ADVISORY CIRCULAR

CAA-AC-OPS045
November 2022

PROCESS & APPLICATION: AIR AMBULANCE OPERATIONS

1.0 PURPOSE

1.0.1 This Advisory Circular (AC) is applicable to Uganda operators who intend to provide emergency medical services and operations to the public. It prescribes guidance to individuals, organizations and other entities regarding the provision of air ambulance services in a manner that is acceptable to Uganda Civil Aviation Authority (UCAA).

1.0.2 Guidance in this advisory circular is applicable to both airplanes and helicopters, except where it specifically identified as applicable to only to EMS/A or EMS/H.

1.0.3 This Advisory Circular (AC) is an Initial issue dated November 2022.

2.0 GENERAL

2.0.1 Air ambulances are a vital tool within the medical field, providing a means of transporting critically injured people in urgent need of medical assistance. Each year thousands of patients are transported while being attended by medical teams trained to accommodate specific needs of the patients.

2.0.2 There are some risks that are associated with air ambulance/EMS operations that must be mitigated through the implementation of requirements and recommendations for such operations.

3.0 REFERENCE

I. The Civil Aviation (Air Operator Certification and Administration) Regulations 2022.

4.0 DEFINITIONS & ACRONYMS

4.0.1 The following definitions are used in this advisory circular—

1) **Aeromedical Director.** A licensed physician within an air ambulance service or EMS operation who is ultimately responsible for patient care during transport missions. The aeromedical director is responsible for assuring that appropriate aircraft, medical personnel and equipment are provided for each patient.

2) **Air Ambulance Service and/or Emergency Medical Service (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.

Note: An air ambulance or EMS aircraft 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.

- The service of providing transportation to medical personnel for the purpose of harvesting body parts is considered a passenger operation.
- The service of providing transportation for body organs and no passengers can be considered a cargo operation.

3) **EMS/H:** A helicopter designated for the 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 or EMS/H is equipped with the medical equipment (portable or installed) necessary to support these levels of care in flight with trained medical personnel.

4) **Helicopter Emergency Medical Evacuation Service (HEMES).** The operation of a helicopter, based at a hospital, to transport patients in an emergency medical evacuation service only.

5) **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 AOC holder.

6) **Basic Life Support.** This 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.

(a) 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.

(b) As used in this circular, 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.

7) **Advanced Life Support** This 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.

(a) 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.

(b) The following elements are recommended for ALS—

(i).BLS capability;

(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—

- Air-to-ground communications to ensure continuity of care; and
- The capability of constant monitoring and life support until the patient has been delivered to a continuing care facility.

ACRONYMS

4.1 The following acronyms and abbreviations are used in this advisory circular—

1) **ALS** – Advanced Life Support
2) **BLS** – Basic Life Support
3) **AME** – Aircraft Maintenance Engineer
4) **AMO** – Approved Maintenance Organization
5) **AOC** – Air Operator Certificate
6) **EMI** – Electromagnetic Interference
7) **EMS** – Emergency Medical Services
8) **EMS/A** – Emergency Medical Services with Aeroplanes
9) **EMS/H** – Emergency Medical Services with Helicopters
10) **HEMES** – Helicopter Emergency Medical Services
11) **MEL** – Minimum Equipment List
12) **MMEL** – Master Minimum Equipment List (approved by State of Design (or Manufacture.
13) **RFI** – Radio Frequency Interference
14) **TSO** – Technical Service Order
15) **UCAA** – Uganda Civil Aviation Authority
16) **UCAR** – Uganda Civil Aviation Regulation

5.0 GENERAL POLICIES: AIR AMBULANCE/EMS

5.1 AIR OPERATOR CERTIFICATE IS REQUIRED

5.1.1 The operation of an aircraft in air ambulance service for the public is considered to be commercial air transport under UCAA.

5.1.2 The AOC holder must meet the requirements for—

1) Commercial air transport in the type of aircraft; and
2) Provision of air ambulance/EMS services prescribed in this circular.

Note: The only exception to the AOC requirement would be a service that is wholly owned and operated by a government agency and where there is no direct charge to the patient.

5.2 SEPARATE APPROVAL REQUIRED

5.2.1 An existing AOC holder cannot begin any air ambulance/EMS operations without the approvals identified in this advisory circular.

5.2.2 The AOC holder must demonstrate that the individual approvals identified in this AC are in place and can be used effectively by the operator's personnel.

