U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

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EMERGENCY MEDICAL SERVICES/AIRPLANE (EMS/A)	Initiated by: 11/19/90 AFS-250	Change: 135-15

1. **PURPOSE.** This Advisory Circular (AC) provides information and guidance material which may be used by Air Ambulance and Emergency Medical Service/Airplane (EMS/A) operators. It must be emphasized that this advisory circular diminishes neither the force nor the effect of the Federal Aviation Regulations (FAR). The regulations, of course, are always controlling. This document does not interpret the regulations; interpretations are issued only under established national Federal Aviation Administration (FAA) procedures.

2. **FOCUS.** These guidelines are applicable to EMS/A operations under FAR Part 135 and are also recommended for EMS operations conducted by public service and other operators.

3. **RELATED FAR SECTIONS.** FAR Parts 1, 23, 25, 43, 61, 65, 91, 135, and 157.

4. **RELATED READING MATERIAL.** Additional information may be found in the following AC's (as revised) and other listed publications.

a. FAA Documents:

(1) AC 91-42, as revised, Hazards of Rotating Propellers and Helicopter Rotor Blades.

(2) AC 120-27, as revised, Aircraft Weight and Balance.

(3) AC 120-49, Certification of Air Carriers.

(4) AC 135-5, as revised, Maintenance Program Approval for Carry-on Oxygen Equipment for Medical Purposes.

NOTE: Copies of (1) through (4) may be obtained free from the U.S. Department of Transportation, Distribution Requirements Section, M-443.2, Washington, DC 20590

(5) Pamphlet - DOT/FAA/DS--88-7, Risk Management for Air Ambulance Helicopter Operators. Copies may be purchased from National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161.

(6) Airman's Information Manual (AIM), Official Guide to Basic Flight Information and ATC Procedures, $20.00/year.

(7) AC 43.13-1A, Acceptable Methods, Techniques and Practices — Aircraft Inspection and Repair, dated April 17, 1972, #SN 050-007-00806-6, $18.00.

(8) AC 43.13-2A, Acceptable Methods, Techniques and Practices — Aircraft Alterations, dated June 9, 1977, #SN 050-007-00625-0, $5.50.

NOTE: Copies of (6) through (8) above may be purchased from: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

b. Other Documents.

(1) NFPA Publication 410-1980: Fire Protection/ Aircraft, may be obtained from: National Fire Protection Association (NFPA), Battery Park, Quincy, Massachusetts 02269.

(2) Air Ambulance Guidelines, DOT HS 806703 Revised May 1986, U.S. Department of Transportation, National Highway Traffic Safety Administration, may be obtained from: U.S. Department of Transportation, Distribution Requirements Section, M-443.2, Washington, DC 20590.

5. BACKGROUND. Transportation by aircraft of sick or injured persons may have originated during World War I when wounded were transported from battle fronts to field hospitals in an open cockpit biplane. Since that time, the transportation of patients needing medical attention has burgeoned into a significant industry operating modern aircraft equipped with state-of-the-art medical equipment carrying thousands of patients each year. The introduction of civil airplanes dedicated exclusively to EMS began about 1973. The operators of these aircraft can provide patient care while en route from city to city or from remote sites to urgent care facilities. Many airplane/air ambulance

flights are conducted with small, nondedicated aircraft operated by FAR Part 135 on-demand air carriers. There is also a contingent of private and public service aircraft operators conducting air ambulance flights. This AC provides guidance to operators conducting or planning EMS/A operations.

