments be accompanied by data regarding the number of operations conducted by helicopter air ambulances and/or the typical number of hours flown per aircraft.

The FAA is proposing in §135.617 to require the staffing of operations control centers with operations control specialists, rather than certificated aircraft dispatchers.²⁴ The training program associated with FAA-certificated aircraft dispatcher licensing is primarily focused on large, fixed-wing, transport category aircraft operating under part 121. While aspects of this training, such as weather information and radio communication, are relevant to helicopter operations, this proposal is designed to permit certificate holders to create training programs directly applicable to helicopter air ambulance operations. Accordingly, the FAA sought to incorporate the more general elements of part 65-certificated aircraft dispatcher training into the proposed requirements for training operations control specialists. Although the FAA is not proposing to require formal certification of operations control specialists, it may consider formal FAA certification of these individuals in the future if appropriate.

The FAA notes that certificate holders could be subject to enforcement action for using inadequately trained operations control specialists, or may be responsible for errors committed by an operations control specialist. Likewise, an operations control specialist also could be subject to enforcement action or civil penalties if he or she failed a drug test, functioned as an

²³ See section III.A.1.d. of the preamble to this NPRM.

²⁴ Aircraft dispatchers, certificated under part 65, generally are employed by part 121 air carriers and specialize in scheduled air carrier transportation.

operations control specialist without completing training or passing examinations, or verified false entries on a pre-flight analysis worksheet.

Certificate holders may want to hire certificated aircraft dispatchers, or others with general aviation or weather knowledge, to serve as operations control specialists. This proposal would allow a certificate holder to offer individuals with recent, relevant experience an initial training course that features a reduced number of hours of initial training, focusing on the certificate holder-specific training topics addressed below. A reduced training program would be permissible because of the knowledge these individuals have obtained through training for other positions that is applicable to the operations control specialist position. This benefit would be extended to the following persons with specific aviation-related training -- (1) military pilots, flight navigators, and meteorologists; (2) civilian pilots, flight engineers, meteorologists, air traffic controllers, and flight service specialists involved in air carrier operations; and (3) certificated aircraft dispatchers involved in part 121 operations. This provision is similar to 14 CFR 65.57, which permits individuals who have not graduated from an aircraft dispatcher school, but who have relevant aviation experience, to apply for an aircraft dispatcher certificate.

In addition, with respect to the pre-flight risk analysis that would be required under this proposal for all helicopter air ambulance operations,²⁵ the operations control specialist would ensure that the pilot completed the pre-flight risk analysis worksheet, confirm and verify the entries on the worksheet, and work with the pilot to mitigate any identified risk. The operations control specialist, along with the pilot in command, would be required to acknowledge in writing (by signing, initialing, or another method as defined in the certificate holder's operations manual) that the worksheet had been completed accurately. The FAA believes that the operations control specialist's review of the risk assessment will provide an additional measure

²⁵ *Id.*

of safety to helicopter air ambulance flights. By signing the worksheet, the operations control specialist will be indicating that he or she agrees with the level of risk associated with that flight.

Operations control specialists would be performing safety-sensitive functions such as providing pre-flight weather assessment, assisting with fuel planning, alternate airport weather minima, and communicating with pilots regarding operational concerns during flight. These duties are similar to those of an aircraft dispatcher, and therefore, operations control specialists would be subject to the restrictions on drug and alcohol use, and to a certificate holder's drug and alcohol testing program as described in 14 CFR part 120.

To ensure operations control specialists are capable of performing safety-sensitive functions, §135.617 would require certificate holders to establish and implement an FAA-approved initial and recurrent training and testing program for operations control specialists. Operations control specialists would be required to undergo training and testing on-- (1) general aviation topics such as weather, navigation, flight-monitoring procedures, air traffic control procedures, aircraft systems, and aircraft limitations and performance; and (2) topics specific to each certificate holder, such as aviation regulations and operations specifications, crew resource management, and the local flying area. Initial training would address both the general aviation and certificate holder-specific topics. Recurrent training would focus on certificate holder-specific topics. The FAA believes that the certificate holder-specific topics are more likely to change from year to year than the more general topics, justifying a more frequent rate of testing.

An individual would need to receive initial training and pass an FAA-approved written and practical test developed and given by the certificate holder before performing duties as an operations control specialist. An individual would not be able to continue as an operations control specialist unless he or she completed annual recurrent training and passed a written and practical test given by the certificate holder. The certificate holder would be responsible for

maintaining records of the training and tests given to each operations control specialist for the duration of that individual's employment and for 90 days thereafter.

This proposal also would establish daily duty periods for operations control specialists which are based on the part 121 aircraft dispatcher duty time requirement. A certificate holder could schedule an operations control specialist for a maximum of 10 consecutive hours of duty. If an operations control specialist's duty time exceeds 10 hours in a 24-hour period, then the certificate holder would be required to provide at least 8 hours of rest before that individual's next duty period. Such a circumstance may occur if a flight monitored by the operations control specialist is not complete until after the end of his or her scheduled 10-hour duty period. The operations control specialist would be required to remain on duty until each flight he or she is monitoring is complete, until those flights have left the operations control specialist's jurisdiction, or until relieved by another operations control specialist. The certificate holder must provide adequate time at the beginning of a shift to allow the operations control specialist to become familiar with current and expected weather conditions for the area of operations. The certificate holder must also establish a checklist of the subjects to be discussed during shift changes. The checklist should contain subjects such as current and forecasted weather, helicopter maintenance status, helicopter operations in progress, and other relevant information. In addition to duty time limitations, this proposal would require that every 7 consecutive days, an operations control specialist be provided 24 consecutive hours of rest.

This requirement would take effect 2 years after the effective date of the final rule. The FAA believes that this would provide certificate holders with ample time to establish operations control centers, develop training and testing programs, and to hire and provide the estimated 80 hours of training required of operations control specialists.

Although not specifically proposed here, the FAA seeks comment on whether to require operations control specialists to obtain a certificate of demonstrated proficiency from the FAA. The FAA is considering this requirement because it would enable the agency to suspend or revoke an operations control specialist's certificate of demonstrated proficiency, thereby ensuring that person could not continue to hold the operations control specialist position if his or her actions merited such a response. Individuals would not be permitted to serve as an operations control specialist without obtaining a certificate of demonstrated proficiency.

If the FAA were to adopt this approach, the agency anticipates that it would issue a certificate of demonstrated proficiency to an individual upon notification by a certificate holder that the individual has successfully completed the certificate holder's FAA-approved initial training and testing requirements. Anticipating that there may be a period of time between notification and issuance of a certificate of demonstrated proficiency, the FAA would permit a person to serve as an operations control specialist from the date the certificate holder notifies the FAA that the person has met the training and testing requirements.

Certificates of demonstrated proficiency would be valid for the length of time that an operations control specialist works for a certificate holder. If a certificated operations control specialist were to leave one certificate holder to work for another, he or she would need to obtain a new certificate following completion of the new employer's training and testing program.

In the full Regulatory Evaluation in the public docket for this rulemaking, the FAA estimates that the proposed requirement for certificate holders with 10 or more helicopters engaged in helicopter air ambulance operations to establish operations control centers could cost \$97 million or \$60 million present value to implement over 10 years. The FAA specifically requests comments, accompanied by data, on the accuracy of this cost estimate. In addition, the

agency requests comments on how effective this requirement would be in preventing accidents, as well as suggested alternatives for achieving comparable safety benefits.

c. VFR/IFR procedures

The FAA is proposing a series of operational initiatives to increase the safety of helicopter air ambulance operations. Specifically, the FAA is proposing to-- (1) increase VFR weather minima, (2) allow IFR operations at locations without weather reporting, (3) specify procedures for VFR/visual transitions from instrument approaches, and (4) require additional VFR flight planning. These proposals are intended to reduce accidents due to CFIT, obstacle collisions, accidents during night operations, and accidents resulting from inadvertent flight into IMC by prescribing more stringent VFR requirements and providing more opportunity for IFR operations. These rules are proposed only for helicopter air ambulance operations because of the unique environment in which those operations are conducted, including off-airport or heliport landings and potentially time-sensitive operations. The FAA notes that these proposals address recommendations made by the Part 125/135 ARC.

The FAA believes that the following accident is indicative of the type that this section of the proposal is intended to prevent. On January 11, 1998, a Bell 222UT, operating under part 135 with no filed flight plan and originating near Sandy, UT, encountered inadvertent IMC due to extremely poor weather. Shortly after take off, the helicopter collided with mountainous terrain resulting in fatal injuries to all on board. The NTSB cited the cause of the accident as the pilot's failure to "maintain sufficient clearance or altitude from mountainous terrain," and continuing into known adverse weather. NTSB Accident Report FTW98FA093 (Oct. 30, 1998).

The FAA proposes for these provisions to take effect at the effective date of the final rule.

i. Increase VFR weather minima (§135.607)

The FAA is proposing to add §135.607 to prescribe more stringent VFR weather minima for helicopter air ambulance operations in uncontrolled airspace than those currently established in part 135.

Currently, §135.205 requires visibility of at least 1/2 statute mile during the day and 1 statute mile at night for VFR helicopter operations at an altitude of 1,200 feet or less above the surface in Class G airspace. For certificate holders conducting helicopter air ambulance operations, Operations Specification A021 sets forth more stringent weather minima for VFR operations conducted in uncontrolled airspace. This rule would codify the weather requirements of Operations Specification A021.

The NTSB cited in its 2006 Special Investigation Report two examples of fatal accidents that may have been prevented if the operations had been conducted according to the weather minima contained in the part 135 helicopter air ambulance operations specifications in effect at the time of the investigation. The first was the 2003 Salt Lake City, UT, accident in which a helicopter air ambulance crashed into terrain when weather conditions were below part 135 minima. The other accident occurred in Redwood Valley, CA, when a helicopter air ambulance crashed into mountainous terrain during high winds and heavy rain. The Safety Board concluded that EMS operations would be improved if all emergency medical services were operated under part 135. The NTSB subsequently issued Safety Recommendation A-06-12 recommending that the FAA require all emergency medical services operators to comply with part 135 operations specifications while conducting flights with medical personnel on board. This proposal would address that safety recommendation.

The proposed weather minima for uncontrolled airspace are determined by whether the flight is taking place in a mountainous or non-mountainous area, and whether, within those classifications, the flight is taking place in a certificate holder’s local flying area or is a cross-country flight. As defined in proposed §135.601, a local flying area is an area that the certificate holder designates as one in which its pilots are familiar with the terrain and other obstacles. Weather minima are less stringent in local flying areas because of pilots’ increased familiarity with obstacles and the operating environment as compared with other cross-country areas. A local flying area would be limited to a 50-nautical mile (NM) radius because the FAA believes that a pilot would not be able to demonstrate detailed knowledge of hazards such as towers and high-altitude terrain within a larger area. The local flying area definition would codify the language of Operations Specification A021 issued on January 23, 2006.

Table 1 shows the proposed VFR minimum altitudes and visibility requirements.

Table 1. VFR Minimum Altitudes and Visibility Requirements

Location	Weather Minima		
	Day	Night	Night using an Approved NVIS or HTAWS
Nonmountainous local flying areas	800-foot ceiling 2 statute miles visibility	1,000-foot ceiling 3 statute miles visibility	800-foot ceiling 3 statute miles visibility
Nonmountainous cross-country flying areas	800-foot ceiling 3 statute miles visibility	1,000-foot ceiling 5 statute miles visibility	1,000-foot ceiling 3 statute miles visibility
Mountainous local flying areas	800-foot ceiling 3 statute miles visibility	1,500-foot ceiling 3 statute miles visibility	1,000-foot ceiling 3 statute miles visibility
Mountainous cross-country flying areas	1,000-foot ceiling 3 statute miles visibility	1,500-foot ceiling 5 statute miles visibility	1,000-foot ceiling 5 statute miles visibility

In all flying areas, certificate holders conducting operations in a helicopter equipped with an FAA-approved night-vision imaging system (NVIS) or FAA-approved HTAWS could apply lower weather minima during night operations. Those requirements would be less stringent than the basic night operations minima because of the obstacle and CFIT avoidance benefits obtained

from those devices. An approved NVIS would require, at minimum, a night vision goggle (NVG) system as defined in paragraph 1.2 of RTCA/DO-275, *Minimum Operational Performance Standards for Integrated Night Vision Imaging System Equipment*, which states that the NVIS system includes not only the NVGs themselves, but also interior and exterior lighting, windshield and windows, and general crew station design requirements. RTCA/DO-275, paragraph 1.6.1, defines NVGs as binocular systems. Under this proposal the FAA does not intend to change the term “NVIS” to include systems other than NVGs. Therefore, unless equipped with HTAWS, operators using systems that do not meet the definition of “NVIS” would not be permitted to use the NVIS weather minima in §135.607.

Because of the requirement proposed in §135.605 for all helicopter air ambulances to be equipped with HTAWS within 3 years of the effective date of the final rule (discussed in section III.A.2.a.), it is anticipated that all certificate holders would eventually operate under these reduced night operations weather minima. The FAA seeks comment on the interrelationship of these two proposed requirements.

The FAA believes that requiring all VFR legs of a helicopter air ambulance operation to comply with more stringent weather requirements would be an effective method of increasing safety in helicopter air ambulance operations. The FAA does not believe that certificate holders would need to make significant changes to their operations because this proposed rule would incorporate the operating limitations and the weather minima already applicable under Operations Specification A021.

ii. IFR operations at airports and heliports without weather reporting (§135.609)

The FAA is proposing to add §135.609 to allow helicopter air ambulance operators to conduct IFR operations at airports and heliports without a weather reporting facility. Currently,

the regulations only permit IFR operations into and out of airports with an on-site weather reporting source. The proposed rule would allow certificate holders to obtain operations specifications permitting IFR operations into and out of locations without a weather reporting facility if they are able to obtain weather reports from an approved weather reporting facility located within 15 NM of the destination landing area. The FAA believes that this provision would increase the use of IFR by helicopter air ambulance operators and result in more aircraft operating in a positively controlled environment, thereby increasing safety.

The FAA has granted exemptions from these regulations to helicopter air ambulance operators and based this proposal on those exemptions.²⁶ In Exemption No. 9490, the FAA determined it was “safer and in the public interest to conduct operations under IFR rather than VFR particularly in low and marginal weather conditions” because IFR operation is an effective method of countering CFIT accidents. Additionally, this provision would codify a similar provision in Operations Specification A021 issued to helicopter air ambulance operators.

The FAA notes that this proposal would not relieve a pilot from the requirement to assess the landing conditions before descending below the minimum descent altitude set forth in §91.175. To operate in this environment, certificate holders also would be required to implement additional safety measures beyond those otherwise required for IFR flight to ensure the pilot has the appropriate tools to operate the helicopter safely into locations without weather reporting. For example, helicopters used in these operations would have to be equipped with an autopilot and navigation equipment appropriate to the approach to be flown, such as an IFR-certified global positioning system (GPS) or wide area augmentation system (WAAS) receiver. Additionally, to help the pilot ascertain the weather in the aircraft’s vicinity, §135.609 would

²⁶ Exemption Nos. 9490 and 9490B (Regulatory Docket No. FAA–2006–26407); Exemption No. 9665 (Regulatory Docket No. FAA-2008-0169); Exemption No. 6175 (Regulatory Docket No. FAA–2001–9195) (granting authority for departures only); Exemption No. 6175G (Regulatory Docket No. FAA–2001–9195).

require helicopters to be equipped with severe weather detection equipment, such as weather radar or lightning detection equipment. The “navigation equipment appropriate to the approach to be flown” is necessary because, for example, although an ILS approach at the nearby municipal airport may provide the lowest planning minima, if the aircraft is equipped with only a GPS, the lower planning minima of the ILS are unusable.

Section 135.609 not only establishes aircraft equipment requirements to ensure a higher level of safety and to mitigate the associated risk, but also requires certain training of the flightcrew. That training is tailored to the operating environment and the weather observations needed at those locations. These equipment and training requirements are found in the exemptions referenced above. The FAA believes that these additional equipment and training requirements are necessary to compensate for the lack of specific weather information available at the destination.

iii. IFR to VFR/visual transitions (§135.611)

The FAA is proposing to add §135.611 to establish weather minima for transitions to the VFR segment of an instrument approach.²⁷ Pilots conducting an IFR approach would, upon reaching a point in space at a minimum descent altitude, continue the flight to the landing area under VFR if conditions permit. This provision would facilitate operations under IFR with their associated safety benefits.

²⁷ The approaches permitted under IFR PinS Copter Special Instrument Approach Procedures, and IFR Standard and certain Special Instrument Approach Procedures (IAPs) are developed by the FAA using standardized methods associated with the U.S. Standard for Terminal Instrument Procedures (TERPs). IFR Standard and PinS Copter Special Instrument Approach Procedures are publicly available approaches for use by appropriately qualified pilots operating properly equipped and airworthy aircraft. Special IAPs generally service private-use airports or heliports, and the FAA authorizes only certain individual pilots or pilots in individual organizations to use these procedures. Special IAPs may require additional crew training and/or aircraft equipment or performance, and may also require the use of landing aids, communications, or weather services not available for public use. Instrument approach procedures that service private use airports or heliports are generally special IAPs.

Proposed §135.611(a)(1) establishes the requirements for instrument approaches containing the instruction to “proceed visually” from the missed approach point (MAP). For these approaches, the weather minima reflected on the approach chart would apply.

For PinS Copter Special Approaches, proposed 135.611(a)(2) would permit operations under lower weather minima than currently allowed for cruise flight in uncontrolled airspace when transitioning from IFR to a VFR segment on approach. These approaches contain the instruction to “proceed VFR.” The applicable minima are based on the distance from the MAP to the landing area. The pilot would therefore need to evaluate the proximity of the MAP to the landing area to determine the appropriate VFR minima, which are based on the distance from the landing area. Under proposed §135.611(a)(2)(i), the visibility must be at least 1 statute mile if the MAP is within 1 NM of the heliport of intended landing. To make the transition from IFR flight to VFR from a point in space 3 NM or less from the destination, a pilot would need to have 2 statute miles of visibility and a 600-foot ceiling during the day, or 3 statute miles of visibility and a 600-foot ceiling at night in accordance with §135.611(a)(3).

The FAA recognizes that the area between the MAP and the “heliport of intended landing” (i.e. the heliport reflected on the approach chart as no deviation to another location is authorized in this case) has been flight checked but may not meet the requirements to “proceed visually.” The FAA recognizes that obstacles in the vicinity of an instrument approach are flight-checked and marked on instrument approach charts. Approach charts are updated more frequently than the sectional charts used in VFR operations. Therefore, it is less likely that pilots would encounter unexpected obstacles when following an approach documented on an instrument approach chart than when en route using a sectional chart.