5.2.3 An overall approval for air ambulance/EMS operations is issued by operations specification to the AOC holder on completion of the required demonstrations.

Note: An AOC applicant may complete the certification elements for EMS during their initial AOC certification.

5.3 MEDICAL CONSIDERATIONS

5.3.1 The first step leading to the assigning of an air ambulance is the decision by the medical authority, usually a physician or nurse, to move the patient by air.

5.3.2 The changes associated with flying, however, may constitute an additional hazard for some patients.

5.3.3 It is important that medical personnel are aware of the effect of the aviation environment on various conditions and make their decision based on an established set of criteria as it outlined in this AC.

5.4 CONTENTS OF AN AIR AMBULANCE/EMS APPLICATION

5.4.1 An acceptable air ambulance/EMS application will contain the following items—

1. Cover letter explaining the proposed air ambulance/EMS operations—
2. Operations manual (or revision) containing the policy/procedure applicable to air ambulance/EMS operations;
3. List of aircraft and any specialized navigation or vision-enhancing devices to be used;
4. List of EMS equipment for installation and supporting airworthiness documents;
5. Training program (or revision) for pilots containing any EMS-related qualification requirements;
6. Training program (or revision) containing for flight dispatchers containing any EMS- related qualification requirements;
7. Training program for medical personnel containing any aviation-related training applicable to the air ambulance/EMS operations;
8. Training program for other air ambulance/EMS personnel, such as medical dispatchers or coordinators, requiring aviation-related training to participate in the EMS process;
9. SMS manual (or revision) containing the EMS-related policy/procedures.

6.0 CERTIFICATION FOR AIR AMBULANCE/EMS APPROVAL

6.1 PRE-APPLICATION PHASE

6.1.1 The applicant for initial AOC certification may include the request for air ambulance/ EMS approval in the original Pre- Application Statement of Intent.

6.1.2 Existing AOC holders may simply advise UCAA via telephone or letter and request a Pre-Application Meeting.

6.1.3 UCAA will nominate a date for the Pre-Application Meeting for the applicant at a convenient time to be arranged.

6.2 FORMAL APPLICATION PHASE

6.2.1 Shortly after the formal application is submitted, the UCAA will make an initial review of the application contents to determine that it is acceptable for processing.

6.2.1.1 If the air ambulance/EMS application is acceptable, the UCAA will notify the applicant of the intent to process with evaluation of the documents.

6.2.1.2 If the air ambulance/EMS application is not acceptable, the UCAA will return all documents included in the formal application to the applicant.

6.3 DOCUMENT EVALUATION PHASE

6.3.1 In this phase, the UCAA will review in detail the documents and manuals submitted with the formal application for conformance to the applicable regulations and relevant safety practices.

6.3.2 When the documents are acceptable, the UCAA will notify the applicant of the intent to progress to the demonstration phase.

6.4 DEMONSTRATION PHASE

6.4.1 In this phase, the UCAA will perform a series of inspections, that culminate with one or more demonstration flights.

6.4.2 **RECORDS INSPECTIONS**

6.4.2.1 **Maintenance Records**

The UCAA will inspect the aircraft maintenance records at the operator's primary base to ensure that all airworthiness requirements associated with air ambulance/EMS operations have been addressed.

6.4.2.2 **Pilot Qualification Records**

The UCAA will inspect the pilot qualification records to ensure that they have completed all training and attained the necessary qualification specified for air ambulance/EMS operations.

6.4.2.3 **Pilot Flight Time & Rest System**

The UCAA will inspect the pilot member scheduling and flight time records to ensure that the applicant has implemented a system that addresses the special fatigue considerations associated with air ambulance/EMS operations.

6.4.2.4 **Other Personnel Qualification Records**

The UCAA will inspect the qualification records of other personnel specified in this AC to ensure that they have been qualified by the applicant for participation in air ambulance/EMS operations.

6.4.2.5 **AIRCRAFT CONFORMITY INSPECTIONS**

Each aircraft to be used in air ambulance will receive a UCAA conformity inspection for compliance with all applicable airworthiness requirements and documentation for air ambulance operations.