6. **DEFINITIONS.** This paragraph defines terms used for the purpose of this AC. Other definitions may be found in FAR Part 1, "Definitions and Abbreviations," and the "Pilot/Controller Glossary" supplement to the AIM.

a. Aeromedical Director. A licensed physician within an air ambulance service who is ultimately responsible for patient care during patient transport missions. The aeromedical director is responsible for assuring that appropriate medical personnel and equipment are provided for each patient.

b. Air Ambulance and/or EMS Airplane. An airplane designated for transportation of ambulatory patients or other patients requiring special care including, but not limited to, basic life support (BLS) or advanced life support (ALS). An air ambulance aircraft is equipped with the medical equipment necessary to support these levels of care in flight with trained medical personnel.

c. Air Ambulance Service and/or EMS. The use of an aircraft in transportation, for carriage of ambulatory or other patients requiring special care, including BLS or ALS, during flight, and/or transport of body organs for medical reasons. An air ambulance or EMS airplane may be used to transport patients deemed by medical personnel to require other special service not available on regular commercial air carrier or charter flights.

> **NOTE:** The service of providing transportation for body organs and no passengers can be considered a cargo operation.

d. Certificate Holding District Office (CHDO). The CHDO is the FAA Flight Standards District Office (FSDO) with responsibility for management of the air carrier's certificate and which is charged with the overall inspection and surveillance of the certificate holder's operations.

e. Flight Crewmember. A pilot, flight engineer, or flight navigator assigned to duty in an aircraft during flight time is considered a crewmember.

f. **Medical Personnel.** A person trained in air medical environment and assigned to perform medical duties during flight including, but not limited to, doctors, nurses, paramedics, respiratory therapists or emergency medical technicians. Medical personnel may also be trained and assigned to perform other duties by the certificate holder.

i. **Principal Avionics Inspector (PAI).** An FAA inspector assigned by the FAA Administrator to oversee the avionics functions of the certificate holder.

j. **Principal Maintenance Inspector (PMI).** An FAA inspector assigned by the FAA Administrator to oversee the maintenance functions of the certificate holder.

k. **Principal Operations Inspector (POI).** An FAA inspector assigned by the FAA Administrator to oversee the operations functions of a certificate holder.

l. **Public Aircraft.** An aircraft used only in the service of a government or a political subdivision. It does not include any government-owned aircraft engaged in carrying persons or property for commercial purposes.

> **NOTE:** Public Law 100-223, December 30, 1987, Section 207, Public Aircraft Defined. Section 101(36) has been amended thus: "For the purposes of this paragraph, used exclusively in the service of means, for other than the Federal Government, an aircraft which is owned or operated by a government entity for other than commercial purposes or which is exclusively leased by such government entity for not less than 90 continuous days."

> **NOTE:** Persons that exercise operational control over FAR Part 135 EMS/A missions must be listed in the operator's manual as required by FAR Section 135.77.

m. **Levels of Medical Care:**

(1) **Basic Life Support.** Refers to the air-medical provider offering airborne patients transport staffed by a minimum of one medical person who is experienced and qualified by training, certification, and current competency in BLS care.

This medical person practices through the orders of a physician-medical director and is supported by a medically configured aircraft capable of providing BLS systems (such as oxygen, suction, electrical supply, lighting, and climate control) to the patient. As used in this statement, BLS consists of a medical person capable of recognizing respiratory and cardiac arrest, starting and maintaining the proper medical procedures until the victim recovers, or the medical person stops procedures, or until ALS is available. In air medical transports, BLS includes air-to-ground communications to ensure continuity of care. ("Standards for CPR and ECG," JAMA, February 18, 1974.)

(2) **Advanced Life Support.** Refers to the air-medical provider offering airborne patients transport staffed by a minimum of two medical personnel who are experienced and qualified by training, certification, and current competency in emergency critical care. The medical personnel practice through the orders of a physician-medical director and are supported by a medically configured aircraft capable of providing life support systems (such as oxygen, suction, electrical supply, lighting, climate control, pressurization, etc.) to the patient. The following elements are recomended for ALS:

(i) BLS.

(ii) Using adjunctive equipment and special techniques, such as endotracheal intubation and closed chest cardiac compression.

(iii) Cardiac monitoring for dysrhythmia recognition and treatment.

(iv) Defibrillation.