The FAA recognizes that a helicopter air ambulance operator may follow a special or standard instrument approach to a heliport or airport to descend below weather and then

transition to VFR flight to land at another location. In that case, the minima of §135.611(a)(3) or §135.611(a)(4) would apply, depending on the distance to the intended landing area, which could be an off-site location.

Lastly, if a pilot transitions from IFR to VFR from a point in space more than 3 NM from the destination, the higher weather minima of proposed §135.607 would apply. The FAA selected 3 NM because that distance is the standard amount of visibility required for VFR operations in controlled airspace in the lower altitudes.

This proposed rule also sets forth standards for pilots departing a destination if they used the provisions of this section to access that location. The same weather minima would apply to the departure if the pilot has filed an IFR flight plan and will obtain IFR clearance within 3 NM of the departure location, and if the pilot departs following an FAA-approved obstacle departure procedure. However it is important to note that a pilot who simply flies the reverse course of the approach used when landing would not be following an FAA-approved obstacle departure procedure, as this procedure has not been flight-checked to specific departure criteria.

The FAA believes that flights conducted under IFR obtain many safety benefits such as obstacle clearance, aircraft separation, and possible weather avoidance, thereby reducing obstacle collisions, CFIT, and wire strikes. The proposed rule would benefit pilots by enabling them to access more destinations by flying within the IFR structure, and then continuing on a VFR segment that has been flight checked for obstacles by the FAA. If the flight can be continued, then the pilot would have the benefit of operating through an area where obstacles have been flight checked and marked by the FAA. If the flight cannot continue under VFR, then the pilot must maintain IFR flight and continue to an alternate destination consistent with current regulations.

This proposal would implement Part 125/135 ARC recommendations. Also, this proposal would codify the provision of Operations Specification A021 regarding weather minima to be used during transitions to VFR flight with changes pertaining to Copter Special Instrument Approaches.

iv. VFR flight planning (§135.613)

The FAA is proposing to add §135.613 to require helicopter air ambulance pilots to perform pre-flight planning to determine the minimum safe altitude along the planned en route phase of flight when conducting VFR operations.

The FAA is proposing to require pilots to evaluate, document, and plan to clear terrain and obstacles along the planned route of flight by no less than 300 feet for day operations, and 500 feet for night operations. The pilot would use this minimum safe cruise altitude when determining the minimum required ceiling and visibility for the planned flight. If the weather minima would not permit VFR flight at the minimum safe cruise altitude, the pilot could either conduct the flight under IFR, or not conduct the flight. Pilots could deviate from the planned flight path if conditions or operational considerations necessitate a deviation. However, during such deviations, the pilot would not be relieved from weather or terrain/obstruction clearance requirements.

If changes to the planned flight occur during flight, the pilot could continue along the new route until reaching his or her destination without re-planning the flight using the requirements of proposed §135.613. However, upon reaching an intermediate stop, the pilot would have to evaluate the new route for terrain and obstacle clearance while the aircraft is on the ground before departure.

This proposal is intended to prevent obstacle collisions by requiring pilots to be aware of the terrain and highest obstacles along a planned route. The proposal would codify a provision of Operations Specification A021, issued to all helicopter air ambulance certificate holders, which requires the identification and documentation of the highest obstacle along the planned route before VFR operations.

d. Pre-flight risk analysis (§135.615)

The FAA is proposing to add §135.615 to require certificate holders to implement pre-flight risk-analysis programs. The FAA believes that pre-flight risk analysis may prevent accidents by mitigating risks before flight. This proposal is intended to provide certificate holders with the means to assess risk and make determinations regarding the flight's safety before launch.

Pre-flight risk assessment has been the subject of FAA guidance, industry best practices, and an NTSB study. On August 1, 2005, the FAA published Notice 8000.301, *Operational Risk Assessment Programs for Helicopter Emergency Medical Services*, which provided guidance to inspectors on risk-assessment programs used in helicopter air ambulance operations. The notice discussed concepts used in a risk management and assessment program, and provided examples of risk variables that a certificate holder could consider in the decision to launch a flight. These variables included weather, flight crewmember performance, operating environment, airworthiness status of the helicopter, and weather. The notice also included several examples of risk-assessment matrices that certificate holders could use in their operations, and included the concept of consulting with management personnel if the risk level reached a certain level. The notice also encouraged pilots to obtain information pertaining to a planned operation from a

number of sources, including mechanics, communications specialists, and flight medical personnel, when determining risks associated with a flight operation.

Notably, a basic concept of a risk assessment program articulated in the notice is the pilot's authority to decline a flight assignment is supreme, while his or her decision to accept a flight is subject to review if risks are identified. The notice stated that once the pilot has declined a flight assignment, other parties, such as a certificate holder's management personnel, should not continue the risk assessment pertaining to that flight in an effort to override the pilot's decision to decline the assignment.

On January 28, 2006, the FAA published SAFO 06001, which recommended that certificate holders apply "safety attributes or risk management/assessment strategies to each flight."

In AC 120-96 (May 5, 2008), the FAA recognized that operations control centers provide improvements in pre-flight risk analysis and conceptualized joint mission responsibility shared by pilots and operations control centers. This AC also provides practical examples of pre-flight risk analyses and how such analyses can be integrated into helicopter air ambulance operations. The AC discusses that operations control specialists may assist helicopter air ambulance pilots by participating in risk analysis, providing supplementary information regarding weather, route information, and landing zones, monitoring flight information such as weather, and monitoring flight progression.²⁸

A January 2009 FAA survey of inspectors with oversight of helicopter air ambulance operations found that 94 percent of helicopter air ambulance operators have some type of decision-making and risk-analysis programs in place. The survey did not reveal the extent of

²⁸ The FAA has issued other ACs relevant to this topic. Advisory Circular 135-14A *Emergency Medical Services/Helicopter (EMS/H)* (June 20, 1991) included guidance on "Judgment and Decisions," and Advisory Circular 120-51E *Crew Resource Management Training* (Jan. 22, 2004) discussed the importance of developing pilot-error management skills and procedures.

these decision-making and risk-analysis programs; however, the FAA believes that the models currently in use incorporate government, industry,²⁹ and military risk-analysis practices as these entities have been the primary entities developing such programs.

The NTSB also has addressed the need for pre-flight risk analysis. In its 2006 *Special Investigation Report on Emergency Medical Services Operations*, the NTSB concluded, based in part on its investigations of three fatal helicopter air ambulance accidents, that the “implementation of flight risk evaluation before each mission would enhance the safety of emergency medical services operations.”³⁰ With regard to the 2003 Salt Lake City, UT, accident in which a helicopter air ambulance crashed into terrain in poor weather conditions, the NTSB noted that had the pilot been required to perform a systematic evaluation of the flight risks (including assessments of weather minima and route of flight), the pilot may not have accepted the mission. The NTSB also cited the 2004 Battle Mountain, NV, fatal accident in which a helicopter air ambulance transporting a patient crashed into mountainous terrain while on a direct route in deteriorating weather conditions, and believed that if the pilot had performed a risk evaluation, he may have chosen a different route, and the accident may have been prevented. The NTSB also identified the 2004 Pyote, TX, fatal accident, in which a helicopter air ambulance transporting a patient crashed into terrain while maneuvering in reduced-visibility conditions and noted that the pilot had not performed a risk assessment.

²⁹ The International Helicopter Safety Team (IHST) and the Helicopter Association International (HAI) have developed resources, such as IHST’s “Safety Management System Toolkit,” to assist operators with implementing risk-analysis programs.

³⁰ NTSB, *Special Investigation Report on Emergency Medical Services Operations* ((NTSB/SIR-06/01) 4 (Jan. 25, 2006).

The FAA's proposal is intended to provide standard guidelines for the implementation of pre-flight risk analysis procedures. Under the proposal, the pilot in command of a helicopter air ambulance would be required to conduct a pre-flight risk assessment before the first leg of each helicopter air ambulance operation. Helicopter air ambulance operations generally consist of two legs, such as a hospital-to-hospital transfer, or three legs, in which the helicopter departs its base to pick up a patient, transfers the patient to a hospital, then returns to base. The pre-flight analysis only would need to be conducted before departure on the first leg, but should be conducted with consideration for each leg of the operation. The pilot also would be required to sign the completed risk analysis worksheet, and provide the date and time of signing. Through this requirement, the FAA intends to highlight that the pilot is responsible for accurately completing this worksheet.

The FAA proposes to require certificate holders to establish their risk assessment procedures and document them in their operations manuals. A pre-flight risk analysis would consist of at least the following: (1) flight considerations (for example, a review of any obstructions and terrain along the entire intended route, altitude considerations for the area being flown, and fuel considerations); (2) human factors (for example, whether a pilot may be affected by personal stress, knowledge of the patient's injuries (e.g., pediatric, or critical injury), fatigue, and experience in the type of operation to be conducted); (3) weather along the intended route (for example, weather for take off, en route, and destination airports to include forecasts); (4) whether another operator has refused or rejected the flight request; and (5) strategies for mitigating identified risk, including obtaining and documenting the certificate holder's management personnel's approval of the decision to accept a flight when the risks are elevated. Certificate holders would be permitted to add additional categories to mitigate risks associated with their specific operations.

As previously noted, certificate holders would be required to develop a method to determine whether the flight request had been offered to another company. This provision is intended to combat the practice of “helicopter shopping” in which a flight request turned down by one company will be offered to another. If another company had been offered and refused the flight, it is important to understand why the flight was refused. If a flight was refused because of weather considerations, that information should feature prominently in the second company’s pre-flight risk analysis. However, if the first company turned down the flight because its helicopter was inoperative, then that refusal likely would not impact the risk assessment for the second company in determining whether to accept the flight. The FAA notes that the helicopter air ambulance industry has taken steps to address this problem, for example by creating a website (www.weatherturndown.com) where companies can report when they do not accept a flight and the basis for the decision. Nevertheless, the FAA is proposing a requirement to ensure that this practice is adopted by all certificate holders authorized to conduct helicopter air ambulance operations.

In addition, the proposal would require certificate holders to establish a procedure for obtaining and documenting management personnel’s decision to launch a flight when the risk reaches a predetermined level. This provision is designed so that pilots will seek a second opinion regarding whether to launch. This would be particularly effective where the risk is not so great that it is clear that the flight should be refused, but rather when it is at a level where a pilot may be unsure about the flight’s safety, and the pilot may feel personal pressure to perform the flight and perhaps save a life despite the identified risks. The FAA emphasizes the basic concept articulated in Notice 8000.301 that risk analysis forms should not be used by a certificate holder’s management personnel, or others within an organization, to override a pilot’s decision to decline a flight assignment.

The FAA's proposal also would require certificate holders to retain the original or a copy of completed pre-flight risk analysis worksheets for at least 90 days from the date of the operation. Certificate holders would be permitted to determine where the completed worksheets will be kept, but the procedures for collecting the worksheets and maintaining the records would need to be outlined in certificate holders' operations manuals.

The FAA notes that this proposal would respond to NTSB Safety Recommendation A-06-13 in which the NTSB recommended that the FAA require helicopter air ambulance operators "to develop and implement flight risk evaluation programs that include training all employees involved in the operation, procedures that support the systematic evaluation of flight risks, and consultation with others in EMS flight operations if the risks reach a predefined level." This proposal also may contribute to a certificate holder's overall safety program because a pre-flight risk assessment would be a method of incorporating proactive safety methods into a company's flight operations. Accordingly, this proposal also would partially address NTSB Safety Recommendation A-09-89 regarding the implementation of sound risk management practices.

Certificate holders would be required to comply with this provision by the effective date of the final rule.

e. Medical personnel pre-flight briefing (§135.619)

The FAA is proposing to add §135.619 to require that medical personnel on board a helicopter air ambulance flight receive a supplemental pre-flight safety briefing with information specific to helicopter air ambulance flights. This information would be in addition to the passenger briefing currently required under part 135. As an alternative to the proposed pre-flight safety briefing, certificate holders would be permitted to provide training every 2 years to medical personnel through an FAA-approved training program. This proposal would positively

affect the safety of operations because as a result of an increased familiarity with the aircraft and emergency procedures, medical personnel would be less likely to inadvertently introduce risk to the operation when outfitting the passenger compartment the purpose of providing medical treatment and when providing medical care to a patient.

The following accidents exemplify the types of accidents that this proposal is intended to prevent.

On November 9, 2004, the pilot of a Bell 206L1 helicopter, operated under part 91 near Tulsa, OK, lost control during cruise flight and crashed causing substantial damage to the helicopter. The pilot stated that the medical personnel added two oxygen tanks in the cargo area before take off. The oxygen tanks were stacked and reached approximately the same height as the cargo area's latch release. The NTSB noted the accident was caused by the loss of tail rotor drive as a result of a blanket coming in contact with the tail rotor blades after the baggage compartment door unlatched during flight. NTSB Accident Report DFW05LA019 (Feb. 24, 2005).

On March 6, 2003, a pilot operating a Bell 206L-3 under part 91 lost control of the helicopter. No injuries were sustained by the flightcrew or medical personnel on board. Before take off to pick up a patient in Llano, TX, medical personnel opened and closed the aft cargo compartment. The NTSB noted that the accident was caused by a blanket from the aft cargo compartment that entered into the tail rotor blades causing the pilot's loss of control. The NTSB determined that the aft cargo compartment lock was fully operational, and a contributing cause of the accident was medical personnel improperly securing this compartment. NTSB Accident Report FTW03LA104 (Aug. 26, 2003).

Under the proposal, certificate holders would be required to brief medical personnel before flight on specific topics including the physiological aspects of flight (how flight affects

the human body), patient loading and unloading, safety in and around the aircraft, and emergency procedures. This briefing would supplement the passenger briefing requirements found in §135.117(a) and (b). The FAA believes that an additional safety briefing is warranted because of the unique role of medical personnel on helicopter air ambulance flights, which may include working around an operating helicopter, patient loading and unloading, and providing medical care within a compact, moving, vehicle. The FAA would permit the briefing to be provided once per shift for medical personnel assigned to a helicopter air ambulance base.

The FAA is proposing to allow certificate holders the option to provide safety training to medical personnel in lieu of the pre-flight briefing. Training topics would include the same topics addressed in the proposed pre-flight safety briefing. The FAA believes that it would be advantageous to certificate holders to implement medical personnel training programs. Training programs would help ensure that medical personnel serving on board their helicopters have enhanced knowledge of the required training topics and a greater familiarity with the aircraft than those who receive only the pre-flight briefing. The FAA anticipates that certificate holders who fly with a consistent group of medical personnel would take advantage of this provision to expedite operations. The proposal would require that the certificate holder's training program be approved by the FAA, and that medical personnel receive training every 24 months. The training program would include a minimum of 4 hours of ground training and 4 hours of training in and around a helicopter air ambulance. In the event some medical personnel on board a helicopter air ambulance flight have received this training, but others have not, the pilot in command would be required to provide the proposed supplemental pre-flight safety briefing.

The FAA notes that these provisions incorporate aspects of agency guidance in AC 135-14A, *Emergency Medical Services/Helicopter*, which includes suggested training for medical personnel in aviation terminology, use of medical equipment in the aircraft,

physiological aspects of flight, and patient loading and unloading. This proposal also incorporates aspects of AC 00–64, including human factors, training, encouraging communications, and promoting standard operating procedures.

Under the proposal, the FAA would require the certificate holder to document the training it provides to each individual who serves as medical personnel, and maintain a record of that training for 26 calendar months following the individual’s completion of training. This record would include the individual’s name, the most recent date that training was completed, and a description, copy, or reference to the training materials used. The FAA is proposing this period of time because the training provided to medical personnel would expire after 24 months, and the additional 60-day period would ensure that the records would be available for review by the FAA after the training had expired, if necessary.

Certificate holders would be required to comply with this provision by the effective date of the final rule.

2. Equipment Requirements

a. Helicopter terrain awareness and warning systems (HTAWS) (§135.605)

The FAA is proposing to add §135.605(a) to require that all helicopters used in air ambulance operations be equipped with HTAWS. The FAA believes that HTAWS would assist helicopter air ambulance pilots in maintaining situational awareness of surrounding terrain and obstacles, and therefore help prevent accidents caused by CFIT, loss of control, inadvertent flight into IMC, and night operations. HTAWS has particular relevance to helicopter air ambulance operations, which often are conducted at night and into unimproved landing sites.

HTAWS³¹ is a helicopter-specific application of TAWS technology. TAWS technology originally was developed for airplanes and is required on turbine-powered airplanes configured with six or more passenger seats used in part 135 operations. In 2005, the FAA recommended that helicopter air ambulance operators consider using TAWS for night operations when conditions and mission dictate.³² However, TAWS technology presents operational difficulties, such as nuisance warnings, when used in helicopters. HTAWS takes into account that helicopters generally do not fly as fast as airplanes and typically operate closer to the ground in hazard-rich environments. HTAWS assesses the aircraft's position over a smaller area of terrain than TAWS to prevent warnings to pilots of terrain or obstacles that do not immediately pose a hazard. The FAA believes that the decrease in nuisance warnings with HTAWS increases the usefulness of the equipment. It is because of these significant differences that the FAA is proposing to require certificate holders to install HTAWS and would not accept TAWS designed for an airplane as an alternate means of compliance.

In 2006, RTCA, Inc. established a special committee that developed RTCA/DO-309, *Minimum Operational Performance Standards (MOPS) for Helicopter Terrain Awareness and Warning System (HTAWS) Airborne Equipment*. The FAA subsequently issued TSO-C194, which sets out the minimum performance standards for HTAWS. A survey of FAA inspectors revealed that 41 percent of certificated helicopter air ambulance operators have started equipping their helicopter fleets with TAWS. However, the FAA did not ask in its survey whether these devices were compliant with TSOs for TAWS (TSO-C151, *Terrain Awareness and Warning System*) or HTAWS (TSO-C194). The FAA recognizes that some certificate holders voluntarily equipped their helicopters with TAWS, or other TAWS-like devices, that may not meet the

³¹ HTAWS uses its position sources to determine a helicopter's horizontal and vertical position and compare it to surrounding terrain. HTAWS derives a helicopter's ground speed, position, and altitude from a global positioning system (GPS) and a pre-programmed algorithm database installed and maintained by the HTAWS manufacturer.