6.4.3 **ORGANIZATION, FACILITIES & EQUIPMENT INSPECTIONS**

6.4.3.1 **Maintenance Facilities**

a. The operator and/or service provider maintenance facilities may be inspected for compliance with the appropriate air ambulance/EMS requirements, including the adequacy of tools, spare parts, special tools, and that properly trained personnel are available
b. Maintenance facilities should be large enough to accommodate the largest aircraft used by the AOC holder, adequately lighted, and properly equipped for required maintenance.
c. This inspection will include the additional specialized tools/equipment required for the EMS equipment installed in the aircraft.

6.4.3.2 **Operations Facilities**

a. The primary base of operations will be the location of all documents and records associated with the air ambulance/EMS operations, unless otherwise authorized by the UCAA.
b. The operations facilities inspection will include the areas for flight planning, scheduling and flight following and rest facilities (if applicable),

6.4.3.3 **Heliport/Helideck Inspection**

a. For EMS/H heliports, other than medical emergency sites, it will be a UCAA inspector to determine that they meet the criteria established in Annex 14 for heliports.
b. The UCAA will also be on-site to inspect the implementation procedures for a simulated medical emergency landing prior to the landing of the helicopter during the demonstration flight.

6.5 DEMONSTRATIONS

6.5.1 Evacuation Demonstration

The applicant will be required to demonstrate the procedures for a ground evacuation of the personnel and the patient from the aircraft.

6.5.2 Communications Demonstration

The applicant will be required to demonstrate the communications capability of the operations center with the air ambulance aircraft during a demonstration flight scenario.

6.5.3 Demonstration Flight

The applicant will be required to conduct at least one demonstration flight scenario exhibiting the capability to support a typical air ambulance operation for which they seek approval.

6.5.4 Night Demonstration Flight - Helicopters

The applicant for EMS/H night operations will be required to conduct at least one demonstration flight to and from an unprepared landing site and a heliport.

6.5.5 FINAL CERTIFICATION ACTIONS PHASE

In this phase, the UCAA will complete all documentation necessary to the grant of air ambulance/EMS approval, including the issuance of new operation specification (OPSPECS).

7.0 AIRWORTHINESS

7.1 INSTALLATION OF EMS SPECIALIZED EQUIPMENT

a. The applicant should identify, in their initial application, any specialized equipment that may be used in air ambulance/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 UCAA).
   - UCAA may approve add-on equipment installation after evidence of airborne test results are submitted from the aircraft operator or a recognized independent testing organization.

b. Any equipment installed aboard the aircraft should comply with the applicable data for such installations and be able to withstand the following static loads —
   1) 9.0 G forward;
   2) 6.6 G downward;
   3) 3.0 G upward,
   4) 1.5 G sideward; and
   5) For tie-downs: 13.5 G forward, 9.9 G downward, 4.5 G upward, 2.25 G sideward.

7.2 INSTALLATION REQUIREMENTS

7.2.1 SUPPLEMENTAL TYPE CERTIFICATE (STC) OR FIELD APPROVAL

a. All items of additional equipment must be installed in accordance with the applicable UCAR.

b. The installation of additional equipment may require a STC or field approval by the UCAA.

c. Normally the STC should provide instructions and operational supplements, weight and balance data, and instructions for continued airworthiness.

d. The requirements for field approval are the same as for a STC. If the applicant is unsure of the requirements on the proposed equipment, they should contact the UCAA before installation is initiated.

7.2.2 WHO MAY INSTALL THE EMS EQUIPMENT?

a. Each installation must be evaluated by the UCAA at the time of its approval to determine —

1) If a licensed AME is required to perform installation; or
2) If other personnel can be trained for removal and replacement of these items.

b. 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 AOC holder may be authorized to install the equipment.

7.2.3 MAINTENANCE FLIGHT TEST REQUIRED

a. The applicant should ensure that the installation of all additional equipment is compatible with all previously installed aircraft systems.

- Medical monitors may also be affected by the aircraft's electronic equipment.
- Medical monitors should be checked for accuracy by medical personnel before use with a patient.
- Aircraft should be flight-tested with all EMS equipment electrical motors running to check for RFI/EMI.
- Aircraft navigation and communication equipment may have to be recalibrated after installation of any additional medical equipment.

b. 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

7.2.4 EMS-RELATED EQUIPMENT

In addition to the instruments and equipment required for AOC operations, the following equipment should be expected for air ambulance/EMS operations. Installed EMS-related equipment should be included in the MEL where the MMEL includes the provisions for such equipment.

7.2.5 RADIOS CAPABLE OF AIR-TO-GROUND COMMUNICATIONS

Reliable air-ground communications by radio or data-link will be necessary to ensure a safe and satisfactory completion of transportation and to coordinate with ground transportation service when necessary for the patient.