(v) Establishing and maintaining an intravenous infusion lifeline.

(vi) Employing definitive therapy, including drug administration.

(vii) Stabilization of patient's condition.

NOTE: ALS includes: (1) air-to-ground communications to ensure continuity of care, and (2) the capability of constant monitoring and life support until the patient has been delivered to a continuing care facility. ("Standards for CPR and ECG," JAMA, February 18, 1974.)

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CHAPTER 1. CERTIFICATION

1. GENERAL. Aircraft operators desiring to commence Air Ambulance service as a FAR Part 135 air carrier who do not hold a FAR Part 135 air carrier certificate should refer to AC 120-49, Certification of Air Carriers, dated November 23, 1988, for methods and procedures to follow in the certification process. The Flight Standards District Office (FSDO) located in the area where the applicant desires to locate its principal business office will assist the applicant in becoming certificated. This chapter refers to added steps that may be required of an EMS/A operator to obtain a FAR Part 135 certificate.

> **NOTE:** For those operators presently conducting operations under FAR Part 135, new or revised operations specifications may be required prior to initiating EMS/A operations.

a. Inspections. Inspection at the principal base of operations will include items such as operations and maintenance facilities, equipment (including installation of special/medical equipment), lease agreements, and contract maintenance records. Before issuance of operations specifications authorizing FAR Part 135 operations, FSDO personnel will perform the following inspections to ensure that the applicant meets requirements for FAR Part 135 air carrier certification:

(1) Manuals to assure they contain information required by FAR Section 135.23.

(2) Recordkeeping system.

(3) Aircraft used in air transportation service.

> **NOTE:** Lease agreements are considered proprietary documents and will be handled with confidentiality by FAA personnel.

(4) Each certificate holder is responsible for the airworthiness of its aircraft (FAR Section 135.413). Operator and/or contract maintenance facilities may be inspected for compliance with the appropriate FAR. This particular inspection will be accomplished to determine adequacy of tools, spare parts, special tools, and that properly trained personnel are available.

b. **Additional Equipment/General.** The applicant should identify, in their initial application, any specialized equipment that may be used in EMS operations. The equipment should be installed in the aircraft in an acceptable method (using data approved by the aircraft manufacturer, an EMS equipment manufacturer, or the FAA Administrator). The FAA may approve add-on equipment installation after evidence of airborne test results are submitted from the aircraft operator, the Department of Transportation (DOT), Department of Defense, or an independent testing organization. Any equipment installed aboard the aircraft should comply with the data in AC 43.13-2A, Chapter 1, paragraph 2(d) and 3, and Chapter 12, paragraph 243(a), and withstand the following static loads in accordance with AC 43.13-1A:

(1) 9.0G forward, 6.6G downward, and 3.0G upward, and 1.5G sideward; and

(2) tie-down, 13.5G forward, 9.9G downward, 4.5G upward, 2.25G sideward.

(3) **Supplemental Type Certificate (STC) or Field Approval.** All items of additional equipment must be installed in accordance with the applicable FAR. The installation of additional equipment may require a STC or field approval by an airworthiness aviation safety inspector. It should be noted that the requirements for field approval are the same as for a STC. If the certificate holder is unsure of the requirements on the proposed equipment, they should contact the PMI before installation is initiated.

(4) **Maintenance Flight Test.** Certificate holder should ensure that the installation of all additional equipment is compatible with all previously installed aircraft systems. Aircraft navigation and communication equipment may have to be recalibrated after installation of any additional medical equipment. Before returning the aircraft to service after the installation of additional equipment, flight tests may have to be accomplished to determine if there is radio frequency/ electromagnetic interference (RFI/EMI) with any navigation, communication, or flight control systems. The flight tests should be accomplished in visual meteorological conditions. Tests should include all installed equipment as well as all items of carry-on medical equipment intended to be used for patient transport. Results of the flight tests verifying acceptability should be entered into the appropriate permanent records of the aircraft.