³² Notice 8000.293.

standards of TSO–C194 for HTAWS. Nevertheless, the FAA is proposing that these certificate holders equip their helicopter air ambulances with HTAWS because of the differences between TAWS and HTAWS. The FAA proposes to incorporate the standards articulated in TSO–C194 by reference in §135.605(a).

The FAA believes the following accident is illustrative of the type of accident that may be prevented if helicopters are equipped with HTAWS. On March 21, 2002, a Eurocopter AS-350B helicopter, returning to its base in Susanville, California, collided with the surface of a lake. The pilot became disoriented as they flew over the “glassy smooth” water, and subsequently descended “within 20 to 50 feet of the lake surface” and eventually struck the lake surface causing fatal injuries to the pilot and serious injuries to the medical personnel. The NTSB determined that the causal effect of the accident was the pilot’s failure “to maintain sufficient altitude/clearance above the water while performing a low altitude flight.” The NTSB also cited as contributing factors the “the glassy water conditions, and lack of visual cues concerning perception of altitude.” *See* NTSB Accident Report LAX02FA114 (Apr. 28, 2004).

In its January 25, 2006, *Special Investigation Report on Emergency Medical Services Operations*, the NTSB stated that the “use of terrain awareness and warnings systems would enhance the safety of emergency medical services flight operations by helping to prevent controlled flight into terrain accidents that occur at night or during adverse weather conditions.”³³ The NTSB cited the 2004 Pyote, TX, fatal accident in which a helicopter air ambulance transporting a patient crashed into terrain while maneuvering in reduced-visibility conditions. The NTSB stated that if “a TAWS had been installed and appropriately set to a minimum safe altitude setting, the pilots would have received ample warning during their respective aircraft’s gradual descent into terrain” The FAA notes that this proposal

³³ NTSB/SIR-06/01, p. 11.

addresses NTSB Safety Recommendation A-06-15, which called on the FAA to require helicopter air ambulance operators “to install terrain awareness and warning systems on their aircraft and to provide adequate training to ensure that flight crews are capable of using the systems to safely conduct EMS operations.”³⁴

The FAA notes that other organizations recognize the value of HTAWS. The Flight Safety Foundation found that HTAWS could address risk-associated low-level VFR operations, especially at night.³⁵ The Air Medical Physician Association noted that a team organized to study helicopter air ambulance accidents determined that TAWS could be a highly effective accident intervention strategy.³⁶ The team made its determinations by reviewing the technical, financial, regulatory, and operational feasibility of its proposed interventions.

Under the proposal, the FAA would give certificate holders 3 years from the effective date of the final rule to install HTAWS that meets the standards of TSO-C194. The FAA believes 3 years will provide ample time for the manufacture of an adequate supply of HTAWS units and for these units to be incorporated into helicopters. In addition, a 3-year compliance period will permit certificate holders to spread out the cost of compliance over that period of time.

The FAA notes that it considered allowing certificate holders to use NVGs in lieu of HTAWS. However, the FAA has decided against such a proposal because NVGs may not be appropriate for all operations (for example, inadvertent flight into IMC), and additional time is needed to research the best use of the equipment before allowing it to be used as an alternate method of compliance. The FAA also considered requiring all commercial helicopters to be equipped with HTAWS; however, the agency believes the greatest benefit would be realized by

³⁴ *Id.*

³⁵ Flight Safety Foundation, Helicopter Emergency Medical Services (HEMS) Industry Risk Profile 43 (2009).

helicopter air ambulance operators because a much greater percentage of their operations are conducted at night and in off-airway routing, and involve unimproved and unfamiliar landing areas.

The FAA seeks comments on the proposed requirement to install HTAWS, the proposed implementation date, and possible alternatives to this provision. Comments should be accompanied by appropriate supporting documentation, data, and analysis.

b. Light-weight aircraft recording system (LARS)

The FAA is considering requiring certificate holders conducting helicopter air ambulance operations to install a light-weight aircraft recording system (LARS) in their helicopters. The FAA would target this proposal towards the helicopter air ambulance industry because of the number of accidents experienced by this segment of the commercial helicopter industry. As discussed earlier in this NPRM, between 1994 and 2008 helicopter air ambulances suffered a greater amount of accidents as compared with other commercial helicopters.

LARS comprises a system or combination of systems which record a helicopter's flight performance and operational data. The FAA is considering requiring the installation of LARS in order to provide critical information to investigators in the event of an accident. The FAA anticipates providing 3 years to allow sufficient time to procure and install LARS.

Flight data recording devices are not widely used in the commercial helicopter air ambulance industry. Responses to FAA Notice 8900.63, *Validation of HEMS Safety Initiatives*, issued January 12, 2009, indicated that approximately 89 percent of existing helicopter air ambulance certificate holders have not equipped with a flight data recorder (FDR) system or an "FDR-like system." The FAA believes that LARS can be used to assist accident investigations,

³⁶ Air Medical Physician Association, A Safety Review and Risk Assessment in Air Medical Transport 15-17

as well as to promote operational safety, and that an equipage requirement may be warranted due to the small number of certificate holders that are using such devices.

Currently, §135.151 requires a cockpit voice recorder (CVR) system in rotorcraft with a passenger seating configuration of six or more seats and for which two pilots are required by certification or operating rules. In addition, §135.152 requires FDRs in rotorcraft with a passenger seating configuration of 10 or more seats. Most helicopters used in air ambulance operations are configured with fewer than six seats and, therefore, are not equipped with CVRs or FDRs. The FAA would require installation of LARS for all helicopter air ambulances regardless of passenger seating capacity or the number of pilots required by certification or operating rules, unless a certificate holder could demonstrate that a CVR or FDR could be used to comply with any requirements. The FAA notes that §135.152(k) excepts certain helicopters manufactured before August 18, 1997, from the FDR requirements of §135.152. Nevertheless, if such helicopters are used in air ambulance operations, certificate holders would be required to equip those helicopters with LARS.

The FAA notes that NTSB Safety Recommendation A-06-17 recommended requiring all transport-category rotorcraft operating under part 91 or part 135 to be equipped with CVRs and FDRs. The FAA is not proposing to require traditional CVRs or FDRs in helicopter air ambulances, as required for other aircraft because of the cost and the weight of such equipment. CVR and FDR installation is a complex process that includes invasive access and modifications to install necessary sensors and wiring. The costs of a supplemental type certificate (STC) and the CVR and the FDR equipment could prove to be prohibitive for this application. In addition, helicopter air ambulances tend to be smaller than aircraft for which CVRs and FDRs are required, and available space and weight allotted for personnel and medical equipment are at a

premium. An FAA review of Operations Safety System (OPSS) data showed that more than 70 percent of the helicopters listed on helicopter air ambulance operators' certificates weigh less than 6,000 pounds. A combination CVR and FDR is estimated to weigh up to 10 pounds compared with LARS that may weigh less than 1 pound to 5 pounds. Therefore, the FAA believes the weight of a CVR and an FDR would have a greater adverse impact on a helicopter air ambulance operator's ability to provide medical care to a patient and on the performance characteristics of a smaller helicopter than LARS.

LARS would be required to capture data according to a broadly defined set of parameters including information pertaining to the aircraft's state (such as heading, altitude, and attitude), condition (such as rotors, transmission, engine parameters, and flight controls), and system performance (such as full authority digital engine control, and electronic flight instrumentation system). The FAA is considering requiring operation of a helicopter's LARS from the application of electrical power before take off until the removal of electrical power after termination of flight. LARS would have to receive electrical power from the helicopter's bus that provides the maximum reliability for operation without jeopardizing service to essential or emergency loads.

Requiring these devices to capture a comprehensive set of parameters, such as those in place for FDRs, *see* 14 CFR 135.152, would significantly increase the cost of these units. The FAA estimates that LARS cost \$6,450, plus installation and software to obtain data from the unit. The FAA believes that this requirement could be broadly and quickly implemented by the helicopter air ambulance industry in part because of the relatively low cost of these devices.

The FAA acknowledges that LARS does not have the same crash survivability as CVRs and FDRs which are required by regulation to meet a crash-worthiness standard. Nevertheless, the FAA believes that LARS will yield beneficial data when used in helicopter air ambulances.

Helicopter accidents usually involve forces much less severe than airplane accidents, as the flight envelope is usually much smaller. For example, helicopter accidents seldom involve impact airspeed in excess of 150 knots. Accidents which occur in hover operations typically involve speed less than 10 knots. Likewise, altitude ranges and vertical speeds are normally substantially less than the potential airplane accident profiles. These facts lend credence to the concept of LARS for accident investigation purposes using devices that are not hardened to the extent required by the Technical Standard Order for Flight Data Recorders or Cockpit Voice Recorders.

In addition, the FAA's Office of Accident Investigation and Prevention (AVP) reviewed helicopter air ambulance accident photographs from the last three years and found that the rear section of the tailboom (near the tail cone, tail rotor attachment and/or tail fin) has a high physical survival rate. This section of the aircraft often experiences the lowest deceleration loads (the rest of the aircraft has crumpled or disintegrated forward of the tail, absorbing or attenuating the deceleration), and is furthest from the fuel system, and hence usually unburned. This is most likely in straight-on impact, which is usually associated with controlled flight into terrain accidents. In loss of control accidents, where the mechanics of impact may be more varied, the rear of the tailboom usually survives. AVP estimated a survival rate of the rear of the tailboom structure (without structural compromise or burn damage) to be approximately 70 percent. Therefore, the FAA believes that a LARS memory module in the rear of the tailboom would allow a high potential for survival in the event of an accident. The FAA also notes that the NTSB found that LARS "are crash-resistant and can provide significant information for investigators to determine accident causation"³⁷

The proposal under consideration is to require the installation of LARS to provide event data to aid investigators after an accident. Currently, because most helicopter air ambulances are

³⁷ NTSB Safety Recommendations A-09-87 through A-09-96, Sep. 24, 2009, p.9.

not equipped with flight data recording devices, investigators must piece together information pertaining to an accident from a variety of sources. LARS could provide precise technical data regarding the flight, such as heading, altitude, and attitude that may otherwise be unavailable. The FAA asks for comments on whether LARS will provide data that is valuable in an accident investigation.

The FAA also invites comments on whether operators that are required to install LARS for accident investigation would also use those systems to improve daily operations, including whether operators would be more likely to participate in an FAA-approved Flight Operations Quality Assurance (FOQA) program if required to equip helicopters with LARS. A LARS could be used to collect digital flight data in an FAA-approved FOQA program. FOQA participants use the collected data to improve the safety of their operations, while the FAA uses the data to observe trends in operations and make system-wide safety enhancements based on those trends. In order to provide an incentive for participation in the FOQA program, the FAA protects certain voluntarily-submitted FOQA data against public release and, except for criminal or deliberate actions, will not use FOQA data obtained from an operator's FOQA program in an enforcement action against that operator or its employees.³⁸ These protections are available only if the data is collected by the operator pursuant to a voluntary, FAA-approved, FOQA program.

The FAA is also considering requiring certificate holders that conduct air ambulance operations to install LARS and create a program that would use data obtained from the device to analyze and mitigate risk. Certificate holders could use the LARS data to modify their operational and maintenance procedures, provide immediate feedback to pilots in training, and highlight areas in which additional training may be needed. Certificate holders also could use

³⁸ See 14 CFR 13.401(e); 14 CFR part 193; 66 FR 55042 (Oct. 31, 2001); Advisory Circular 120-82, *Flight Operational Quality Assurance* (Apr. 12, 2004); FAA Order 8000.81, *Designation of FOQA Information as Protected from Public Disclosure under 14 CFR part 193* (Apr. 14, 2003).

the data as a training tool during flight simulator training sessions to reproduce situations that actually occurred in its operations.

Certificate holders would be required to collect flight performance and operational data that characterizes the state of the helicopter and its subsystems which the certificate holder determines is pertinent to its safety program. Each certificate holder would be required to document the procedures and tools it would use to download and analyze the data from LARS, and the procedures and criteria it would use to identify and evaluate the data from LARS to enhance safety in its operations.

The FAA would require a certificate holder to establish a method to retrieve, analyze, and evaluate data that is collected by LARS. Under this proposal, the FAA intends to provide flexibility to certificate holders with respect to how each certificate holder uses its LARS data by allowing them to establish an individualized program that is unique to its operation.

The FAA notes that this proposal would address NTSB Safety Recommendation A-09-90 that recommends requiring certificate holders to install flight data recording devices on helicopter air ambulances and to “establish a structured flight data monitoring program that reviews all available data sources to identify deviations from established norms and procedures and other potential safety issues.” Because the FAA would require LARS under this scenario, the data developed by operators would not be eligible for protection under 14 CFR part 193, *Protection of Voluntarily Submitted Information*.

Under this proposal, the FAA anticipates that certificate holders could use FDRs installed in helicopter air ambulances to comply with the LARS requirement. If the certificate holder is required under §135.152 to have an FDR, it would be able to choose to use either the FDR or a certified quick-access recorder (QAR) connected to the flight data acquisition unit to comply with this requirement. A QAR provides a means to access the data collected by a FDR without

removing the FDR. The time and effort required to access and download data from the FDR could be prohibitive. The additional weight from a QAR installation is about 0.5 pounds. A QAR unit, STC, and support software can cost \$10,000 to \$15,000, compared to the cost and installation of a LARS of less than \$10,000. In either case, the proposed requirement to show how this data is being used to improve the safety of flight operations would remain applicable.

The FAA considered permitting a CVR as an alternate means of complying with the proposed requirement to use LARS in an accident prevention program. However, similar to an FDR, the data recorded on a CVR may be difficult to retrieve following a flight. CVRs may be installed in hard-to-access locations inhibiting access to the unit. Further, obtaining the data may require the certificate holder to remove the CVR from the aircraft in order to transfer the data in an audible format. This process is time-consuming and labor-intensive, potentially causing the helicopter to remain out of service for a period of time. A certificate holder may require an inventory of CVRs to replace a removed CVR and immediately return the helicopter to service. Although CVRs provide excellent post-accident information, the CVR data alone does not provide adequate information for an accident prevention program. The FAA believes that these inefficiencies, combined with the limited usefulness of a CVR, could present a significant barrier to using CVR information to improve the safety of a certificate holder's operations.

Although CVRs, FDRs, and QARs have been successfully implemented in several industry accident prevention programs, as discussed, the FAA does not believe that traditional recorders provide the most efficient means to collecting flight performance and operational data for helicopter air ambulances. In light of the fact that some helicopters currently used in air ambulance operations may be equipped with CVRs or FDRs, and given the comprehensive amount of data collected by and superior crashworthiness of those devices, the FAA calls for

comments regarding how certificate holders could incorporate these devices into a program to enhance the safety of helicopter air ambulance operations.

3. Pilot Requirements

a. Instrument rating (§135.603)

The FAA is proposing to add §135.603 to require a helicopter air ambulance pilot to hold a helicopter instrument rating.

Currently, §135.243(a) and (b) require the pilot in command of a helicopter air ambulance to hold, at a minimum, a commercial pilot certificate. To obtain a commercial pilot certificate with a helicopter rating, §61.129(c) requires that a pilot complete 10 hours of instrument training. However, helicopter air ambulance pilots are not required to hold instrument ratings unless they will be performing IFR or VFR over-the-top operations. In addition to other requirements, §61.65 requires a pilot to complete 50 hours of cross-county flight time as pilot in command and 40 hours of actual or simulated instrument time to obtain an instrument rating.

As discussed previously, the FAA found that inadvertent flight into IMC is a common factor in helicopter air ambulance accidents. In general, many accidents result when pilots who lack the necessary skills or equipment to fly in marginal VMC or IMC and attempt flight without outside references. This proposal is intended to ensure that helicopter air ambulance pilots are equipped to handle these situations and extract themselves from these dangerous situations. A pilot who receives the more extensive training on navigating a helicopter solely by reference to instruments provided by obtaining an instrument rating is better able to maintain situational awareness and maneuver the helicopter into a safe environment than a pilot without an instrument rating.

The FAA is not proposing that a helicopter air ambulance pilot maintain instrument currency. This proposal is targeted to VFR operators because operators conducting IFR operations already must maintain instrument currency. The FAA has chosen this approach because, for VFR operators, this capability may require fewer resources than required to meet full currency requirements while maintaining adequate safety standards. Under this proposal, pilots would be required to demonstrate the ability to recover from inadvertent IMC during their annual competency checks.³⁹ The FAA believes that pilots who learn basic instrument skills while obtaining an instrument rating, supplemented by preparation for an annual competency check, will be adequately prepared to recover from an inadvertent IMC encounter.

This proposal would take effect 3 years after the effective date of the rule to allow helicopter air ambulance pilots who are not instrument-rated adequate time to pursue an instrument rating and to distribute the costs over a period of time.

b. Flight and duty time limitations (§§135.267 and 135.271)

The FAA is proposing to amend §§135.267 and 135.271 to require helicopter air ambulance operations conducted with medical personnel on board to count towards a pilot's daily flight time limitations.

Currently, in certain situations, flight segments conducted without passengers but with medical personnel on board the helicopter are conducted under part 91. Specifically, part 91 segments preceding part 135 segments are considered "other commercial flying" and count towards a pilot's daily flight time limitations. Part 91 segments that follow part 135 segments do not count towards the daily flight time limitations under §135.267 or §135.271, although these

³⁹ See section III.B.3. of the preamble to this NPRM.

flights count towards a flightcrew member's quarterly and yearly flight time limitations because they are commercial flights.

Helicopter air ambulance accidents have not been limited to flights conducted while patients were on board the aircraft. In fact, 35 of the 55 accidents included in the NTSB's January 2006 *Special Investigation Report on Emergency Medical Services Operations*, occurred with medical personnel but no patients were on board.⁴⁰ The FAA, therefore, is proposing to provide additional protections to medical crewmembers on flights, which under the current rules, would be conducted under part 91.

As previously discussed, the FAA is proposing to apply part 135 rules to all helicopter air ambulance flights with medical personnel on board. This would have the effect of bringing such flight segments of a helicopter air ambulance operation under the part 135 flight and duty rules. The changes proposed to §§135.267 and 135.271 emphasize that all flight time in helicopter air ambulance operations would be considered flight time that counts towards a pilot's daily flight time limitations.

The FAA notes that these proposed changes respond to NTSB Safety Recommendation A-06-12. In that recommendation, the NTSB recognized that part 135 and part 91 differ regarding crew rest requirements--part 135 contains flight time limitations and rest requirements while part 91 does not. The NTSB emphasized in that recommendation that the phases of flight that involve transporting medical personnel, patient drop-off, and aircraft positioning comprise the EMS mission and should not be differentiated. The NTSB concluded that the safety of EMS operations would be improved if the entire EMS flight operated under part 135 operations specifications.