7.2.6 MEDICAL OXYGEN SYSTEM

a. 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 guidance published by the State of Design (or Manufacture) the system may be serviced by any person trained by the AOC holder.

b. 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 AOC 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 licensed aircraft maintenance engineer or an AMO.

c. An incubator may feature a self-contained oxygen supply capable of delivering a controllable flow rate. An adequate supply of oxygen normally will be provided by the medical authorities. If extra oxygen cylinders are to be carried, they shall have protective containers and be capable of being appropriately restrained in a manner acceptable to UCAA. The aircraft oxygen system shall not be used for incubators.

7.2.7 SUPPLEMENTAL LIGHTING SYSTEMS

a. Some aircraft may require additional interior lighting since standard aircraft lighting may not be sufficient for adequate patient care. A means to shield the cockpit from light in the patient area should be provided for night operations

b. 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.

7.2.8 EMS ELECTRICAL POWER

a. All wiring, electrical components and installation procedures must conform to the requirements of airworthiness code used for validation of the Type Certificate and the manufacturers maintenance practices.

b. 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.

c. If an incubator is to be used that includes features requiring electrical power, the applicant should ensure, during the maintenance flight test, that there is no interference with the instruments and equipment that are required for safe operation of the aircraft.

7.2.9 MOTOR-DRIVEN VACUUM & AIR PUMPS

a. This equipment must be installed in accordance with the applicable airworthiness code.

b. 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.

7.3 RESTRAINTS FOR ITEMS OF MASS

7.3.1 General

a. Incubators. balloon pumps, or other large carry-on medical equipment must be restrained in an appropriate manner to the following ultimate load factors:
   - 3.0G upward, 6.6G downward; and
   - 9.0G forward, 1.5G sideward.

b. Aircraft cargo straps or safety belts provide a satisfactory restraint in many instances. Also, mechanical (metallic) fasteners may be used for attachment.

c. The applicant must use an approved retraining device; unless Manufacturer pull test data is provided to verify that specific equipment can withstand the specified loads.

7.3.2 CARRIAGE OF INCUBATORS & STRETCHERS

Restraint devices should conform to the airworthiness code used for validation of the Type Certificate and the manufacturers maintenance installation practices for restraint devices.

7.3.3 Stretcher or Incubator Installation

a. The stretcher or incubator installation—
   1) Shall not interfere with any operation of a. any aircraft controls;
   2) Shall not restrict access to, or the use of, regular exits;
   3) Shall not obstruct any emergency exit, or the aisle(s) leading to an emergency exit;
   4) Shall not restrict access to emergency equipment; and
   5) Should be so arranged as to allow ready access by accompanying medical personnel to perform monitoring and therapy functions when needed.

b. 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.

c. The operator should provide padding for the infant for forward and downward loads and movement. Mattresses and all padding used should be con- form to the applicable TSO.

d. The attachment of the stretcher or incubator to the aircraft structure shall allow its rapid detachment for evacuation.

e. All stretcher and incubator restraint systems require UCAA (Airworthiness) approval.

7.4 OTHER RESTRAINTS

7.4.1 Patient Restraint

a. The patient restraint shall be designed to prevent unwanted movements of the person using it during turbulence or in an emergency landing, and to apply the restraining loads over a large area of the body.

b. Restraining devices, including shoulder harnesses, must be available to ensure patient safety.

c. Each patient restraint system shall have a quick-release means to allow its rapid detachment in an evacuation.

d. Some patients may be so injured that the restraint system used will be based on a medical opinion.

e. All patient restraint systems require UCAA (Airworthiness) approval.

f. Where an emergency situation involves a patient who is unable to be restrained on a stretcher prior to being stabilized, the sole purpose of the flight must be medical evacuation.

7.4.2 **Child Restraint**

Infant seats provided must meet the applicable requirements for such restraint and securing criteria.

7.4.3 **INTERCOM SYSTEM**

a. An intercom system should be provided for pilots and medical personnel to communicate with each other during flight.

b. 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 pilots regarding a patient's medical condition.

7.4.4 EQUIPMENT FOR PATIENT CARE ONLY

a. Many times in an aircraft, 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.

b. The racks should be removed and replaced by a licensed AME or AMO.

c. Medical equipment in the racks used for patient care should be installed so that it may be removed readily to accompany the patient.