NOTE: Medical monitors may also be affected by the aircraft's electronic equipment; therefore, the medical monitors should be checked for accuracy by medical personnel before use with a patient.

c. Additional Equipment/Other. The following additional items of equipment are recomended for EMS operations:

(1) **Radios Capable of Air-to-Ground Communications.** To ensure a safe and satisfactory completion of transportation and to coordinate with ground transportation service when necessary for the patient.

(2) **Medical Oxygen System.** A medical oxygen system including bottles, lines, gauges, regulators, and other system components which has been installed by approved data on an aircraft becomes an "appliance." If a single servicing port is installed in accordance with AC 27-1, as revised, Certification of Normal Category Rotorcraft, or AC 29-2A, as revised, Certification of Transport Category Rotorcraft, the system may be serviced by any person trained by the certificate holder. An oxygen bottle installed in a rack in the cabin area having its own regulator, hose, and mask feeding directly to the patient may be removed and serviced by any person trained by the certificate holder. If servicing is accomplished by removing and replacing bottles or by disconnecting lines, regardless of the type fitting, it must be accomplished by an appropriately certified mechanic or repairman.

NOTE: Information concerning equipment installation in the referenced advisory circulars are applicable to airplanes and helicopters.

(3) **Supplemental Lighting Systems.** Some aircraft may require additional interior lighting since standard aircraft lighting may not be sufficient for adequate patient care. An emergency lighting system with a self-contained battery pack may be incorporated to allow for continued patient care and for emergency egress from the aircraft in the event of a primary electrical failure. A means to shield the cockpit from light in the patient area should be provided for night operations.

(4) **EMS Electrical Power.** All wiring, electrical components, and installation procedures must conform to the requirements of FAR Parts 23 or 25. An electrical load analysis must be performed to preclude an overload on the aircraft generating system. The system should be designed to give the pilot a fast means of shedding electrical load in an emergency situation.

(5) **Motor-driven Vacuum/Air Pumps.** Motors and/or pumps must be installed in accordance with FAR Parts 23 or 25. Any motor-driven device should be installed in a way to preclude contact with any flammable fluid, gas, or foreign materials that may cause heat buildup and possibly fire. Aircraft should be flight-tested with electrical motors running to check for RFI/EMI.

(6) **Incubators.** Incubators, balloon pumps, or other large carry-on medical equipment must be restrained in an appropriate manner to the following ultimate load factors:

(i) 3.0G upward, 6.6G downward; and

(ii) 9.0G forward, 1.5G sideward.

NOTE: If pull test data are not provided by the equipment manufacturer to verify that specific equipment can withstand the above loads, the certificate holder must demonstrate the above loads on each specific piece of equipment, or use an approved restraining device. Aircraft cargo straps or safety belts provide a satisfactory restraint in many instances. Also, mechanical (metallic) fasteners may be used for attachment.

NOTE: The incubator lid latches should withstand appropriate loads (approximately 15 pounds and any significant lid load). The operator should ensure the unit has minimum movement when secured if straps or belts are used. If the incubator includes features requiring electrical power, operation should be evaluated to assure there is no interference with the instruments and equipment that are required by the FAA airworthiness certificate for safe operation of the aircraft.

The operator should provide padding for the infant for forward and downward loads and movement. Mattresses and all padding used should be constructed in accordance with AC 25.853-1, Flammability Requirements for Aircraft Seat Cushions, dated September 17, 1986.

(7) **Stretchers (Litters).** Stretchers must be in compliance with FAR Section 23.785 with restraint devices meeting FAR Section 23.561. Restraining devices, including shoulder harnesses, must be available to ensure patient safety.

(8) **Child Restraint.** Infant seats provided must meet DOT/FAA restraint and securing criteria.

(9) **Intercom System (ICS).** An ICS should be provided for flight crewmembers and medical personnel to communicate with each other during flight. This is particularly important if the cabin noise level is above 72db and for those instances in which the cabin medical personnel need to talk immediately with the flightcrew regarding a patient's medical condition.