⁴⁰ NTSB, *Special Investigation Report on Emergency Medical Services Operations* (NTSB/SIR-06/01) 3 (Jan. 25, 2006)

Certificate holders would be required to comply with this provision by the effective date of the final rule.

B. Commercial Helicopters Operations (Including Air Ambulance Operations)

The following provisions would apply to all commercial helicopter operations, including helicopter air ambulance operations, conducted under part 135. These proposals include new operational and equipment requirements for affected certificate holders.

1. Operational Procedures

a. IFR alternate airport weather minima (§135.221)

The FAA is proposing to amend §135.221 to revise the alternate airport weather minima for helicopter IFR operations. Currently, pilots conducting IFR operations must designate an alternate airport at which the weather conditions will be at or above the authorized landing minima at the estimated time of arrival.

Under the proposal, for part 97 instrument approach procedures or special instrument approach procedures, to designate an airport as an alternate, the ceiling at the alternate airport would need to be 200 feet above the minimum for the approach to be flown, and the visibility would need to be at least 1 statute mile, but never less than the minimum visibility for the approach to be flown. For airports without a part 97 instrument approach or no special instrument approach procedure, the ceiling and visibility minima would be those allowing descent from the minimum en route altitude, approach, and landing under VFR.

The FAA notes that the proposal recognizes the differences in operating characteristics between helicopters and airplanes. Helicopters fly shorter distances at slower airspeeds than most other aircraft, carry less fuel than an airplane, and generally remain in the air for shorter

periods of time between landings. As a result, it is often more difficult for a helicopter to fly out of a weather system to an alternate destination. In addition, the destination airport and alternate airport are likely to be in the same air mass and thus experiencing similar weather. Therefore, requiring pilots to use increased weather minima when selecting an alternate airport would improve the likelihood of landing at the alternate airport if weather conditions in the area deteriorate while the helicopter is en route.

The FAA notes that it adapted this proposal from the current alternate airport weather requirement in §91.169 and from the weather minima in Operations Specification H105 issued to part 135 helicopter operators conducting IFR operations. The FAA also notes that the Part 125/135 ARC recommended a similar change.

Certificate holders would be required to comply with this provision by the effective date of the final rule.

2. Equipment Requirements

a. Radio altimeter (§135.160)

The FAA is proposing to add §135.160 to require radio altimeters for all helicopters operated under part 135. Certificate holders would have 3 years from the effective date of the final rule to comply. Currently, part 135 does not require radio altimeters for any aircraft. However, under FAA Operations Specification A050, helicopter operators authorized to use night vision goggles in night operations are required to use radio altimeters.

Radio altimeters are designed to inform the pilot of the aircraft's actual height above the ground.⁴¹ A radio altimeter can greatly improve a pilot's awareness of height above the ground

⁴¹ A radio altimeter sends a radio wave to the ground and determines the height of aircraft above the surface by measuring the time it takes for the radio wave to be reflected back to the receiving unit. Altitude is then displayed on the aircraft's control panel. Additionally, the pilot can select a low altitude indicator to alert him or her of a low-altitude situation.

(AGL) during hover, landing in unimproved landing zones (rough field landings), and landings in confined areas where a more vertical approach may be required. Additionally, radio altimeters help increase situational awareness during inadvertent flight into IMC, night operations, and flat-light, whiteout, and brownout conditions. In all of these conditions, pilots lose their reference to the horizon and to the ground.

Radio altimeters are proven technology that is relatively low-cost, reliable, and user-friendly. According to a January 2009 FAA survey of certificate holders authorized to conduct helicopter air ambulance operations, 89 percent of helicopter air ambulance operators have installed radio altimeters on their aircraft. The FAA estimates, based on a sampling of certificate holders, that 75 percent of helicopters used in other part 135 operations are currently equipped with radio altimeters.

The FAA believes that the following accident illustrates the type of accident that may have been prevented with the use of radio altimeters. On May 31, 2006, a Bell 206L-1 helicopter, operating under 14 CFR part 135 and originating in Juneau, AK, collided with terrain while maneuvering in reduced visibility over an ice field. The pilot encountered whiteout and flat light conditions, and fog. The pilot and two out of the six passengers received minor injuries. During the investigation, the pilot stated that he could not “discern the ground below him due to the flat light conditions.” The NTSB cited “the pilot’s failure to maintain adequate altitude/clearance from terrain while maneuvering in adverse weather conditions” as the probable cause of the accident. The NTSB further noted that the helicopter was not equipped with a radio altimeter. *See* NTSB Accident Report ANC06LA066 (Feb. 26, 2007).

The proposal would respond to NTSB Safety Recommendation A-02-35, which was issued after the investigations of several accidents in which flat-light or whiteout conditions

were mentioned as the probable cause. In its recommendation, the NTSB noted that radio altimeters, currently not required for helicopters, might aid pilots in recognizing proximity to the ground in flat-light and whiteout conditions.

In addition, the FAA notes that the proposal would respond to the Part 125/135 ARC's recommendation to require installation of radio altimeters in helicopter air ambulances. For the reasons discussed above, however, the FAA is proposing broader use of radio altimeters to increase safety in all part 135 rotorcraft operations.

The FAA notes that this proposed rule would require helicopter air ambulances to be equipped with both HTAWS and a radio altimeter. Additionally, other commercial helicopter operators may opt to voluntarily equip their helicopters with HTAWS. The FAA considered whether to permit devices that perform functions similar to radio altimeters, such as HTAWS, to satisfy the radio altimeter requirement. However, the FAA has determined that either an FAA-approved radio altimeter, or other device that measures an aircraft's altitude by sending a signal to the ground, should be required because of the accuracy of information obtained from those units and the method by which that information is collected. Some HTAWS are passive and derive the aircraft's ground speed, position, and altitude from a GPS and a preprogrammed algorithm database installed and maintained by the HTAWS manufacturer. Additionally, altitude indications on such systems often rely on the pilot setting the correct barometric pressure, which may change rapidly, to obtain an accurate reading. The FAA is concerned that passive systems may not provide as accurate an altitude reading for pilots experiencing brownout or white-out conditions while close to the ground. A radio altimeter is an active system that provides real-time information to the pilot regarding the aircraft's height above the terrain, including elevated heliports and buildings, by sending and receiving a signal from the aircraft. Radio altimeters are also not subject to variations in barometric pressure. The FAA notes that an

HTAWS that incorporates or works in conjunction with a radio altimeter function would meet the requirements of this proposal. The FAA seeks comment on the requirement to install a radio altimeter, and the safety benefits of installing both HTAWS and a radio altimeter. The FAA also seeks comments on the proposed effective date of this provision.

b. Safety equipment for over-water flights (§§1.1, 135.167, and 135.168)

The FAA is proposing to revise the definition of extended over-water operation in §1.1 as it applies to helicopters. The FAA also is proposing to amend §135.167 to exclude rotorcraft and add §135.168 prescribing graduated emergency equipment requirements for rotorcraft based on the distance the rotorcraft is operating from the shoreline. Certificate holders would have 3 years from the effective date of the final rule to comply with proposed §135.168.

Currently, under §91.205(b)(12) and §135.183, a passenger-carrying helicopter operating over water at an altitude that would not permit it to reach land in the event of engine failure must be equipped with approved flotation gear for each passenger and, unless it is a multiengine helicopter that meets certain performance requirements, helicopter flotation devices. Additionally, a helicopter engaged in extended over-water operations (currently defined as more than 50 NM from the nearest shoreline or offshore heliport structure) is required to carry the equipment listed in §135.167.

Under proposed §1.1, the reference to offshore heliport structures would be removed from the definition of “extended over-water operation” for helicopters. As a result, any operation conducted more than 50 NM from the nearest shoreline would be an extended over-water operation, regardless of proximity to offshore heliport structures. The FAA recognizes that the current rule permits helicopters to travel long distances from shore without carrying safety equipment other than flotation devices and life preservers, as long as they

remain within 50 miles of an offshore heliport. In the Gulf of Mexico, for example, some offshore oil platforms are located 150 NM from the shoreline. The FAA is concerned that offshore heliports may not provide the same search and rescue capabilities as are available on shore, such as Coast Guard patrols and a greater number of vessels in the vicinity. Accordingly, the FAA believes that this change would increase safety by eliminating the ability to hopscotch from heliport to heliport at great distances from shore without carrying water survival safety equipment.

Under proposed rule §135.168, a helicopter operating over water beyond autorotational distance from the shoreline but within 50 NM of the shoreline would be required to carry, among other equipment-- life preservers; a 406 megahertz (MHz) emergency locator transmitter that meets the requirements of TSO-C126a, *406 MHz Emergency Locator Transmitter (ELT)*, a pyrotechnic signaling device; and electronically deployable or externally mounted life rafts. For extended over-water operations, a helicopter would need to be equipped with the equipment required for over water operations, as well as additional survival equipment prescribed in proposed §135.168.

The FAA is proposing to require a 406 MHz ELT for several reasons. As indicated in previous rulemakings, the 406 MHz ELT provides an enhancement and more life-saving benefits, especially for over-water operations, than the 121.5/243 MHz ELT. *See* 65 FR 81316 (Dec. 22, 2000); 59 FR 32050 (Jun. 21, 1994). These benefits include a narrower search area, a stronger signal resulting in less interference, and the ability to code the transmitter with the owner's or aircraft's identification. Further, as of February 1, 2009, the international search-and-rescue satellite system, known as COSPAS-SARSAT, ceased monitoring 121.5 MHz ELTs in response to guidance from the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO). These organizations mandate safety requirements

for aircraft and maritime vessels and have recognized the limitations of the 121.5 MHz beacons and the superior capabilities of the 406 MHz alerting system.

Among the equipment that would be required under proposed §135.168 for operations conducted beyond autorotational distance from shore are electronically deployable or externally mounted life rafts. The FAA believes that life rafts, in addition to life preservers, are necessary safety equipment in the event of ditching. Passengers and crewmembers who are forced to exit a helicopter in water may be subject to strong currents and waves, making it difficult to swim or float with a life preserver for long periods of time. In addition, a person in a life raft is not as affected by cold water temperatures and is more visible to rescuers than if he or she is in the water. In accidents involving over-water operations, rescue aircraft can experience difficulty locating and reaching a downed helicopter because of the strength of the currents in which a ditching occurred and inaccurate coordinates provided by the pilot experiencing the emergency. Passenger access to emergency equipment sufficient to remain afloat for the period of time it is likely to take a rescue mission to reach the site enhances survivability.

The proposed requirement for electronically deployable or externally mounted life rafts would increase the likelihood that these items would be available during an emergency. In two accidents investigated by the NTSB, helicopters sank before passengers could deploy the life rafts that were on board.

One accident cited by NTSB occurred off the coast of Texas in 2005 following an in-flight fire and eventual dual-engine power loss. When the helicopter, which was operating under part 135, hit the water, it sank so rapidly that neither of the two life rafts stored under the cabin seats were retrieved before the helicopter sank. The occupants, all of whom were wearing personal flotation devices, survived; however, some occupants suffered hypothermia during the 7½ hours that elapsed before they were rescued. The NTSB noted that, although the survivors'

personal flotation devices were equipped with locator lights, the U.S. Coast Guard search and rescue crews, using night-vision goggles, reported that the lights were barely visible at night in the waters of the Gulf of Mexico. NTSB Accident Report DFW05MA230 (Apr. 28, 2009).

In another accident, which occurred in 2003, a helicopter operating under part 135 experienced engine failure over the Gulf of Mexico and ditched. The pilot and four passengers evacuated and inflated their personal flotation devices; however, the pilot and one passenger died and the other passengers were seriously injured before the rescue team arrived. The helicopter was equipped with a life raft located under the cabin seats, but it was not deployed. Surviving passengers indicated that they were not briefed about the location of the life raft. The NTSB noted “[w]ith better access to life rafts stored on board the aircraft and better signaling devices, occupants would have had a greater chance of surviving.” NTSB Accident Report FTW03FA097 (Apr. 28, 2005).

The FAA notes that these proposals address NTSB Safety Recommendation A-07-87 that recommends all existing and new turbine-powered helicopters operating in the Gulf of Mexico and certificated with five or more seats be equipped with externally mounted life rafts large enough to accommodate all occupants. Additionally, they address NTSB Safety Recommendation A-07-88 that recommends all offshore helicopter operators in the Gulf of Mexico provide their flight crews with personal flotation devices equipped with a waterproof, global-positioning-system-enabled 406 megahertz personal locator beacon, as well as one other signaling device, such as a signaling mirror or strobe light.

Additionally, the Part 125/135 ARC recommended that the FAA amend its regulations to base emergency equipment requirements on the distance a helicopter operates from the shoreline. The FAA agrees with the Part 125/135 ARC’s recommendation, and believes its proposed

changes would result in a higher level of safety because of the enhanced safety equipment carried by helicopters operating over water.

The FAA points out that the proposed safety equipment requirements for helicopters differ from those for airplanes. This distinction is made for two reasons. First, helicopters generally operate at lower altitudes than passenger-carrying aircraft. In the Gulf of Mexico, helicopters serving oil rigs typically operate at altitudes below 10,000 feet. These lower altitudes leave little power-off glide capability. Second, airplanes are designed with certain features that enable them to float for a period of time after ditching, such as doors above the waterline, closeable outflow valves in the wings, and, in some airplanes, pressurized cabins. Helicopters do not incorporate these design features and behave less predictably when ditched. Therefore, the FAA believes that helicopter passengers should have additional protections for survival in water if they need to exit the helicopter after ditching.

3. Training — Recovery from Inadvertent Flight into IMC (§135.293)

The FAA is proposing to amend §135.293 to require helicopter pilots to demonstrate recovery from an inadvertent IMC encounter and understand procedures for aircraft handling in flat-light, whiteout, and brownout conditions.

The current regulations do not require a pilot to demonstrate safely maneuvering an aircraft back into VMC following an inadvertent flight into IMC during a §135.293 competency check. Pilots seeking a commercial or airline transport pilot (ATP) certificate are not required to demonstrate an IMC recovery during the initial examination. A demonstration of IMC recovery is not included in the currency requirements for any pilot certificate. However, the FAA requires demonstration of Lost Procedures and Radio Navigation and Radar Services, which contain components similar to IMC recovery procedures under, the *Commercial Pilot Practical Test*

*Standards for Rotorcraft.*⁴² In AC 135–14A, the FAA also recommends that helicopter air ambulance pilots obtain training in basic instrument flying skills to assist in recovery from inadvertent flight into IMC.

Under this proposal, §135.293 would require a pilot to demonstrate a realistic course of action that he or she might take to escape from inadvertent IMC during a competency check. The FAA understands that aircraft are configured differently and instrument approaches may not be readily available in all places where helicopters operate. Therefore, the FAA would permit flexibility in the method by which a pilot meets the demonstration requirement and expects that inspectors would approve methods appropriate to the aircraft, equipment, and facilities available.

The proposal would require that the demonstration be scenario-based and include attitude instrument flying, recovery from unusual attitudes, navigation, ATC communications, and at least one instrument approach. The check-pilot should coordinate with ATC, if available, before the execution of the scenario to inform ATC that exercises will be performed with VFR-equipped helicopter and that radar vectors and directional turns will be requested. If the aircraft is appropriately equipped and the check is conducted at a location where an ILS is operational, the pilot should demonstrate an ILS approach. If the pilot is unable to conduct an ILS approach, he or she should demonstrate a GPS approach if the aircraft is equipped to do so and the pilot is properly trained. If neither an ILS nor GPS procedure can be performed, the pilot should perform another instrument approach. Partial panel operations, during which instrument failure or loss of instrumentation is simulated, should be considered if sufficient instruments are available from single sources.

The proposal also would require a pilot to demonstrate knowledge of the methods for avoiding the conditions described above and the proper aircraft handling on a written or oral test.

⁴² FAA–S–8081–16A.

To satisfy these requirements, the FAA anticipates that pilots would receive training on items such as landing zone reconnaissance, risk mitigation, maintaining situational awareness and decision-making on whether to land or choose an alternate landing site.

This provision would take effect on the effective date of the final rule.

In 2002, the NTSB issued Safety Recommendations A-02-33 and A-02-34 after investigating five commercial helicopter accidents in Alaska in which flat-light or whiteout conditions were thought to be the probable cause of the accidents. In its recommendations, the NTSB expressed concern that commercial helicopter operators who operate in such conditions are not required to be instrument-rated or to demonstrate instrument competency, and that those pilots are not provided with the training necessary to operate safely in such conditions. The NTSB therefore recommended in Safety Recommendation A-02-33 that the FAA require all helicopter pilots who conduct commercial, passenger-carrying flights in areas where flat light or whiteout conditions routinely occur to possess a helicopter-specific instrument rating and to demonstrate their instrument competency during initial and recurrent pilot testing required under 14 CFR 135.293. In addition, in Safety Recommendation A-02-34, the NTSB recommended requiring all commercial helicopter operators conducting passenger-carrying flights in areas where flat light or whiteout conditions routinely occur to include safe practices for operating in flat light or whiteout conditions in their approved training programs.

This proposed rule also would address NTSB Safety Recommendation A-09-87 that calls for development of scenario-based pilot training for helicopter air ambulance pilots that included inadvertent flight into IMC and hazards unique to helicopter air ambulance operations, and determine how frequently this training is required to ensure proficiency.

C. Miscellaneous

1. Part 91 weather minima (§91.155)

The FAA is proposing to revise §91.155 to prescribe visibility minima for helicopters operating under part 91 in Class G airspace. Section 91.155(b)(1) currently requires helicopters operating under VFR, at 1,200 feet or less above the surface, to remain clear of clouds and operate at a speed that permits the pilot adequate opportunity to see any air traffic or obstruction in time to avoid a collision. The FAA is concerned that the current standard does not provide an adequate margin of safety for pilots who may suddenly encounter IMC because of rapidly changing weather. The FAA is also concerned that the “clear of clouds” standard, without an associated minimum visibility, may encourage “scud running” in which pilots fly at a continually decreasing altitude to remain clear of lowering clouds in an attempt to stay in VFR conditions.

Consequently, the FAA is proposing a minimum visibility standard of ½ statute mile during the day, and 1 statute mile at night, for helicopters operating under VFR at 1,200 feet or less above the surface in Class G airspace. This proposal would provide a greater margin of safety for operators because pilots would be required to maintain a fixed amount of visibility, and would be less likely to suddenly encounter IMC. In addition to the proposed visibility minima, the proposed rule would retain the current requirement to remain clear of clouds.

This provision would take effect on the effective date of the final rule.