- The AOC holder must ensure that the installation of all additional equipment is compatible with the aircraft systems.
- 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)
- Equipment installed aboard the aircraft should meet the static and dynamic loads specified for such installations.

d. All medical equipment shall be appropriately restrained in a manner acceptable to UCAA.

e. Instructions for removal and replacement should be contained in the operator's operations manual.

8.0 OPERATIONAL REQUIREMENTS

8.1 OPERATIONS MANUAL

8.1.1 The operations manual must be adapted to include policy/procedures related to air ambulance/EMS operations. The appropriate portions of the manual must be available in each aircraft and at each flight operations location.

8.1.2 The following air ambulance/EMS-related guidance should be included in that manual as applicable for aircraft type—

1) Names of the air ambulance/EMS management personnel that have authority to act for the AOC holder;
2) Communications procedures for the air ambulance flight watch; (if applicable)
3) Special ground handling requirements;
4) Approved method of restraining a stretcher or incubator, patient and any medical equipment transported;
5) Stretcher or Incubator installation;
6) Patient orientation relative to the aircraft axis;
7) Operational procedures as applicable to each type of aircraft;
8) Medical attendant's duties and responsibilities;
9) Procedures for required coordination between medical personnel and pilots.
10) Assignment of person responsible to restraint stretcher or incubator, patient and any required medical equipment in the aircraft;
11) Assignment of a pilot to assist passengers in the cabin in the event of an emergency evacuation or in-flight incident involving fire or smoke in the cabin, or any incident threatening the safety of the aircraft or its occupant if a cabin attendant is not carried;
12) Assignment of a crew member to ensure the safety of passengers and others approaching and department a helicopter when the rotors are turning;
13) Refueling procedures for normal and emergency situations while patients are in the aircraft.
14) Procedures to ensure the following are conducted prior to flight;
    (a) Pre-flight briefing to include information on seat belts, emergency exits, main door operation, life-jackets, passenger safety card location, and use of cabin light switches;
    (b) A visual check to ensure adequacy of stretcher or incubator installation and restraint, as well as patient restraint;
    (c) A visual check to ensure any required medical equipment is adequately restrained;
    (d) Procedures respecting completion of pre-takeoff and pre-landing cabin checks by a crew member;
    (e) Procedures respecting the stowage of carry-on baggage, equipment and cargo;
    (f) If it is determined that the incubator or stretcher will not fit through any one exit, such information shall be contained in the Operations Manual and shall be included in the pre- flight briefing.
15) Evacuation procedures should be established for—
    (a) The evacuation of patient removed from stretcher;
    (b) The evacuation of patient whose injuries prevent his/her release from stretcher.
    (c) Criteria shall be established for each aircraft type to determine if a patient and stretcher can easily be evacuated from each exit on that aircraft; and
    (d) Evacuation of incubator.

8.2 EMS FLIGHT FOLLOWING

8.2.1 In order to ensure a safe and orderly accomplishment of an EMS mission, each operator should develop a flight following system.

8.2.2 Air ambulance/EMS operations should be conducted using IFR flight plans and procedures, when feasible, to achieve the highest level of safety.

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

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

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

8.3 PILOT FLIGHT TIME & REST REQUIREMENTS

Each AOC holder is required maintain records showing compliance with the flight and rest requirements of the UCARs.

8.3.1 PAGING DEVICES

a. The AOC holder's operations manual should include policy regarding pilots on call with the use of remote paging/texting devices.

b. The manual should indicate how the use of these devices impacts duty time limitations.

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

8.3.2 CREW REST FACILITIES

a. Where pilots assigned EMS/H duty are on standby for expedited departures, an adequate place of rest will be provided at or in close proximity to the hospital at which the HEMES assignment is being performed.

b. The place of rest should be in an area away from the general flow of vehicle and pedestrian traffic allowing a quiet, restful atmosphere.

c. The place of rest should provide adequate facilities including but not limited to, a shower, a closet, a bed with sheets, and the space environmentally controlled for comfort. The place of rest should be available on a continuous basis for pilot members.

8.4 WEIGHT & BALANCE

8.4.1 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.

8.4.2 A control system may include the following—

- 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 air ambulance/EMS operations, should be prepared.

- An index type weight and balance program using average load weights. If the index system is used, the manual should contain the procedures for using, managing, and updating.
- 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).