NOTE: If a master minimum equipment list has been approved that includes the above equipment, the installed items listed in (1) through (9) above in this paragraph should be included in the minimum equipment list.

d. Additional Equipment Installation. Many times in an airplane, equipment is installed for the purpose of patient care only. This equipment should be installed, using approved data, in racks that meet the g-loading requirements of an emergency landing. The racks should be removed and replaced by a certified FAA mechanic, but the medical equipment in the racks used for patient care should be installed so that it may be removed readily to accompany the patient. Instructions for removal and replacement should be contained in the operator's manual required by FAR Part 135.

(1) **The certificate holder must ensure that the installation of all additional equipment is compatible with the aircraft systems.** FAR Section 135.91(a)(1)(iv) requires that all installed equipment, including portable devices, be appropriately secured. The structure supporting the equipment must be designed

to restrain all loads (up to the ultimate inertia specified in the emergency provisions/emergency landing conditions) required by FAR Parts 23 and 25. Equipment installed aboard the aircraft should meet the static and dynamic loads specified in AC 27-1 and AC 29-2, as revised.

(2) **The installation of additional equipment by a STC or field approval.** Normally the STC should provide instructions and operational supplements, weight and balance data, and instructions for continued airworthiness.

(3) **Each installation must be evaluated at the time of its approval.** This is to determine if a mechanic is required to perform installation or if other personnel can be trained for removal and replacement of these items. Frequent removal and replacement may constitute maintenance and would require a certificated mechanic.

(4) **If an installation does not require tools** and can be performed in accordance with approved data and procedures in the operator's manual, any person trained by the certificate holder may be authorized to install the equipment.

2. RECORDS.

a. Maintenance Records. Each certificate holder must comply with the maintenance recording requirements of FAR Section 135.439. When aircraft are sold, the certificate holder must comply with FAR Section 135.441, Transfer of Maintenance Records.

b. Flight Records. Records required by FAR Section 135.63 must be kept at the certificate holder's principal business office, or at other operational locations approved by the Administrator. The following records should also be maintained at operational bases located at other than the principal business office:

(1) **Flight crewmember's flight time and rest records.** The flight time and rest records must contain information to show compliance with the flight, duty, and rest requirements of FAR Part 135, Subpart F.

(2) **A copy of the most recent competency and/or proficiency flight check.** For each pilot assigned to that particular location, a copy of the current flight/proficiency check should be available.

(3) **Current airworthiness documentation.** For the pilot to determine the acceptability of the aircraft before each flight, airworthiness documentation must be available.

(4) **Flight manifest records.** For each multiengine aircraft, flight manifest records must be maintained for a minimum of 30 days.

3. OPERATIONS SPECIFICATIONS.

a. Additional Requirements. FAR Part 135 certificate holders may use EMS procedures authorized with the appropriate operations specifications. The operations specifications may contain conditional authorizations that apply to individual operators. The approving authority for the operations specifications will be either the POI, PMI, or PAI of the FAA CHDO having jurisdiction over the certificate holder. The operations specifications include the following items:

(1) Location of all bases of operation where EMS activities will be performed.

(2) Exemptions, as appropriate.

(3) Deviations, as appropriate.

(4) Special authorizations.

b. Maintenance Operations Specifications. Operations specifications indicated in AC 120-49 are the same as those needed for EMS operations. However, in addition the following are items that should be considered:

(1) Special/medical and navigation/communication equipment, if appropriate to the operations being conducted.

(2) If the aircraft is being maintained under an Approved Aircraft Inspection Program, operations specifications must include the make, model, and registration number of the aircraft on that program.

c. **Weight and Balance.** A weight and balance program allowing the use of estimated weight for medical passengers will be authorized on operations specifications. The actual weight of medical personnel and flightcrew should be used for piston powered aircraft and aircraft of nine or less passengers. This program should be addressed in the operator's manual.