2. Load manifest requirements for all part 135 aircraft (§135.63)

The FAA is proposing to revise the requirements of §135.63 to apply to all aircraft operated under part 135 and to permit electronic transmission of manifest copies. In considering this proposal for commercial operations, the FAA determined this requirement would be beneficial for all part 135 operations. Currently, §135.63 requires the preparation of a load

manifest detailing information such as aircraft weight, center of gravity, crewmember identification, and other aircraft information before a flight involving a multiengine aircraft. The load manifest must be prepared in duplicate, and one copy must be carried on board the aircraft to its destination. Section 135.63 currently does not prescribe any specific action for the copy of the load manifest not carried on board the aircraft. However, the FAA has advised certificate holders to incorporate procedures in their operations manuals for the disposition of the duplicate copy.⁴³

In the past, multiengine airplanes were the predominant means of transportation under part 135. Recently, single-engine passenger carrying aircraft have increased in size and capacity and, therefore their use in on-demand operations has increased. In 2005, the 125/135 ARC recommended that the FAA amend load manifest requirements to include all part 135 aircraft. The FAA finds that all operators carrying passengers for hire must generate a manifest, regardless of the type of aircraft operated. In the event of an emergency, the operator must be able to account for aircraft occupants and, in the case of a fatal or serious accident, contact next of kin. Additionally, the FAA believes that, in the event of an accident, load manifest information pertaining to the aircraft's weight and balance would be useful in determining whether the aircraft was loaded within the aircraft's center-of-gravity limits and maximum allowable takeoff weight. Therefore a copy of the load manifest should be available if the copy on the aircraft is destroyed.

This proposal would respond to NTSB Safety Recommendation A-99-61. That recommendation followed a 1997 accident in which a single-engine aircraft operating under part 135 and not equipped with an FDR collided with terrain, killing the pilot and all eight

⁴³ Legal Interpretation to Stanley L. Bernstein, from Rebecca B. MacPherson, Assistant Chief Counsel for Regulations (Nov. 11, 2009), *available at* http://www.faa.gov/about/office_org/headquarters_offices/agc/pol_adjudication/agc200/Interpretations/.

passengers. The NTSB determined that weight and balance may have played a role. The NTSB expressed concern that “single-engine operators may not consistently give weight and balance calculations the attention necessary to ensure safe flight,” and noted that §135.63(c) currently requires only operators of multiengine aircraft to prepare an accurate load manifest in duplicate before each take off. The NTSB therefore recommended that the FAA amend the regulation “to apply to single-engine as well as multiengine aircraft.”

In addition, the FAA is proposing to eliminate the requirement that the load manifest be prepared in duplicate for certificate holders who elect to electronically transmit the information contained in the load manifest to their operations base before take off. A certificate holder electing this option would be permitted to transmit the information by facsimile, e-mail, online form, or other electronic means and the information must be received by the certificate holder’s base of operations or other approved location before take off. This would ensure that the load manifest information is available in the event that the copy carried on board the aircraft is destroyed. If a certificate holder does not elect to transmit load manifest information electronically, it would be required to prepare the load manifest in duplicate. Additionally, the proposed rule would require the pilot in command to arrange for a copy of the load manifest to be sent to the certificate holder, retained in a suitable place at the takeoff location, or retained in another location approved by the FAA.

The FAA notes that the proposed regulation would not alter the requirement that a copy of the load manifest must be carried on board the aircraft to its final destination, although that copy may be in an electronic format. In addition, the proposal would not change the required content of the load manifest.

Certificate holders would be required to comply with this provision by the effective date of the final rule.

While the FAA believes that proposed change could improve safety by enhancing pre-flight planning by pilots conducting part 135 operations, in its full Regulatory Evaluation (in the public docket for this rulemaking) the agency estimates it could impose costs of \$134 million or \$82 million present value. The FAA estimates that the present value benefits at 7% over 10 years would be \$20 million. The FAA seeks comments, accompanied by data, on how these costs could be reduced and how benefits could be increased while maintaining an equivalent level of safety.

IV. Paperwork Reduction Act

This proposal contains the following new information collection requirements. As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA has submitted the information requirements associated with this proposal to the Office of Management and Budget for its review.

Use: The information collection would enable helicopter air ambulance operators to verify that risk analyses are being performed and that safety procedures and training requirements are being followed. In the event of an accident, the FAA and other entities could examine these records.

Number of Respondents: 17,237

Estimate of Annual Burdens: The following proposals would result in recordkeeping burdens.

(1) Require certificate holders performing helicopter air ambulance operators to implement pre-flight risk-analysis programs (§135.615): This proposal would require that certificate holders outline procedures for conducting pre-flight risk-analysis programs in their operations manuals.

The following estimate corresponds to section A.1.d. of the economic evaluation.

Cost to helicopter air ambulance operators to develop a pre-flight risk analysis program

Air ambulance operators = 73
Time needed to develop risk analysis program = 60 hours
Salary of helicopter pilot = \$48 per hour

First-year cost
Cost: $73 \times 60 \times \$48 = \$210,240$
Time: $73 \times 60 = 4,380$ hours

Subsequent years: Per-year costs
Cost: \$0
Time: 0 hours

Total over 10 years
Cost: \$210,240
Time: 4,380 hours

Average per year
Cost: $\$210,240 / 10 = \$21,024$
Time: $4,380 \text{ hours} / 10 = 438$ hours

Cost for pilots to perform a pre-flight risk analysis before each flight

Air ambulance Helicopters = 989
Operations per year per aircraft = 367
Time needed for risk analysis = 10/60 hour
Salary of helicopter pilot = \$48 per hour

First-year cost
Cost: $989 \times 367 \times (10/60) \times \$48 = \$2,903,704$
Time: $989 \times 367 \times (10/60) = 60,494$ hours

Subsequent years: Per-year costs
Cost: $989 \times 367 \times (10/60) \times \$48 = \$2,903,704$
Time: $989 \times 367 \times (10/60) = 60,494$ hours

Total over 10 years
Cost: $\$2,903,704 \times 10 = \$29,037,040$
Time: $60,494 \text{ hours} \times 10 = 604,940$ hours

Average per year
Cost: $\$29,037,040 / 10 = \$2,903,704$
Time: $604,940 \text{ hours} / 10 = 60,494$ hours

(2) Require air ambulance operators with 10 or more helicopters to have an operations control center to communicate with pilots, advise pilots of weather conditions, and provide flight-following services (§135.617): This proposal would require certificate holders to train and test operations control specialists and retain records on those employees.

The following estimate corresponds to section A.1.b. of the economic evaluation.

Cost of Maintaining Records for the Operations Control Specialists' Training and Examinations

Operations control specialists = 288

Time needed for a clerical person to maintain records of the training and examinations = 5/60 hour

Salary of clerical person = \$26 per hour

First-year cost

Cost: $288 \times (5/60) \times \$26 = \$624$

Time: $288 \times (5/60) = 24$ hours

Subsequent years: Per-year costs

Cost: $288 \times (5/60) \times \$26 = \$624$

Time: $288 \times (5/60) = 24$ hours

Total over 10 years

Cost: $\$624 \times 10 = \$6,240$

Time: $24 \text{ hours} \times 10 = 240$ hours

Average per year

Cost: $\$6,240 / 10 = \624

Time: $240 \text{ hours} / 10 = 24$ hours

(3) Require additional VFR flight planning (§135.613): This proposal would require helicopter air ambulance pilots to perform pre-flight planning. Certificate holders would need to outline procedures for pre-flight planning in their operations manuals.

The following estimate corresponds to section A.1.c. of the economic evaluation.

Cost to helicopter air ambulance operators to establish procedures to evaluate, analyze, and use additional VFR flight planning in their operations manuals

Air ambulance helicopters = 989

Operations per year per aircraft = 367

Time needed for the flight planning = 5/60 hour

Salary of helicopter pilot = \$48 per hours

First-year cost

Cost: $989 \times 367 \times (5/60) \times \$48 = \$1,451,852$

Time: $989 \times 367 \times (5/60) = 30,247$ hours

Subsequent years: Per-year costs

Cost: $989 \times 367 \times (5/60) \times \$48 = \$1,451,852$

Time: $989 \times 367 \times (5/60) = 30,247$ hours

Total over 10 years

Cost: $\$1,451,852 \times 10 = \$14,518,520$

Time: $30,247 \text{ hours} \times 10 = 302,470$ hours

Average per year

Cost: $\$14,518,520 / 10 = \$1,451,852$

Time: $302,470 \text{ hours} / 10 = 30,247$ hours

(4) Light-weight aircraft recording system (LARS) on helicopter air ambulances: The FAA is seeking comment on whether to require that certificate holders install LARS on their helicopter air ambulances and outline procedures for evaluating and using LARS data in their operations manuals.

The following estimate corresponds to section A.2.b. of the economic evaluation.

One-time cost to helicopter air ambulance operators to install LARS

Helicopter air ambulances = 989

Unit cost to equip with LARS= \$6,450

First-year cost

Cost: $989/3 \times \$6,450 = \$2,126,350$

Subsequent 2 years: Per-year costs

Cost= $989/3 \times \$6,450 = \$2,126,350$

Total over 10 years

Cost= $\$2,126,250 \times 3 = \$6,379,050$

Average per year

Cost= $\$6,349,050 / 10 = \$637,905$

Cost for LARS software

Helicopter air ambulances = 989

Cost for LARS software= \$750

First-year cost

Cost= $989/3 \times \$750 = \$247,250$

Second-year cost

Cost= $989 \times (2/3) \times \$750 = \$494,500$

Subsequent years: Per-year costs

Cost= $989 \times \$750 = \$741,750$

Total over 10 years

Cost= $\$247,250 + \$494,500 + \$741,750 \times 8 = \$6,675,750$

Average per year

Cost= $\$6,675,750/10 = \$667,575$

Cost to helicopter air ambulance operators to establish procedures to evaluate, analyze, and use LARS data in their operations manuals

Air ambulance operators = 73

Time needed for chief pilot = 2 hours

Time needed for a clerical person = 6 hours

Salary of chief pilot = \$53 per hour

Salary of clerical person = \$26

First-year cost

Cost: $[73 \times 2 \times \$53] + [73 \times 6 \times \$26] = \$19,126$

Time: $[73 \times 2] + [73 \times 6] = 584$ hours

Subsequent years: Per-year costs

Cost: \$0

Time: 0 hours

Total over 10 years

Cost: \$19,126

Time: 584 hours

Average per year

Cost: $\$19,126 / 10 = \$1,913$

Time: $584 \text{ hours} / 10 = 58.4$ hours

(5) Require that medical personnel on board helicopter air ambulance flights either receive a supplemental safety briefing or safety training in lieu of a pre-flight briefing

(§135.619): Certificate holders choosing the option to provide safety training would be required to retain training records on those employees.

The following estimate corresponds to section A.1.e. of the economic evaluation.

Cost to certificate holder for documenting the training provided to medical personnel

Medical personnel = 10,965

Time needed for a clerical person to document the training = 5/60 hour

Salary of Clerical Person = \$26 per hour

First-year cost

Cost: $10,965 \times (5/60) \times \$26 = \$23,758$

Time: $10,965 \times (5/60) = 914$ hours

Subsequent years: Per-year costs

Cost: $10,965 \times (5/60) \times \$26 = \$23,758$

Time: $10,965 \times (5/60) = 914$ hours

Total over 10 years

Cost: $\$23,758 \times 10 = \$237,580$

Time: $914 \text{ hours} \times 10 = 9,140$ hours

Average per year

Cost: $\$237,580 / 10 = \$23,758$

Time: $9,140 \text{ hours} / 10 = 914$ hours

(6) Require preparation of a load manifest by operators of all aircraft (not limited to multiengine aircraft) operated under part 135 (§135.63): This would amend existing OMB Control Number 2120-0039 by expanding the applicability from multiengine aircraft to all aircraft. The following, therefore, addresses single-engine aircraft only.

The following estimate corresponds to section C.2. of the economic evaluation.

Air ambulance aircraft (single-engine) = 108

Commercial aircraft (single-engine) = 3,752

Average number of takeoffs daily = 3

Technical time per takeoff = 5/60 hour

Salary of single-engine pilot = \$38 per hour

First-year cost

$$\text{Cost} = [(108) \times (3) \times (365) \times (5/60) \times (\$38)] + [(3,752) \times (3) \times (365) \times (5/60) \times (\$38)] = \$13,384,550$$

$$\text{Time} = [(108) \times (3) \times (365) \times (5/60)] + [(3,752) \times (3) \times (365) \times (5/60)] = 352,225 \text{ hours}$$

Subsequent years: Per-year costs

$$\text{Cost} = [(108) \times (3) \times (365) \times (5/60) \times (\$38)] + [(3,752) \times (3) \times (365) \times (5/60) \times (\$38)] = \$13,384,550$$

$$\text{Time} = [(108) \times (3) \times (365) \times (5/60)] + [(3,752) \times (3) \times (365) \times (5/60)] = 352,225 \text{ hours}$$

Total over 10 years

$$\text{Cost} = \$13,384,550 \times 10 = \$133,845,500$$

$$\text{Time} = 352,225 \text{ hours} \times 10 = 3,522,250 \text{ hours}$$

Average per year

$$\text{Cost} = \$133,845,500 / 10 = \$13,384,550$$

$$\text{Time} = 3,522,250 \text{ hours} / 10 = 352,225 \text{ hours}$$

(7) Require that operations control specialists would be subject to certificate holders' drug and alcohol testing programs (§§120.105 and 120.215): The FAA believes that, because certificate holders currently administer and maintain records for drug and alcohol testing for other employees (approved under OMB Control Number 2120-0535), the cost for a clerical person to maintain these records would be negligible.

Summary of all Burden Hours and Costs:

	Section	Burden Hours	Cost	Number of years	Total Burden Hours	Total Cost
1. Operations Control Specialists' Training	135.617	24.0	\$624	10	240	\$6,240
2. VFR Flight Planning	135.613	30,247	\$1,451,852	10	302,470	\$14,518,520
3. Developing Pre-flight Risk Analysis	135.615	4,380	\$210,240	1	4,380	\$210,240
4. Performing Risk Analysis	135.615	60,494	\$2,903,704	10	604,940	\$29,037,040
5. Establish LARS Procedures		584	\$19,126	1	584	\$19,126
6. LARS Equipment		0	\$2,126,350	3	0	\$6,379,050
7. LARS Software		0	\$667,575	10	0	\$6,675,750
8. Training to Medical Personnel	135.619	914	\$23,758	10	9,140	\$237,580
9. Load Manifest	135.63	352,225	\$13,384,550	10	3,522,250	\$133,845,500
			GRAND TOTALS		4,444,004	\$190,929,046
			Average per year		444,400	\$19,092,905

The agency is soliciting comments to—

(1) Evaluate whether the proposed information requirement is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility;

(2) Evaluate the accuracy of the agency's estimate of the burden;

(3) Enhance the quality, utility, and clarity of the information to be collected; and

(4) Minimize the burden of collecting information on those who are to respond, including by using appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology.

Individuals and organizations may send comments on the information collection requirement by [INSERT DATE 90 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER], and should direct them to the address listed in the “ADDRESSES” section at the beginning of this preamble. Comments also should be submitted to the Office of Management and Budget, Office of Information and Regulatory Affairs, Attention: Desk Officer for FAA, New Executive Building, Room 10202, 725 17th Street, NW, Washington, DC 20053.

According to the 1995 amendments to the Paperwork Reduction Act (5 CFR 1320.8(b)(2)(vi)), an agency may not collect or sponsor the collection of information, nor may it impose an information collection requirement unless it displays a currently valid OMB control number. The OMB control number for this information collection will be published in the Federal Register, after the Office of Management and Budget approves it.

V. International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to conform to International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and has identified no differences with these proposed regulations.

VI. Regulatory Evaluation, Regulatory Flexibility Determination, International Trade Assessment, and Unfunded Mandates Assessment

Regulatory Evaluation

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 (Public Law 96-354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Public Law 96-39) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, this Trade Act requires agencies to consider international standards and, where appropriate, that they be the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Public Law 104-4) requires

agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of \$100 million or more annually (adjusted for inflation with base year of 1995). This portion of the preamble summarizes the FAA's analysis of the economic impacts of this proposed rule. Readers seeking greater detail should read the full regulatory evaluation, a copy of which is in the docket for this rulemaking.

In conducting these analyses, FAA has determined that this proposed rule: (1) has benefits that justify its costs; (2) is not an economically "significant regulatory action" as defined in section 3(f) of Executive Order 12866; (3) would be otherwise "significant" as defined in Executive Order 12866 and DOT's Regulatory Policies and Procedures; (4) would have a significant economic impact on a substantial number of small entities; (5) would not create unnecessary obstacles to the foreign commerce of the United States; and (6) would not impose an unfunded mandate on state, local, tribal governments, or on the private sector by exceeding the threshold identified above. These analyses are summarized below.

The estimated mean benefit value for the air ambulance provisions is \$270 million or \$160 million present value over the next 10 years. The estimated mean benefit value for the commercial provisions is \$193 million or \$115 million present value over the next 10 years. The FAA estimates the cost of this proposed rule for the air ambulance provisions would be approximately \$210 million (\$136 million, present value) over the next 10 years. The estimated cost of the proposed rule for the commercial provisions would be approximately \$145 million (\$89 million, present value) over the next 10 years.

As noted in the full regulatory evaluation, the FAA is unable to estimate the costs of provisions A.1.a, A.3.b, and B.2.a. The FAA calls for comments from affected entities

requesting that all comments be accompanied by clear and detailed supporting economic documentation.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) establishes “as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation.” To achieve that principle, the RFA requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The RFA covers a wide-range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions. The FAA invites public comment on its RFA analysis, as detailed below, particularly with respect to the number of small entities impacted, the costs for small entities, and alternatives to the proposed rule that would meeting the agency’s statutory objectives in a less burdensome manner.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the agency determines that it will, the agency must prepare a regulatory flexibility analysis as described in the Act.

This proposed rule would impact air ambulance, air tour, and on demand operators. The U.S. Small Business Administration (SBA) classifies businesses as small based on size standards, typically expressed in terms of annual revenue or number of employees. SBA publishes a table of small business size standards matched to North American Industry Classification System (NAICS) codes. Table 1 shows the size standards for the entities that would be affected by this rule.