8.5 INSTRUMENT FLIGHT RULES

8.5.1 Considerations when planning IFR flights include the following—

- Avoid flight in icing whenever possible.
- Avoid weather conditions that may induce additional stress on the patient.
- Have contingency plan for coordination of ground services at the alternate airport, if weather causes a diversion.

8.5.2 Within Uganda, ATC will provide priority handling for air ambulance/EMS flights using the "Lifeguard" call-sign. EMS operators should encourage their pilots to use "Lifeguard" as appropriate in the remarks section of their flight plans and in radio communications with ATC. This call-sign is intended for only that portion of the flight requiring expeditious handling.

8.6 HELICOPTER OPERATIONAL CONSIDERATIONS

8.6.1 Helicopter air ambulance operations conducted between airports or certified heliports are essentially no different from aeroplane operations.

8.6.2 Operations from unprepared sites, however, do require special consideration. The ambulance services may wish to be prepared for such an eventuality in the event of an emergency.

8.6.3 Operations from such sites, particularly at night, require careful planning and a number of factors should be considered, some of which are outlined below—

- A moveable search light capable of operation without the pilot having to remove his hands from the controls;
- Use of enhanced vision system (night vision goggles);
- Air to ground communications with persons on the landing site;
- Restraining devices for preventing patients from interfering with the flight controls (patients are less likely to be stabilized prior to transfer);
- An intercommunications system between pilots and medical personnel
- A wire strike protection system;
- Weather minima;
- Landing site evaluation procedures;
- Training of personnel in loading and unloading the helicopter with rotors turning; and
- Training of at-the-scene ground personnel (involves police, ambulance attendants etc. in landing site selection and marking; weather estimation, hazards to landing, loading, etc.).

8.7 TRANSPORTATION OF DANGEROUS GOODS

8.7.1 Air ambulances are subject to The Civil Aviation (Safe Transportation of Dangerous Goods by Air) Regulations, 2022

8.7.2 When an air ambulance transports dangerous goods without a patient the full requirements of the Act and Regulations apply—

- When an air ambulance transports dangerous goods to provide, during flight, medical aid to a patient certain exemption from the Act and Regulations apply.
- When a patient brings a medical article for personal use, including articles containing oxygen, on board as carry-on baggage that article is exempt from the Act and Regulations,
- Where compressed oxygen or air cylinders are integral to the aircraft configuration such installations shall be approved by the UCAA.
- Refer to Section 1;1.1.2 of the International Civil Aviation Organization Technical Instructions.

8.8 ORIENTATION OF PASSENGERS

8.8.1 PATIENT ORIENTATION

a. The preferred orientation is the patient's head towards the front of the aircraft so that most of the forward loads applied by the patient restraint system are applied on the shoulder area.

b. In an aeroplane, the patient should be placed fore and aft along the longitudinal axis.

c. This is the preferred orientation for helicopters, as well; however, due to the different structural configuration and possible crash scenarios, this may not be feasible if warranted.

8.9 MEDICAL ATTENDANT

8.9.1 While not specifically required by regulation, all patients, particularly those confined to a stretcher or babies in incubators, should be accompanied by a medical attendant.

8.9.2 Attendants should be assigned a seat which is convenient to their patient.

8.10 MEDICAL ATTENDANTS

a. There are no UCAR requirements specifying the conditions under which a medical attendant must be carried. UCAA also has no jurisdiction over the qualifications or training of medical attendants. The AOC holder should establish standards for medical personnel and clearly define the criteria for their employment.

b. UCAA recommends that all air ambulance flights carry a medical attendant and/or cabin crew member. A medical attendant should be an able bodied person physically capable of assisting the patient to an exit in the event of an emergency and who will attend to the personal needs of the patient in flight.

c. Medical attendants are NOT normally crew members and have NO in-flight crew assignments. There should be no confusion regarding the status of medical attendants and their responsibilities relating to the operation of the aircraft.

d. Medical attendants must still complete a minimum program of EMS training program determined by the AOC holder.

e. Medical attendants may be designated as crew members if they receive approved cabin crew member training and qualification.
f. As qualified cabin crew members, they may be assigned duties such as passenger briefing, evacuation, and look-out for helicopter landings.

9.0 PERSONNEL QUALIFICATION & TRAINING

9.1 PILOTS

9.1.1 BASELINE AOC QUALIFICATION

a. All pilot qualifications are established by UCAA and are based on aircraft type.
b. Pilots employed by AOC holders are also required to undergo specified training on a periodic basis as directed by the UCARs.