4. **FACILITIES.** The facilities include the business office required by FAR Section 135.27, maintenance area, and operational area. Items to be checked during FAA inspections should include the manual as required by FAR Section 135.21, as well as the operator's use of business names, aircraft, advertising, and area of operations.

a. **Maintenance.** Maintenance facilities should be large enough to accommodate the largest aircraft used by the certificate holder, adequately lighted, and properly equipped for required maintenance. Additional specialized equipment may be required for the EMS equipment installed in the aircraft. Contract maintenance will be performed in accordance with the procedures outlined in the operator's manual.

b. **Operations.** The operations facilities should have an area for flight planning, scheduling, flight following, training and recordkeeping. Classrooms and/or training devices should be available to flightcrews for recurrent training.

> **NOTE:** An aircraft shall be available in accordance with FAR Section 135.97 to enable each pilot to maintain and demonstrate ability to conduct all operations for which the pilot is authorized.

5. **MANUAL.** Each certificate holder conducting EMS operations should prepare a manual. Appropriate portions of the manual should be available in each aircraft and at each flight operations location. The following items are suggested for inclusion in the operator's manual as well as items identified in FAR Section 135.23:

a. Names of the EMS/A management personnel that have authority to act for the certificate holder.

b. Copy of the front page of the certificate holder's operations specifications.

c. Accident and incident notification procedures to include the local FAA, National Transportation Safety Board, and FAA CHDO telephone numbers.

d. Special actions or procedures that may be required during EMS flights.

e. Responsibilities and required coordination between medical personnel and flightcrew.

f. Special ground handling requirements.

g. Use of "Lifeguard" call sign during air ambulance/EMS flights.

h. Refueling procedures for normal and emergency situations.

> **NOTE:** Items listed in 5 a through h do not preclude a certificate holder from including other items in the operator's manual required by FAR Part 135.

CHAPTER 2. TRAINING

6. GENERAL. This chapter outlines recommended training for all EMS personnel including flight crewmembers and medical personnel.

a. Flight Crewmember. Because of the circumstances in which EMS work is accomplished, aircraft may be frequently assigned to fly in less than ideal weather conditions; i.e., night, low ceiling and/or low visibility, and into remote areas.

(1) Pilots should undergo regular recurrent training to ensure they will be familiar with all instrument flight procedures authorized on the operator's operations specifications. Since medical flights may use airports with no air traffic control (ATC) assistance, no-radar environment and limited facilities, pilots must be proficient in nonprecision approach procedures.

(2) A training program should be prepared that will address the possibility of a forced landing in a remote area. The program will address procedures relevant to the evacuation of a patient under extreme conditions related to a forced or precautionary landing.

(3) Training should also address procedures to be followed in the event of a fire or smoke in the cabin either while airborne or on the ground. Particular attention should be paid to the needs of the patient during and after evacuation.

b. Medical Personnel. Medical personnel assigned duty during flight should be instructed in the use of aviation terminology. Medical personnel should use aviation terminology to avoid confusion or misunderstandings of instructions from the flightcrew during the EMS mission.

(1) Medical personnel should also be trained to properly use, remove, and replace medical equipment installed on the aircraft.

(2) Medical personnel should be trained in physiological aspects of flight prior to being assigned duty during flight.

(3) Medical personnel should also be trained in aircraft evacuation and patient loading and unloading.

NOTE: The training program should consider the particular aircraft being used, and its safety features. A practice evacuation using emergency exits should be accomplished.

c. **Ground crew and other ground personnel (i.e., nurses, paramedics, etc).** EMS/A operations require stringent safety precautions around the aircraft especially during loading and unloading. The FAA recommends that each certificate holder develop a training program that encompasses, in addition to their normal training program, at least the following:

(1) Loading and unloading the aircraft.

(2) Use of visual cues for positioning and parking the aircraft (i.e., standard hand signals, communications, etc.). Medical personnel should be familiar with procedures to direct ambulances and ground equipment to the aircraft.