Table 1. SBA Size Standards			
NAICS Codes	NAICS U.S. Industry Title	Affected Entity	Annual Revenue or Employee Threshold for Small Business
481219	Other nonscheduled air transportation	Air ambulance operators	<\$7 million
487990	Scenic and sightseeing transportation, other	Air tour operators	<\$7 million
481211	Nonscheduled chartered passenger air transportation	On demand operators	<1,500 employees

Because the FAA did not have actual annual revenues for air ambulance operators, the agency estimated them using helicopter counts as a revenue driver. The FAA assumed an average of 367 operations per year for each helicopter and a revenue charge of \$7,000 per operation. As such, the FAA estimated that 28 small air ambulance operators (with estimated revenues lower than \$7 million) out of the 73 air ambulance operators would be affected by this proposed regulation. Their annualized cost per operation⁴⁴ ranges between \$123 and \$131. Their ratio of annualized cost to annual revenue ranges between 1.76% and 1.88%, which is significant.⁴⁵ This proposal would impact approximately 18 not-for-profit air ambulance operators. Accordingly, the FAA prepared a regulatory flexibility analysis for small air ambulance operators, as described in the next section.

For air tour operators, the FAA assumed an average of 747 operations per year for each helicopter and a revenue charge of \$1,700 per operation. As such, the FAA identified 31 small air tour operators (with estimated revenues lower than \$7 million) out of the 43 air tour operators that would be affected by this regulation. Their annualized cost per operation ranges between \$10 and \$24. Their ratio of annualized cost to annual revenue ranges between 0.58% and 1.42%, which may be significant. Accordingly, the FAA prepared a regulatory flexibility analysis for small air tour operators, as described in the next section.

The FAA identified 379 small on demand operators (with 1,500 or fewer employees) out of the 380 on demand operators that would be affected by this proposed regulation. Although

⁴⁴ Annualized cost per operation equals total annualized costs divided by number of helicopter air ambulance operations per year. Total annualized cost equals present value cost over 10 years times capital recovery factor.

their annualized compliance costs ranges between \$6,752 and \$642,020, the agency is unable to estimate their annual revenues because average revenue per operation for these entities is not meaningful. There are a number of factors (e.g., length of flight, type of helicopter) that determine the revenue for an individual operation. These factors are not likely to result in a distribution around a meaningful average revenue. The FAA seeks comment on the impact to on demand operators as a result of this proposal.

Regulatory Flexibility Analysis

Under section 603(b) of the RFA (as amended), each regulatory flexibility analysis is required to address the following points: (1) reasons the agency considered the proposed rule, (2) the objectives and legal basis for the proposed rule, (3) the kind and number of small entities to which the proposed rule would apply, (4) the reporting, recordkeeping, and other compliance requirements of the proposed rule, (5) all Federal rules that may duplicate, overlap, or conflict with the proposed rule, and (6) alternatives to the proposed rule.

Reasons The FAA Considered The Rule

See section II. Background.

The Objectives And Legal Basis For The Rule

The FAA's authority to issue rules on aviation safety is found in Title 49 of the United States Code. This rulemaking is promulgated under the authority described in 49 U.S.C. 44701(a)(4), which requires the Administrator to promulgate regulations in the interest of safety

⁴⁵ This is a lower bound estimate because the FAA was unable to estimate the costs of several requirements.

for the maximum hours or periods of service of airmen and other employees of air carriers, and 49 U.S.C. 44701(a)(5), which requires the Administrator to promulgate regulations and minimum standards for other practices, methods, and procedures necessary for safety in air commerce and national security. As discussed throughout this document, the proposal aims to improve safety for air ambulance operations and other commercial helicopter operations.

The Kind And Number Of Small Entities To Which The Proposed Rule Would Apply

Based on a review of part 135 certificates and operations specifications, the FAA estimates 28 small air ambulance operators and 31 air tour operators that the proposed rule would impact. The agency estimates that these operators have annual revenues between \$1.3 million to \$6.3 million.⁴⁶

Reporting, Recordkeeping, And Other Compliance Requirements Of The Proposed Rule

Reporting, recordkeeping, and other compliance requirements are outlined in section IV. Paperwork Reduction Act. The FAA seeks comment on whether reporting, recordkeeping, and compliance costs vary from small to large entities.

All Federal Rules That May Duplicate, Overlap, Or Conflict With The Proposed Rule

The FAA is unaware of any Federal rules that duplicate, overlap, or conflict with the proposed rule.

Other Considerations

Affordability analysis

Aviation Week, World Aerospace Database, Winter, 2009.

For the purpose of this analysis, the degree to which small entities can afford the cost of the proposed rule is predicated on the availability of financial resources. Costs can be paid from existing assets such as cash, by borrowing, through the provision of additional equity capital, by accepting reduced profits, by raising prices, or by finding other ways of offsetting costs.

One means of assessing the affordability is the ability of each of the small entities to meet its short-term obligations, such as looking at net income, working capital and financial strength ratios. According to financial literature, a company's short-run financial strength is substantially influenced by its working capital position and its ability to pay short-term liabilities, among other things. However, the FAA was unable to find this type of financial information for the affected entities, and so used an alternative way of analyzing affordability. The approach used by the FAA was to compare estimated revenues with the annualized compliance costs.

Small air ambulance operators and air tour operators may have trouble absorbing the costs of complying with the proposed rule if their annualized costs exceed 5 percent of their estimated revenues. The idea is that if a business has such a high cost, percentage-wise, it would likely have trouble absorbing the costs of complying with the proposed rule. The average ratio of annualized cost to estimated annual revenue for small air ambulance operators and air tour operators ranges between 0.58% and 1.88%. Thus, the FAA expects that small air ambulances and air tour operators would not have trouble absorbing the costs of complying with this rule.

Related to this analysis, the FAA seeks comment on whether the economic impact on small entities is significant.

Competitiveness analysis

For small air ambulance and air tour operators, the ratio of annualized cost to estimated annual revenue ranges between 0.58% and 1.88%. For large air ambulance and air tour

operators, it ranges between 0.62% and 2.4%. The FAA expects that based on these results, there would be little change in the competitiveness of small air ambulance and air tour operators relative to large operators.

Alternatives

Alternative One - The current proposal would give certificate holders three years from the effective date to install all required pieces of equipment. This alternative would change the compliance date to four years after the effective rule date. This would help small business owners cope with the burden of the expenses because they would be able to integrate these pieces of equipment over a longer period of time.

Conclusion – This alternative is not preferred because it would delay safety enhancements. Thus, the FAA does not consider this to be an acceptable alternative in accordance with 5 U.S.C. 603(c).

Alternative Two- This alternative would exclude the HTAWS unit from the rulemaking proposal. Although this alternative would reduce annualized costs to small air ambulance operators by approximately 12% and the ratio of annualized cost to annual revenue would decrease from a range of between 1.76% and 1.88% to a range of between 1.55% and 1.65%, the annualized cost of the proposed rule would still be significant for all 35 small air ambulance operators. Since all 35 small air ambulance operators would still be significantly impacted by this alternative, the alternative not only does not eliminate the problem for a substantial number of small entities, but also it would reduce safety.

Conclusion - The HTAWS is an outstanding tool for situational awareness and to help helicopter air ambulance pilots during night time operations. This equipment is a great

enhancement for situational awareness in all aspects of flying including day, night, and instrument meteorological conditions. Therefore the FAA believes that this equipment is a significant enhancement for safety throughout all aspects of helicopter operations. The accident data shows that the HTAWS provision could have prevented many air ambulance accidents if this equipage was available at the time of the accident. Thus the FAA does not consider this to be an acceptable alternative in accordance with 5 U.S.C. 603(c).

Alternative Three - The alternative would increase the requirement of certificate holders from 10 to 15 helicopters or more that are engaged in helicopter air ambulance operations to have an Operations Control Center.

Conclusion – The FAA believes that operators with 10 or more helicopters engaged in air ambulance operations would cover 66% of the total population of the air ambulance fleet in the U.S. The FAA believes that operators with 15 or more helicopters would decrease the coverage of the population to 50%. Furthermore, complexity issues arise and considerably increase with operators of more than 10 helicopters. Thus the FAA does not consider this to be an acceptable alternative in accordance with 5 U.S.C. 603(c).

The FAA invites public comment on the conclusions reached with regard to the alternatives outlined above.

Conclusion

The FAA has determined that this proposed rule would have a significant impact on a substantial number of small helicopter air ambulance and air tour operators. Because the agency is unable to estimate annual revenues for on-demand operators, the FAA cannot determine whether the proposed rule would have a significant impact on a substantial number of on-demand operators. The FAA believes that small helicopter air ambulance and air tour operators

would be able to afford the proposed rule and would remain competitive. While small entities would likely be able to afford the proposal, the FAA seeks comment on whether small entities will be able to remain competitive under the proposal.

International Trade Impact Assessment

The Trade Agreements Act of 1979 (Public Law 96-39), as amended by the Uruguay Round Agreements Act (Public Law 103-465), prohibits Federal agencies from establishing standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, the establishment of standards is not considered an unnecessary obstacle to the foreign commerce of the United States, so long as the standard has a legitimate domestic objective, such the protection of safety, and does not operate in a manner that excludes imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. The FAA has assessed the potential effect of this proposed rule and determined that it would have only a domestic impact and therefore will not create unnecessary obstacles to the foreign commerce of the United States.

Unfunded Mandates Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (Public Law 104-4) requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of \$100 million or more (in 1995 dollars) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a “significant regulatory action.” The FAA currently uses an inflation-adjusted value of \$136.1 million in lieu of \$100 million. This

proposed rule does not contain such a mandate; therefore, the requirements of Title II of the Act do not apply.

VII. Executive Order 13132, Federalism

The FAA has analyzed this proposed rule under the principles and criteria of Executive Order 13132, Federalism. The agency determined that this action would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government, and, therefore, would not have federalism implications.

VIII. Regulations Affecting Intrastate Aviation in Alaska

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the Administrator, when modifying regulations in title 14 of the CFR in a manner affecting intrastate aviation in Alaska, to consider the extent to which Alaska is not served by transportation modes other than aviation, and to establish appropriate regulatory distinctions. Because this proposed rule would apply to helicopter air ambulance, commercial helicopter, and general aviation operations, the FAA specifically requests comments on whether there is justification for applying the proposed rule differently in intrastate operations in Alaska.

IX. Environmental Analysis

FAA Order 1050.1E identifies FAA actions that are categorically excluded from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act in the absence of extraordinary circumstances. The FAA has determined this proposed rulemaking action qualifies for the categorical exclusion identified in

paragraph 312f. Additionally, the FAA reviewed paragraph 304 of Order 1050.1E and determined that this rulemaking involves no extraordinary circumstances.

X. Regulations that Significantly Affect Energy Supply, Distribution, or Use

The FAA has analyzed this NPRM under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). The agency has determined that it is not a “significant regulatory action” under Executive Order 13211 because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. The NPRM is, however, “significant” under DOT’s Regulatory Policies and Procedures.

XI. Availability of Rulemaking Documents

You can get an electronic copy of rulemaking documents using the Internet by—

1. Searching the Federal eRulemaking Portal (<http://www.regulations.gov>);
2. Visiting the FAA’s Regulations and Policies web page at http://www.faa.gov/regulations_policies or
3. Accessing the Government Printing Office’s web page at <http://www.gpoaccess.gov/fr/index.html>.

You can also get a copy by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue S.W, Washington, DC 20591, or by calling (202) 267-9680. Make sure to identify the docket number, notice number, or amendment number of this rulemaking.

You may access all documents the FAA considered in developing this proposed rule, including economic analyses and technical reports, from the internet through the Federal eRulemaking Portal referenced in paragraph (1).

XI. Additional Information

Comments Invited

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views. We also invite comments relating to the economic, environmental, energy, or federalism impacts that might result from adopting the proposals in this document. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. To ensure the docket does not contain duplicate comments, please send only one copy of written comments, or if you are filing comments electronically, please submit your comments only one time.

We will file in the docket all comments we receive, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking. Before acting on this proposal, we will consider all comments we receive on or before the closing date for comments. We will consider comments filed after the comment period has closed if it is possible to do so without incurring expense or delay. We may change this proposal in light of the comments we receive.

Proprietary or Confidential Business Information

Do not file in the docket information that you consider to be proprietary or confidential business information. Send or deliver this information directly to the person identified in the FOR FURTHER INFORMATION CONTACT section of this document. You must mark the

information that you consider proprietary or confidential. If you send the information on a disk or CD ROM, mark the outside of the disk or CD ROM and also identify electronically within the disk or CD ROM the specific information that is proprietary or confidential.

Under 14 CFR 11.35(b), when we are aware of proprietary information filed with a comment, we do not place it in the docket. We hold it in a separate file to which the public does not have access, and we place a note in the docket that we have received it. If we receive a request to examine or copy this information, we treat it as any other request under the Freedom of Information Act (5 U.S.C. 552). We process such a request under the DOT procedures found in 49 CFR part 7.

APPENDIX TO THE PREAMBLE—ADDITIONAL ACCIDENTS DISCUSSIONS

The following is a list of accidents (listed with reference to the associated preamble discussions) illustrative of the type that the FAA believes this proposal may have prevented.

A. Helicopter Air Ambulance Operations

1. Operational Procedures

b. Operational Control Center

On July 13, 2004, a Bell 407 helicopter, operating under 14 CFR part 135, collided with trees resulting in fatal injuries to the pilot, medical personnel and patient on board. The pilot performed a weather check before accepting the flight and was provided flight monitoring by the Spartanburg County Communications 911 Department of the Spartanburg County Office of Emergency Services. The flight was conducted in night visual meteorological conditions were present, with mist and light fog prevailing in the area of the accident site. The accident pilot was not informed that other pilots had declined this mission due to fog. The NTSB cited the pilot's failure to maintain terrain clearance as the cause of the accident, and contributing factors

included “inadequate weather and dispatch information relayed to the pilot.” *See* NTSB Accident Report CHI04MA182 (Jan. 26, 2006).

d. Preflight risk analysis

On August 21, 2004, a Bell 407 helicopter, operating under 14 CFR part 135 and en route to Washoe Medical Center in Reno, Nevada, collided with mountainous terrain resulting in fatal injuries to the pilot, two medical personnel, the patient’s mother, and the infant patient. The pilot had a choice of two routes, and he chose the direct route over mountainous terrain instead of the route following the I-80 which was 10 minutes longer. The pilot chose the route through mountainous terrain. The NTSB noted that there was no indication that the pilot obtained a weather briefing before departure and that if he had “he would have likely learned of the cloud cover and light precipitation present along his planned route of flight.” The NTSB cited the pilot’s lack of maintaining sufficient clearance of mountainous terrain as the cause of this accident, and other contributing factors such as the pilot’s improper decision to take the direct route over mountainous terrain in dark night conditions. *See* NTSB Accident Report SEA04MA167 (Jan. 26, 2006).

On November 29, 1998, a McDonnell Douglas MD-900 helicopter, en route to St. Alphonsus hospital heliport in Boise, ID, and operating under 14 CFR part 135, struck unmarked transmission wires when departing from a car accident site resulting in major damage to four of the five main rotor blades. No injuries were sustained by the flight crew, medical personnel, or patient on board. The NTSB cited the pilot and ground crew’s failure to identify the existence of the wires as factors contributing to this accident. The FAA believes that a pre-flight review of the proposed landing site may have prevented this accident. *See* NTSB Accident Report SEA99LA016 (Jan. 11, 2000).

On November 19, 1993, a Bell 206L helicopter, operating under part 135 rules landed hard in the Atlantic Ocean resulting in fatal injuries to all three passengers and serious injuries to the pilot during nighttime conditions. The pilot, operating at night under VFR, encountered inadvertent IMC and crashed. The NTSB determined the cause of the accident was the pilot's continued VFR flight into IMC, and contributing factors included weather, dark night, and rough sea conditions. *See* NTSB Accident Report BFO94FA013 (Nov. 1, 1994).

2. Equipment Requirements

a. Helicopter terrain awareness and warning systems

On December 12, 1996, a Messerschmitt-Bolkow-Blohn BO-105CBS helicopter, operating under part 135, collided with terrain at night in instrument conditions while transporting a patient to a hospital in Rochester, NY. Witnesses observed that cloud cover and the isolated area made for a dark night with no discernable horizon. About two minutes after the pilot's departure for the hospital, the helicopter collided with terrain resulting in fatal injuries to all on board. The NTSB stated the cause for this accident was "the pilot's failure to maintain altitude/clearance from the terrain," and other factors relating to the accident included "darkness, low ceiling, rising terrain, and high wind condition." *See* NTSB Accident Report IAD97FA032 (Jul. 31, 2008).

b. Light-weight aircraft recording system (LARS)

On June 29, 2008, two Bell 407 helicopters collided in midair while approaching the Flagstaff Medical Center helipad. Both helicopters were destroyed, and all seven persons aboard the two aircraft were fatally injured. Day VMC prevailed. The NTSB determined that the probable cause of this accident was both helicopter pilots' failure to see and avoid the other helicopter on approach to the helipad. Contributing to the accident were the failure of the pilot

of one of the helicopters to follow arrival and noise abatement guidelines and the failure of the pilot of the other helicopter to follow communications guidelines." The NTSB noted that "had either operator established a formal flight-monitoring program, the use of non-standard procedures might have led the operators to take corrective action that could have prevented the two helicopters from arriving at the same helipad on different approach angles that particular day." *See* NTSB Accident Report DEN08MA116A/B (May 7, 2009).

On May 27, 1993, an Aerospatiale AS 350B helicopter, operating under 14 CFR part 135, crashed into terrain near Cameron, MO, resulting in fatal injuries to the pilot and patient and serious injuries to medical personnel. The NTSB found that the accident was a result of loss of engine power due to the failure of the second state turbine labyrinth seal. In its factual report, the NTSB noted that aircraft manufacturer representatives described that a crack could develop under thermal low cycle fatigue, then develop as "subsequent distortion leads to rub between the inner diameter of the hub and the inner turbine labyrinth lips." An appropriately equipped LARS could capture audio files for acoustic analysis of dynamic components in the event of an accident or incident. Such mechanical failures could be detectable by LARS equipped to record ambient audio files. *See* NTSB Accident Report CHI93FA182 (Jun. 24, 1994).

B. Commercial Helicopter Operations (including Air Ambulance Operations)

2. Equipment Requirements

a. Radar altimeter

On July 23, 2003, a Bell 206B helicopter, operating under 14 CFR part 135, crashed into the inside wall of the Waialeale Crater, Kauai, HI, fatally injuring the pilot and all four passengers. This sightseeing tour originated at the Lihue Airport in Kauai under VFR conditions. During the flight, the pilot encountered clouds and a low ceiling. The pilot

descended into the mountain side. The NTSB determined the probable cause of this accident was the pilot's failure to maintain "adequate terrain clearance/altitude while descending over mountainous terrain" and continued flight into adverse weather. The contributing factors were clouds and a low ceiling. *See* NTSB Accident Report LAX03FA241 (Sept. 14, 2007).

On January 10, 2005, a Eurocopter Deutschland GmbH EC-135 P2 helicopter, operating under part 91, crashed in the Potomac River, fatally injuring the pilot and paramedic and seriously injuring the flight nurse. During low-altitude cruise flight, the helicopter impacted water without any distress warning from the pilot. The NTSB noted the cause of this accident was "the pilot's failure to identify and arrest the helicopter's descent, which resulted in controlled flight into terrain." Other factors identified by the NTSB included the dark night conditions and a lack of an operable radio altimeter. NTSB Accident Report NYC05MA039 (Dec. 20, 2007).

3. Training — Recovery from Inadvertent Flight into IMC

On September 20, 1995, a Bell 206L helicopter, operating under 14 CFR part 91, was substantially damaged after the pilot inadvertently encountered IMC and lost control. The NTSB found that the pilot's failure to maintain control of the helicopter was the cause of this accident. It cited the pilot's inadvertent VFR flight into IMC conditions as a factor contributing to the accident. *See* NTSB Accident ID #CHI95LA327.

On December 23, 2003, an Augusta A109A helicopter, operated under part 91 en route to pick up a patient during a helicopter air ambulance operation, collided with mountainous terrain near Redwood Valley, CA, while trying to reverse course following an encounter with night IMC. The crash fatally injured all on board and destroyed the helicopter. The NTSB determined the cause of the accident was the pilot's improper in-flight planning and decision to

continue flight under visual flight rules into deteriorating weather conditions which resulted in an inadvertent in-flight encounter with IMC. *See* NTSB Accident ID #LAX04FA076.

List of Subjects

14 CFR Part 1

Air transportation.

14 CFR Part 91

Aircraft, Airmen, Aviation safety, Reporting and recordkeeping requirements.

14 CFR Part 120

Airmen, Alcohol abuse, Alcoholism, Alcohol testing, Aviation safety, Drug abuse, Drug testing, Operators, Reporting and recordkeeping requirements, Safety, Safety-sensitive, Transportation.

14 CFR Part 135

Air taxis, Aircraft, Airmen, Aviation safety, Incorporation by reference, Reporting and recordkeeping requirements.

The Proposed Amendment

In consideration of the foregoing, the Federal Aviation Administration proposes to amend chapter I of title 14, Code of Federal Regulations, as follows:

PART 1—DEFINITIONS AND ABBREVIATIONS

1. The authority citation for part 1 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

2. Amend §1.1 by revising the definition of “Extended over-water operation” to read as follows:

§1.1 General definitions.

* * * * *

Extended over-water operation means an operation over water at a horizontal distance of more than 50 nautical miles from the nearest shoreline.

* * * * *

PART 91—GENERAL OPERATING AND FLIGHT RULES

3. The authority citation for part 91 continues to read as follows:

Authority: 49 U.S.C. 106(g), 1155, 40103, 40113, 40120, 44101, 44111, 44701, 44704, 44709, 44711, 44712, 44715, 44716, 44717, 44722, 46306, 46315, 46316, 46504, 46506–46507, 47122, 47508, 47528–47531, articles 12 and 29 of the Convention on International Civil Aviation (61 Stat. 1180).

4. Amend §91.155 by revising paragraph (b)(1) to read as follows:

§91.155 Basic VFR weather minimums.

* * * * *

(b) * * *

(1) Helicopter. A helicopter may be operated clear of clouds if operated at a speed that allows the pilot adequate opportunity to see and avoid other air traffic or obstruction in time to avoid a collision, provided the visibility is at least—

- (i) One half statute mile during the day; or
- (ii) One statute mile at night.

* * * * *

PART 120—DRUG AND ALCOHOL TESTING PROGRAM

5. The authority citation for part 120 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40101–40103, 40113, 40120, 41706, 41721, 44106, 44701, 44702, 44703, 44709, 44710, 44711, 45101–45105, 46105, 46306.

6. Amend §120.105 by adding paragraph (i) to read as follows:

§120.105 Employees who must be tested.

* * * * *

(i) Operations control specialist duties.

7. Amend §120.215 by adding paragraph (a)(9) to read as follows:

§120.215 Covered employees.

(a) * * *

(9) Operations control specialist duties.

* * * * *

PART 135—OPERATING REQUIREMENTS: COMMUTER AND ON DEMAND OPERATIONS AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

8. The authority citation for part 135 continues to read as follows:

Authority: 49 U.S.C. 106(g), 41706, 40113, 44701–44702, 44705, 44709, 44711–44713, 44715–44717, 44722, 45101–45105.

9. Amend §135.1 by adding paragraph (a)(9) to read as follows:

§135.1 Applicability.

(a) * * *

(9) Helicopter air ambulance operations with medical personnel, as defined in §135.601

(b)(4), on board the aircraft.

* * * * *

10. Amend §135.63 by revising the introductory text of paragraph (c) and revising paragraph (d) to read as follows:

§135.63 Recordkeeping requirements.

* * * * *

(c) Each certificate holder is responsible for the preparation and accuracy of a load manifest containing information concerning the loading of the aircraft. The manifest must be prepared in duplicate unless the certificate holder receives a copy of the load manifest, by electronic or other means, at its principal operations base or at another location used by it and approved by the FAA prior to the aircraft's take off. The load manifest must be prepared before each take off and must include:

* * * * *

(d) The pilot in command of an aircraft for which a load manifest must be prepared must carry a copy of the completed load manifest in the aircraft to its destination and, unless the certificate holder receives a copy of the load manifest prior to take off as provided for in paragraph (c) of this section, arrange at the takeoff location for a copy to be sent to the certificate holder, retained in a suitable place at the takeoff location, or retained in another location approved by the FAA until the flight is complete. The certificate holder shall keep copies of completed load manifests for at least 30 days at its principal operations base, or at another location used by it and approved by the FAA.

11. Add §135.160 to read as follows:

§135.160 Radio altimeters for rotorcraft operations.

After [DATE 3 YEARS AFTER EFFECTIVE DATE OF THE FINAL RULE], no person may operate a rotorcraft unless that rotorcraft is equipped with an operable FAA-approved radio altimeter, or an FAA-approved device that incorporates a radio altimeter, unless otherwise authorized in the certificate holder's approved minimum equipment list.

12. Amend §135.167 by revising the section heading and the introductory text of paragraph (a) to read as follows:

§135.167 Emergency equipment: Extended over-water operations – Aircraft other than rotorcraft.

(a) Except where the FAA amends the operations specifications of the certificate holder to require the carriage of any or all specific items of the equipment listed below for any over-water operation, or allows a deviation for a particular extended over-water operation in response to an application by a certificate holder, no person may operate an aircraft other than a rotorcraft in extended over-water operations unless it carries, installed in conspicuously marked locations easily accessible to the occupants if a ditching occurs, the following equipment:

* * * * *

13. Add §135.168 to read as follows:

§135.168 Emergency equipment: Over-water and extended over-water operations – Rotorcraft.

(a) For purposes of this section, the following definitions apply—

(1) Over-water operation: A flight beyond autorotational distance from the shoreline.

(2) Shoreline means that area of the land adjacent to the water of an ocean, sea, lake, pond, river, or tidal basin that is above the high-water mark at which a rotorcraft could be landed safely. This does not include land areas which are unsuitable for landing such as vertical cliffs or land intermittently under water.

(b) Over-water operations. After [DATE 3 YEARS AFTER EFFECTIVE DATE OF THE FINAL RULE], except where the FAA amends the operations specifications of the certificate holder to require the carriage of all or any specific items of the equipment listed below, allows a deviation for a particular operation, or the over-water operation is necessary only for takeoff or landing, no person may operate a rotorcraft in over-water operations unless it carries, installed in conspicuously marked locations easily accessible to the occupants in the event of an emergency water landing, the following equipment:

(1) Approved life preservers equipped with an approved survivor locator light, which must be worn by each occupant of the rotorcraft from take off until the flight is no longer over water;

(2) One approved pyrotechnic signaling device;

(3) Enough life rafts of a rated capacity and buoyancy to accommodate the maximum number of occupants the rotorcraft is certificated to carry;

(4) An approved, automatically deployable, survival-type emergency locator transmitter (ELT) in each life raft. Batteries used in ELTs must be maintained in accordance with the following --

(i) Non-rechargeable batteries must be replaced when the transmitter has been in use for more than 1 cumulative hour or when 50 percent of their useful lives have expired, as established by the transmitter manufacturer under its approval. The new expiration date for replacing the batteries must be legibly marked on the outside of the transmitter. The battery useful life

requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals; or

(ii) Rechargeable batteries used in the transmitter must be recharged when the transmitter has been in use for more than 1 cumulative hour or when 50 percent of their useful-life-of-charge has expired, as established by the transmitter manufacturer under its approval. The new expiration date for recharging the batteries must be legibly marked on the outside of the transmitter. The battery useful-life-of-charge requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals;

(5) Each life raft required under this paragraph must be electronically deployable, or externally mounted and accessible, and equipped with—

- (i) One survival kit, appropriate for the route to be flown, or
- (ii) Contain at least the following--
 - (A) One approved day/night signaling device;
 - (B) One life raft repair kit;
 - (C) One bailing bucket;
 - (D) One signaling mirror;
 - (E) One police whistle;
 - (F) One raft knife;
 - (G) One inflation pump;
 - (H) One 75-foot retaining line;
 - (I) One magnetic compass;
 - (J) One dye marker or equivalent; and
 - (K) One fishing kit.

(c) Extended over-water operations. After [DATE 3 YEARS AFTER EFFECTIVE DATE OF THE FINAL RULE], except where the FAA amends the operations specifications of the certificate holder to require the carriage of all or any specific items of the equipment listed below or allows a deviation for a particular operation, no person may operate a rotorcraft in extended over-water operations unless it carries, installed in conspicuously marked locations easily accessible to the occupants in the event of an emergency water landing, the following equipment:

(1) Approved life preservers equipped with an approved survivor locator light, which must be worn by each occupant of the rotorcraft during the duration of the flight

(2) The equipment listed in paragraphs (b)(2) through (b)(4) of this section;

(3) One flashlight having at least two operable size “D” cell or equivalent batteries; and

(4) Each life raft required under this paragraph must be must be electronically deployable or externally mounted and accessible, and equipped with or contain at least the following—

(i) The equipment listed in paragraph (b)(5) of this section;

(ii) One radar reflector;

(iii) One canopy (for sail, sunshade, or rain catcher);

(iv) Two pints of water per each person the life raft is rated to carry, or one sea water desalting kit for each two persons the life raft is rated to carry; and

(v) One book on survival appropriate for the area in which the rotorcraft is operated.

(d) Passenger Briefing. Passengers carried in over-water or extended over-water operations must be briefed on the following:

(1) Procedures for fastening and unfastening seatbelts;

(2) Procedures for opening exits and exiting the rotorcraft;

- (3) Procedures for water ditching;
- (4) Requirements for the use of life preservers;
- (5) Procedures for emergency exit from the rotorcraft in the event of a water landing; and
- (6) The location and use of life rafts and other floatation devices prior to flight.

(e) Maintenance. The equipment required by this section must be maintained in accordance with §135.419.

(f) ELT Standards. The ELT required by paragraph (b)(4) of this section must meet the requirements in Technical Standard Order (TSO)-C126a. Technical Standard Order C126a, 406 MHz Emergency Locator Transmitter (ELT), December 17, 2008, is incorporated by reference into this section with the approval of the Director of the Office of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the U.S. Department of Transportation, Subsequent Distribution Office, DOT Warehouse M30, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785; telephone (301) 322-5377. Copies are also available on the FAA's website. Use the following link:

[http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/0/0ac772bbed9b95a586257523007629b3/\\$FILE/TSO-C126a.pdf](http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/0/0ac772bbed9b95a586257523007629b3/$FILE/TSO-C126a.pdf). All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030 or go to http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(g) ELT Alternative Compliance. Operators with an ELT required by paragraph (b)(4) of this section that meets a later version of TSO-C126a, or an ELT with an approved deviation under §21.609 of this chapter, also are in compliance with this section.

14. Revise §135.221 to read as follows:

§135.221 IFR: Alternate airport weather minima.

(a) Aircraft other than rotorcraft. No person may designate an alternate airport unless the weather reports or forecasts, or any combination of them, indicate that the weather conditions will be at or above authorized alternate airport landing minima for that airport at the estimated time of arrival.

(b) Rotorcraft. Unless otherwise authorized by the FAA, no person may include an alternate airport or heliport in an IFR flight plan unless appropriate weather reports or weather forecasts, or a combination of them, indicate that, at the estimated time of arrival at the alternate airport or heliport, the ceiling and visibility at that airport or heliport will be at or above the following weather minima –

(1) If, for that airport or heliport, an instrument approach procedure has been published in part 97 of this chapter, or a special instrument approach procedure has been issued by the FAA to the operator, the ceiling is 200 feet above the minimum for the approach to be flown, and visibility is at least 1 statute mile but never less than the minimum visibility for the approach to be flown.

(2) If, for the alternate airport or heliport, no instrument approach procedure has been published in part 97 of this chapter and no special instrument approach procedure has been issued by the FAA to the operator, the ceiling and visibility minima are those allowing descent from the MEA, approach, and landing under basic VFR.

15. Amend §135.267 by adding paragraph (g) to read as follows:

§135.267 Flight time limitations and rest requirements: Unscheduled one- and two-pilot crews.

* * * * *

(g) For purposes of this section the term “flight time” includes any helicopter air ambulance operation with medical personnel, as defined in §135.601, on board the helicopter.

16. Amend §135.271 by adding paragraph (j) to read as follows:

§135.271 Helicopter hospital emergency medical evacuation service (HEMES).

* * * * *

(j) For purposes of this section the term “flight time” includes any HEMES operations with medical personnel, as defined in §135.601, on board the helicopter.

17. Amend §135.293 by—

- a. Removing the word “and” from the end of paragraph (a)(7)(iii);
- b. Removing the period and adding “; and” in its place at the end of paragraph (a)(8);
- c. Adding paragraph (a)(9);
- d. Redesignating paragraphs (c) through (f) as paragraphs (d) through (g) respectively;

and

- e. Adding new paragraph (c).

The additions read as follows:

§135.293 Initial and recurrent pilot testing requirements.

(a) * * *

(9) For rotorcraft pilots, procedures for aircraft handling in flat-light, whiteout, and brownout conditions, including methods for recognizing and avoiding those conditions.

* * * * *

(c) Each competency check for a rotorcraft pilot must include a demonstration of the pilot's ability to maneuver the rotorcraft solely by reference to instruments. The check must

determine the pilot's ability to safely maneuver the rotorcraft into visual meteorological conditions following an inadvertent encounter with instrument meteorological conditions. For competency checks in non-IFR-certified rotorcraft, the pilot must perform such maneuvers as are appropriate to the rotorcraft's installed equipment, the certificate holder's operations specifications, and the operating environment.

* * * * *

§135.297 [Amended]

18. Amend §135.297 by removing the reference to “§135.293 (d)” and adding “§135.293 (e)” in its place in the last sentence of paragraph (c) introductory text.

19. Add subpart L to part 135 to read as follows:

Subpart L – Helicopter Air Ambulance Equipment, Operations, and Training Requirements

Sec.

- 135.601 Applicability and definitions.
- 135.603 Pilot-in-command qualifications.
- 135.605 Helicopter terrain awareness and warning system (HTAWS).
- 135.607 VFR minimum altitudes and visibility requirements.
- 135.609 IFR operations at locations without weather reporting.
- 135.611 VFR/visual transitions from instrument approaches.
- 135.613 VFR flight planning.
- 135.615 Pre-flight risk analysis.
- 135.617 Operations control centers.
- 135.619 Medical personnel briefing requirements.

Subpart L – Helicopter Air Ambulance Equipment, Operation, and Training Requirements

§135.601 Applicability and definitions.

(a) Applicability. This subpart prescribes the requirements applicable to each certificate holder conducting helicopter air ambulance operations.

(b) Definitions. For purposes of this subpart, the following definitions apply.

(1) Helicopter air ambulance means a helicopter used in helicopter air ambulance operations by a part 135 certificate holder authorized by the FAA to conduct helicopter air ambulance operations.

(2) Helicopter air ambulance operation means a flight, or sequence of flights, conducted for the purpose of transporting a person in need of medical care, or a donor organ, by helicopter air ambulance. This includes, but is not limited to—

(i) Flights conducted to position the helicopter at the site at which a patient or donor organ will be picked up;

(ii) Flights conducted to reposition the helicopter after completing the patient, or donor organ transport; and

(iii) Flights initiated for the transport of a patient or donor organ that are terminated due to weather or other reasons.

(3) Medical personnel means persons with medical training, including but not limited to a flight physician, a flight nurse, or a flight paramedic, who are carried aboard a helicopter during helicopter air ambulance operations in order to provide medical care.

(4) Mountainous means designated mountainous areas as defined in part 95 of this chapter.

(5) Non-mountainous means areas other than mountainous areas as defined in part 95 of this chapter.

§135.603 Pilot-in-command qualifications.

After [DATE 3 YEARS AFTER EFFECTIVE DATE OF THE FINAL RULE], no certificate holder may use, nor may any person serve as, a pilot in command of a helicopter air ambulance operation unless that person meets the requirements of §135.243 and holds a helicopter instrument rating or an airline transport pilot certificate with a category and class rating for that aircraft, that is not limited to VFR.

§135.605 Helicopter terrain awareness and warning system (HTAWS).

(a) No person may operate a helicopter in helicopter air ambulance operations after [DATE 3 YEARS AFTER EFFECTIVE DATE OF THE FINAL RULE], unless that helicopter is equipped with a helicopter terrain awareness and warning system (HTAWS) that meets the requirements in Technical Standard Order (TSO)–C194. Technical Standard Order (TSO)–C194 Helicopter Terrain Awareness and Warning System, December 17, 2008, is incorporated by reference into this section with the approval of the Director of the Office of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the U.S. Department of Transportation, Subsequent Distribution Office, DOT Warehouse M30, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785; telephone (301) 322-5377. Copies are also available on the FAA’s website. Use the following link:

http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/0/532109AB059EC23D8625762000573A1E?OpenDocument. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030 or go to

http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(b) Operators with HTAWS required by this section that meets a later version of TSO–C194, or HTAWS with an approved deviation under §21.609 of this chapter, also are in compliance with this section.