(3) A program coordinated with local authorities (e.g., fire and police departments) to deal with aircraft fuel spillage/leaks, aircraft fires, and other situations requiring emergency responses.

(4) Safe handling of oxygen equipment by all involved personnel. All personnel authorized to refill oxygen should be trained in the use of the recommended cascade system. If liquid oxygen (LOX) is to be used, the specific nature of LOX should be addressed.

NOTE: The FAA recommends that this program involve a licensed airframe and power plant mechanic to teach the correct procedures for handling oxygen equipment.

d. **Maintenance Personnel.** In addition to meeting the requirements of FAR Part 65, Certification: Airmen Other Than Flight Crewmembers, maintenance personnel should be trained by the manufacturers of the aircraft modification equipment, or in other maintenance training programs approved by the Administrator.

(1) **Inspection of installation,** as well as removal and reinstallation of special medical equipment, should be a part of this training.

(2) Supplemental Training. Training on servicing and maintenance of medical oxygen systems, along with characteristics of medical oxygen versus aviator-breathing oxygen, should be included in the training program.

NOTE: Recurrent training is recommended for all maintenance personnel.

e. Cockpit Resource Management (CRM). The FAA recommends that, when feasible, EMS/A flights be conducted under instrument flight rules (IFR) with two pilots. The FAA also recommends that a training program be established for CRM and use of checklists. Pilots should be trained in "challenge and response" methods of checklist use. First officers should be trained to assist the pilot as directed. Cockpit procedures should be developed that deal with emergencies where one pilot is designated to fly the aircraft while the second pilot tends to the emergency.

f. Judgment and Decisions. The decisionmaking process should have input from all elements involved in an EMS operation. Aeromedical directors, aircraft operators, the flightcrew, medical personnel, and ground crew contribute to this process. The degree of input from each element depends upon the type and complexity of every mission.

(1) Management personnel, including the aeromedical director, should be familiar with appropriate FAR and FAA guidelines related to safe operations. Management personnel should participate in the certificate holder's training program to gain knowledge concerning EMS/A operations.

(2) An essential element in flight operations is the timely decision to conduct a particular flight (or continue a flight as planned). To reach a decision, each participant in the decisionmaking process must be familiar with aircraft operations pertaining to the mission being planned.

(3) All personnel assigned to EMS should be trained in the operational aspects of each type of aircraft used. Training should include, but is not limited to, the range of each aircraft concerning the number of crewmembers and passengers carried, equipment installed, including carry-on equipment, weather capabilities, safety around aircraft, and safety in airport areas.

(4) The certificate holder should be thoroughly familiar with the operational characteristics of each aircraft, and the qualifications of each flight crewmember.

(5) Pilot judgment may be defined as: The mental process by which the pilot recognizes, analyzes, and evaluates information regarding himself/herself, the aircraft, and the external environment. Good pilot judgment can be developed as part of a flightcrew training program. Pamphlet DOT/FAA/PM-86/42, Aeronautical Decision Making for Commercial Pilots, is recommended to improve aeronautical decisionmaking. The pamphlet covers the concepts of judgment and decisionmaking and is designed to be reviewed under the supervision of a flight instructor.

(6) Decisions concerning flight operations should be made by the pilot in command (PIC) or management personnel qualified in accordance with FAR Section 135.39. This normally does not include medical personnel such as the aeromedical director or chief nurse of an EMS operation.

(7) A final decision to conduct a flight, or to continue a flight as planned, should be made by the PIC based on his/her judgment. The decision should not be based solely upon the condition of the patient.

(8) The final step is the decision to conduct the flight in a safe and timely manner.