(c) The certificate holder’s Rotorcraft Flight Manual must contain appropriate procedures for –

- (1) The use of the HTAWS; and
- (2) Proper flight crew response to HTAWS audio and visual warnings.

§135.607 VFR minimum altitudes and visibility requirements.

Unless specified in the certificate holder’s operations specifications, when conducting helicopter air ambulance operations in Class G airspace with medical personnel on board, the following weather minima and visibility requirements apply—

- (a) In non-mountainous local flying areas —
 - (1) During the day, 800-foot ceiling and 2 statute miles visibility.
 - (2) At night—
 - (i) When equipped with an FAA-approved night-vision imaging system (NVIS) or an FAA-approved HTAWS, 800-foot ceiling and 3 statute miles visibility; or
 - (ii) When not equipped with an FAA-approved NVIS or an FAA-approved HTAWS, 1,000-foot ceiling and 3 statute miles visibility.
- (b) In non-mountainous cross-country flying areas—
 - (1) During the day, 800-foot ceiling and 3 statute miles visibility.
 - (2) At night—
 - (i) When equipped with an FAA-approved NVIS or an FAA-approved HTAWS, 1,000-foot ceiling and 3 statute miles visibility; or

- (ii) When not equipped with an FAA-approved NVIS or an FAA-approved HTAWS, 1,000-foot ceiling and 5 statute miles visibility.
- (c) In mountainous local flying areas —
 - (1) During the day, 800-foot ceiling and 3 statute miles visibility.
 - (2) At night—
 - (i) When equipped with an FAA-approved NVIS or an FAA-approved HTAWS, 1,000-foot ceiling and 3 statute miles visibility; or
 - (ii) When not equipped with an FAA-approved NVIS or an FAA-approved HTAWS, 1,500-foot ceiling and 3 statute miles visibility.
 - (d) In mountainous cross-country flying areas—
 - (1) During the day, 1,000-foot ceiling and 3 statute miles visibility.
 - (2) At night—
 - (i) When equipped with an FAA-approved NVIS or an FAA-approved HTAWS, 1,000-foot ceiling and 5 statute miles visibility; or
 - (ii) When not equipped with an FAA-approved NVIS or an FAA-approved HTAWS, 1,500-foot ceiling and 5 statute miles visibility.
 - (e) Each certificate holder must designate a local flying area for each base of operations at which helicopter air ambulance services are conducted, in a manner acceptable to the FAA, that must—
 - (1) Not exceed 50 nautical miles in any direction from the helicopter’s base of operations;
 - (2) Take into account man-made and natural geographic terrain features that are easily identifiable by the pilot in command and from which the pilot in command may visually determine a position at all times; and

(3) Take into account the operating environment and capabilities of the certificate holder's aircraft.

§135.609 IFR operations at locations without weather reporting.

(a) If a certificate holder is authorized to conduct helicopter IFR operations, the FAA may issue operations specifications to allow that certificate holder to conduct IFR operations at airports or heliports with an instrument approach procedure and at which a weather report is not available from the U.S. National Weather Service (NWS), a source approved by the NWS, or a source approved by the FAA, subject to the following limitations:

(1) In Class G airspace, IFR departures are authorized only after the pilot in command of the affected flight determines that the weather conditions at the departure point are at or above VFR minima in accordance with §135.607;

(2) The certificate holder must obtain a weather report from a weather reporting facility operated by the NWS, a source approved by the NWS, or a source approved by the FAA, that is located within 15 nautical miles of the destination landing area. In addition, the certificate holder must obtain the area forecast from the NWS, a source approved by the NWS, or a source approved by the FAA, for information regarding the weather observed in the vicinity of the destination landing area;

(3) Flight planning for IFR flights conducted under this paragraph must include selection of an alternate airport that meets the requirements of §§135.221 and 135.223; and

(4) All approaches must be at Category A approach speeds or those required for the type of approach being used.

(b) Each helicopter air ambulance operated under this section must be—

(1) Fully equipped and certified to conduct IFR operations under this part;

(2) Equipped with functioning severe weather-detection equipment, such as airborne weather radar or lightning detection;

(3) Equipped with an operable autopilot, if used in lieu of the second in command required by §135.101; and

(4) Equipped with navigation equipment appropriate to the approach to be flown.

(c) Each pilot in command who conducts operations under this section must—

(1) Have a current §135.297 pilot-in-command instrument proficiency check;

(2) Be certificated to conduct the permitted IFR operations;

(3) Be trained in accordance with the certificate holder's approved training program and annually complete an approved course that includes, but is not limited to—

(i) A review of IFR regulations found in this part and parts 1, 61, and 91 of this chapter, and IFR operations found in the Aeronautical Information Manual;

(ii) Interpreting weather, weather reports, and weather forecasts;

(iii) Reviewing instrument charts;

(iv) Crew resource management;

(v) Methods for determining weather observations by the pilot in command, including present visibility and ceilings; and

(vi) Approaches authorized under this section;

(4) Be qualified in accordance with the requirements of this part;

(5) Be current in all requirements to perform operations under IFR in the make or model of helicopter being used; and

(6) Be tested and checked on IFR operations at uncontrolled airports.

(d) Pilots conducting operations pursuant to this section may use the weather information obtained in paragraph (a) to satisfy the weather report and forecast requirements of §135.213 and §135.225(a).

(e) After completing a landing at the destination airport or heliport at which a weather report is not available, the pilot in command is authorized to determine if the weather meets the takeoff requirements of part 97 of this chapter or the certificate holder's operations specification, as applicable.

§135.611 VFR/visual transitions from instrument approaches.

(a) Transitions from IFR flight to VFR flight on approach to a heliport or landing area—

(1) If an approved visual segment exists as part of an approved instrument approach procedure, the appropriate associated minima on the approach chart apply.

(2) Unless authorized by the FAA, the following VFR weather minima apply when conducting an authorized IFR Point in Space (PinS) Copter Special Instrument Approach Procedure--

(i) If the proceed-VFR segment to the heliport of intended landing is within 1 nautical mile of the missed approach point, and is within the obstacle evaluation area, visibility must be at least 1 statute mile.

(ii) If the proceed-VFR segment is 3 nautical miles or less from the heliport or landing area and does not meet the requirements of paragraph (a)(1)(i) of this section, then--

(A) Day Operations: 600-foot ceiling / 2 statute miles visibility.

(B) Night Operations: 600-foot ceiling / 3 statute miles visibility.

(3) Unless authorized by the FAA, the following VFR weather minima apply when conducting an authorized IFR Standard or Special Instrument Approach Procedure and

transitions to VFR at the missed approach point that is 3 nautical miles or less from the heliport or landing area—

(i) Day Operations: 600-foot ceiling / 2 statute miles visibility.

(ii) Night Operations: 600-foot ceiling / 3 statute miles visibility.

(4) If the distance from the missed approach point to the heliport or landing area exceeds 3 nautical miles, the minimum altitudes and visibility requirements of §135.607 apply.

(b) Transitions from VFR to IFR upon departure from a heliport or landing area—

(1) A pilot may use the VFR weather minima of paragraph (a)(1) or (a)(2) of this section to depart a heliport or landing area if—

(i) The operator follows an FAA-approved obstacle departure procedure;

(ii) The operator has filed an IFR flight plan and obtains an IFR clearance upon reaching a predetermined location; and

(iii) The distance from the departure location to the point at which IFR clearance will be obtained does not exceed 3 nautical miles.

(2) If the operator cannot meet the departure requirements of paragraph (b)(1) of this section then the minimum altitudes and visibility requirements of §135.607 apply.

§135.613 VFR flight planning.

(a) Pre-flight: Prior to conducting VFR operations, the pilot in command must--

(1) Determine the minimum safe cruise altitude by evaluating the terrain and obstacles along the planned route of flight;

(2) Identify and document the highest obstacle along the planned route of flight; and

(3) Using the minimum safe cruise altitudes, determine the minimum required ceiling and visibility to conduct the planned flight by applying the weather minima appropriate to the

conditions of the planned flight, including the requirements of this subpart and the visibility and cloud clearance requirements of §91.155 (a) of this chapter, as applicable to the class of airspace for the planned flight.

(b) During flight: While conducting VFR operations, the pilot in command must ensure that all terrain and obstacles along the route of flight, except for take off and landing, can be cleared vertically by no less than the following:

(1) 300 feet for day operations.

(2) 500 feet for night operations.

(c) Re-routing the planned flight path: A pilot in command may deviate from the planned flight path as required by conditions or operational considerations. During such deviations, the pilot in command is not relieved from the weather or terrain/obstruction clearance requirements of this part and part 91 of this chapter. Re-routing, change in destination, or other changes to the planned flight that occur while the aircraft is on the ground at an intermediate stop require evaluation of the new route in accordance with paragraph (a) of this section.

(d) Operations manual: Each certificate holder must document its VFR flight planning procedures in its operations manual.

§135.615 Pre-flight risk analysis.

(a) Each certificate holder conducting helicopter air ambulance operations must establish, and document in its operations manual, an FAA-approved procedure for conducting pre-flight risk analyses that include at least the following items—

(1) Flight considerations, to include obstacles and terrain along the planned route of flight, landing zone conditions, and fuel requirements;

(2) Human factors, such as crew fatigue, life events, and other stressors;

(3) Weather, including departure, en route, destination, and forecasted;

(4) Whether another helicopter air ambulance operator has refused or rejected a flight request; and

(5) Strategies and procedures for mitigating identified risks, including procedures for obtaining and documenting approval of the certificate holder's management personnel to release a flight when a risk exceeds a level predetermined by the certificate holder.

(b) Each certificate holder must develop a pre-flight risk analysis worksheet to include, at a minimum, the items in paragraph (a) of this section.

(c) Prior to the first leg of each helicopter air ambulance operation, the pilot in command must conduct and document on the risk analysis worksheet a pre-flight risk analysis in accordance with the certificate holder's FAA- approved procedures. The pilot in command must sign the risk analysis worksheet and specify the date and time it was completed.

(d) The certificate holder must retain the original or a copy of each completed pre-flight risk analysis worksheet at a location specified in its operations manual for at least 90 days from the date of the operation.

§135.617 Operations control centers.

(a) After [DATE 2 YEARS AFTER THE EFFECTIVE DATE OF THE FINAL RULE] certificate holders authorized to conduct helicopter air ambulance operations, with 10 or more helicopter air ambulances assigned to the certificate holder's operations specifications, must have an operations control center, staffed by operations control specialists who, at a minimum—

(1) Provide two-way communications with pilots;

(2) Provide pilots with weather briefings, to include current and forecasted weather along the planned route of flight;

(3) Monitor the progress of the flight; and

(4) Participate in the pre-flight risk analysis required under §135.615 to include the following:

(i) Ensure pilot has completed all required items on the FAA-approved pre-flight risk analysis form;

(ii) Confirm and verify all entries on pre-flight risk analysis form;

(iii) Assist the pilot in mitigating any identified risk prior to take off; and

(iv) Acknowledge in writing, specifying the date and time, that the risk analysis worksheet has been accurately completed and that, according to their professional judgment, the flight can be conducted safely.

(b) Each certificate holder conducting helicopter air ambulance operations must provide enough operations control specialists at each operations control center to ensure proper operational control of each flight.

(c) Each certificate holder must describe in its operations manual the duties and responsibilities of operations control specialists, including pre-flight risk mitigation strategies and control measures, shift change checklist, and its training and testing procedures to hold the position, including procedures for retesting.

(d) No certificate holder may use, nor may any person serve as, an operations control specialist unless that person has satisfactorily completed the training required by paragraph (e) of this section.

(e) No person may perform the duties of an operations control specialist before completing the certificate holder's FAA-approved operations control specialist training program and passing an FAA-approved written knowledge and a practical test given by the certificate holder as required by this paragraph. No person may continue performing the duties of an

operations control specialist unless that person has completed the certificate holder's FAA-approved recurrent training program and passed an FAA-approved written knowledge test and a practical test given by the certificate holder as required by this paragraph.

(1) Initial training must include a minimum of 80 hours of training on the topics listed in paragraph (g) of this section. A certificate holder may reduce the number of hours of initial training to a minimum of 40 hours for persons who have obtained, at the time of beginning initial training, a total of at least 2 years of experience during the last 5 years in any one or in any combination of the following areas—

- (i) In military aircraft operations as a pilot, flight navigator, or meteorologist;
- (ii) In air carrier operations as a pilot, flight engineer, certified aircraft dispatcher, or meteorologist; or
- (iii) In aircraft operations as an air traffic controller or a flight service specialist.

(2) Each operations control specialist must receive a minimum of 40 hours of recurrent training on the topics listed in paragraph (g) of this section and pass an FAA approved written knowledge test and practical test given by the certificate holder on those topics within the calendar month of the anniversary of passing the initial practical test. Recurrent training and examinations may be completed in the calendar month before, the calendar month of, or the calendar month after they are due.

(f) The certificate holder must maintain a training record for each operations control specialist employed by the certificate holder for the duration of that individual's employment and for 90 days thereafter. Each training record must include a chronological log of all instructors, subjects covered, and course examinations and results.

(g) Each certificate holder must have an FAA-approved operations control specialist training program that covers at least the following topics—

- (1) Aviation weather, to include:
 - (i) General meteorology;
 - (ii) Prevailing weather;
 - (iii) Adverse and deteriorating weather;
 - (iv) Windshear;
 - (v) Icing conditions;
 - (vi) Use of aviation weather products;
 - (vii) Available sources of information; and
 - (viii) Weather minima;
- (2) Navigation, to include:
 - (i) Navigation aids;
 - (ii) Instrument approach procedures;
 - (iii) Navigational publications; and
 - (iv) Navigation techniques;
- (3) Flight monitoring, to include:
 - (i) Available flight-monitoring procedures; and
 - (ii) Alternate flight-monitoring procedures;
- (4) Air traffic control, to include:
 - (i) Airspace;
 - (ii) Air traffic control procedures;
 - (iii) Aeronautical charts; and
 - (iv) Aeronautical data sources;
- (5) Aviation communication, to include:
 - (i) Available aircraft communications systems;

- (ii) Normal communication procedures;
- (iii) Abnormal communication procedures; and
- (iv) Emergency communication procedures;
- (6) Aircraft systems, to include:
 - (i) Communications systems;
 - (ii) Navigation systems;
 - (iii) Surveillance systems;
 - (iv) Fueling systems;
 - (v) Specialized systems;
 - (vi) General maintenance requirements; and
 - (vii) Minimum equipment lists;
- (7) Aircraft limitations and performance, to include:
 - (i) Aircraft operational limitations;
 - (ii) Aircraft performance;
 - (iii) Weight and balance procedures and limitations; and
 - (iv) Landing zone and landing facility requirements;
- (8) Aviation policy and regulations, to include:
 - (i) 14 CFR parts 1, 27, 29, 61, 71, 91, and 135;
 - (ii) 49 CFR part 830;
 - (iii) Company operations specifications;
 - (iv) Company general operations policies;
 - (v) Enhanced operational control policies;
 - (vi) Aeronautical decision making and risk management;
 - (vii) Lost procedures; and

(viii) Emergency and search and rescue procedures, including plotting coordinates in degrees, minutes, seconds format, and degrees, decimal minutes format;

(9) Crew resource management, to include:

(i) Concepts and practical application;

(ii) Risk management and risk mitigation; and

(iii) Pre-flight risk analysis procedures required under §135.615;

(10) Local flying area orientation, to include:

(i) Terrain features;

(ii) Obstructions;

(iii) Weather phenomena for local area;

(iv) Airspace and air traffic control facilities;

(v) Heliports, airports, landing zones, and fuel facilities;

(vi) Instrument approaches;

(vii) Predominant air traffic flow;

(viii) Landmarks and cultural features, including areas prone to white out or brown out conditions; and

(ix) Local aviation and safety resources and contact information; and

(11) Any other requirements as determined by the FAA to ensure safe operations.

(h) Operations control specialist duty time limitations.

(1) Each certificate holder must establish the daily duty period for an operations control specialist so that it begins at a time that allows that person to become thoroughly familiar with operational considerations, including existing and anticipated weather conditions in the area of operations, helicopter operations in progress, and helicopter maintenance status, before performing duties associated with any helicopter air ambulance operation. The operations

control specialist must remain on duty until each helicopter air ambulance monitored by that person has completed its flight, has gone beyond that person's jurisdiction, or the operations control specialist is relieved by another qualified operations control specialist.

(2) Except in cases where circumstances or emergency conditions beyond the control of the certificate holder require otherwise—

(i) No certificate holder may schedule an operations control specialist for more than 10 consecutive hours of duty;

(ii) If an operations control specialist is scheduled for more than 10 hours of duty in 24 consecutive hours, the certificate holder must provide that person a rest period of at least 8 hours at or before the end of 10 hours of duty;

(iii) If an operations control specialist is on duty for more than 10 consecutive hours, the certificate holder must provide that person a rest period of at least 8 hours before that person's next duty period;

(iii) Each operations control specialist must be relieved of all duty with the certificate holder for at least 24 consecutive hours during any 7 consecutive days.

(i) Drug and Alcohol Testing. Operations control specialists must be tested for drugs and alcohol according to the certificate holder's Drug and Alcohol Testing Program administered under part 120 of this chapter.

§135.619 Medical personnel briefing requirements.

(a) Except as provided in paragraph (b) of this section, prior to each helicopter air ambulance operation, each pilot in command, or other flight crewmember designated by the certificate holder, must ensure that all medical personnel have been—

(1) Briefed on the topics included in §135.117(a) and (b); and

(2) Briefed on the following topics –

(i) Physiological aspects of flight;

(ii) Patient loading and unloading;

(iii) Safety in and around the aircraft;

(iv) In-flight emergency procedures;

(v) Emergency landing procedures;

(vi) Emergency evacuation procedures;

(vii) Efficient and safe communications with the pilot; and

(viii) Operational differences between day and night operations, if appropriate.

(b) The briefing required in paragraph (a)(2) of this section may be omitted if all medical personnel on board have satisfactorily completed the certificate holder's FAA-approved medical personnel training program within the preceding 24 calendar months. Each training program must include a minimum of 4 hours of ground training, and 4 hours of training in and around an air ambulance helicopter, on the topics set forth in paragraph (a)(2) of this section.

(c) Each certificate holder must maintain a record for each person trained under this section that—

(1) Contains the individual's name, the most recent training completion date, and a description, copy, or reference to training materials used to meet the training requirement; and

(2) Is maintained for 24 calendar months following the individual's completion of training, and for 60 days thereafter.

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