CHAPTER 3. OPERATIONS

7. **GENERAL.** This chapter outlines recommendations regarding FAR Part 135 EMS operations with airplanes.

a. **EMS Flight Following.** In order to ensure a safe and orderly accomplishment of an EMS/A mission, each operator should develop a flight following system. The requirements for conducting flights for which no flight plan has been filed are in FAR Section 135.79. EMS/A operations should be conducted using IFR flight plans and procedures, when feasible, to achieve the highest level of safety.

(1) In addition to IFR flight plans, flightcrews should have procedures to notify the flight following center of the specific aircraft departure time and estimated time of arrival at the scheduled destination.

(2) When visual flight rule (VFR) operations are conducted, a procedure should be used to ensure that each operator can safely conduct the entire flight under VFR conditions.

(3) Each EMS operator is urged to devise a system of obtaining weather information for use prior to releasing any flight.

b. **Flight Time and Rest Requirements.** Each operator should maintain records showing compliance with the flight and rest requirements of FAR Part 135.

(1) The certificate holder's manual should include policy regarding pilots on call with the use of remote paging devices. The manual should indicate how the use of these devices impacts duty time limitations.

(2) Operators using paging devices should consult with their respective FSDO when developing their operations manual and operating procedures so they can properly describe the conditions when a paging device will be used.

c. **Weight and Balance.** Each operator should develop a control system for weight and balance that shows the aircraft will be properly loaded and will not exceed limitations during flight. A control system may include the following:

(1) A loading schedule, composed of graphs and tables based on pertinent aircraft data established for use in loading the aircraft in a rapid manner for EMS operations, should be prepared.

(2) An index type weight and balance program using average load weights established in accordance with AC 120-27, as revised. If the index system is used, the manual should contain the procedures for using, managing, and updating.

(3) These programs should include assorted aircraft occupant and equipment configurations (i.e., two pilots, two medical personnel, two patients, large carry-on equipment, balloon pumps, oscillators, 30 percent fuel, etc).

d. **Instrument Flight Rules.** ATC will provide priority handling for EMS flights using the "Lifeguard" call-sign. The AIM states that extreme discretion is necessary when using the term "Lifeguard" and that the call-sign is intended for only that portion of the flight requiring expeditious handling. EMS operators should encourage their flightcrews to use "Lifeguard" as appropriate in the remarks section of their flight plans and in radio communications with ATC. Additional considerations when planning IFR flights include the following:

(1) Avoid flight in icing whenever possible.

(2) Avoid weather conditions that may induce additional stress on the patient.

(3) Have contigency plan for coordination of ground services if weather causes diversion to an alternate airport.

CHAPTER 4. SAFETY

8. **GENERAL.** The commitment to safety must start at the top of an organization. The single most important element of a successful safety program is the commitment of senior management. Safety cannot be dictated - it must be practiced. Managers must display a prudent safety attitude by being involved in safety training. The following safety program recommendations are unique to EMS/A operations:

a. **Safety Program.** The safety program should be developed considering coordination, when necessary, with organizations that may be essential to the safe completion of an air ambulance mission. Depending on the nature of the operation, an operator may coordinate with one or more of the following organizations: ATC, hospitals, police departments, fire departments, ground ambulance services, and search and rescue organizations. An operator might hold briefing sessions with another organization prior to undertaking a specific EMS mission addressing topics concerning the aircraft operation.

b. **The certificate holder should designate a safety officer.** This individual should be familiar with each aspect of an EMS operation with emphasis on the safety requirements involved in the operation of EMS aircraft. This individual should plan, organize, and disseminate information about the safety program to all involved persons.

c. **The program should encompass at least the following areas:** Safety in and around aircraft, flight preparation, weather analysis, communication equipment and procedures, facilities, and other areas deemed appropriate by the certificate holder and local FSDO.

d. **The foundation of any safety program is training.** Supervisors and managers are ultimately responsible for the success and safety record of their organization. To achieve safety, personnel must receive quality instruction in all aspects of their jobs concerning the safest method of accomplishment. Trained personnel are able to recognize hazardous situations and take appropriate action to avoid accidents.

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