9.2 HIGH STRESS ENVIRONMENT

9.2.1 Although most air ambulance flights are routine transfers of stabilized patients to higher care facilities, some are urgent missions with life or death consequences often conducted at night or in marginal weather. These types of operations place a great deal of stress on pilots, who require mature judgment to avoid allowing their sense of mission accomplishment to override this reason.

9.2.2 Agencies contracting for air ambulance services may wish to specify requirements over and above the minimum required by regulation such as—

- Two pilots on all flights;
- Additional training and experience; and
- The requirement for the air operator to maintain an approved list of those pilots authorized to fly aircraft supplied under the contract.

9.3 MORE RESTRICTIVE RECENCY OF EXPERIENCE REQUIREMENTS

9.3.1 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.

9.3.2 Pilots should undergo regular recurrent training to ensure they will be familiar with all instrument flight procedures authorized on the operator's operations specifications.

9.3.3 Since medical flights may use airports with no air traffic control (ATC) assistance, no-radar environment and limited facilities, pilots must be proficient in non-precision approach procedures.

9.4 SPECIALIZED EMERGENCY CONSIDERATIONS

9.4.1 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.

9.4.2 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.

9.5 DISPATCHERS & COORDINATORS

9.5.1 The persons assigned to operational control for the AOC complete a specific baseline training and qualification program for AOC operations. Depending on their size, an AOC holder usually employ a formalized system which encompasses tasking, priorities, communications, operational control, etc.

9.5.2 One of the keys to the effectiveness of these systems is the interaction of the air ambulance coordinator with the person assigned operational control for the AOC holder. It is usually best that these positions are combined.

9.5.3 Often, however, air ambulance dispatchers are part of the land ambulance system and may not be knowledgeable about the aviation aspects of the service. Compounding this problem, many air ambulance flights are self-dispatched, particularly those of an urgent nature, thus the additional assistance that a pilot might receive from the AOC operational control system may not be available. It is imperative that the decision making process leading to the dispatch of an EMS flight be clearly defined and understood by all involved.

9.5.4 To this end, air ambulance dispatchers/coordinator should receive training and understanding in the following—

1) Weather reporting system;
2) Weather limits for applicable aircraft types;
3) Aircraft performance and capabilities;
4) Applicable UCAR requirements; and
5) AOC holder tasking procedures.

9.6 MEDICAL PERSONNEL

9.6.1 Training in the aviation environment is desirable for medical personnel involved in air ambulance operations. The training program should consider the particular aircraft used, equipment and safety features.

9.6.2 Depending on whether the attendant is part of a dedicated service or accompanies patients on an occasional basis this training will likely carry in length, but should at least include familiarity with the following—

1) Pertinent aviation terminology to avoid confusion or misunderstanding of instructions from the pilots;
2) Proper use, removal, and replacement of medical equipment installed on the aircraft.
3) Physiological aspects of flight prior to being assigned duty during flight.
   (a) Hypoxia;
   (b) Hyperventilation;
   (c) Effects of scuba diving;
   (d) Effects of smoking and drugs;
   (e) Hypothermia;
4) Patient loading, unloading and restraint;
5) Medical equipment restraint;
6) Meteorological weather conditions;
7) G forces: positive and negative;
8) Principles of protection against G force in an emergency landing or ditching;
9) Turbulence problems with patient seat belt and traction devices;

10) Effects of noise and vibration on the ill or injured;
11) Difficulties encountered using "common" medical equipment in an aircraft environment;
12) Aircraft evacuation, including a stimulated evacuation with patient on stretcher;
13) Helicopter-specific enplaning and deplaning procedures;

9.7 GROUND HANDLING

9.7.1 Air ambulance/EMS operations require stringent safety precautions around the aircraft especially during loading and unloading.

9.7.2 The UCAA recommends that each AOC holder develop a training program that encompasses, in addition to their normal training program, ground handling and loading.

9.7.3 FOR ALL AIRCRAFT

9.7.3.1 All persons involved in ground handling and loading should receive—

1) Personal safety in and around the aircraft for all ground personnel, including UCAR requirements and safety measures for each aircraft used.
2) Loading and unloading the aircraft.
3) Use of visual cues for positioning and parking the aircraft (i.e., standard hand signals, communications, etc.).
4) Medical personnel should be familiar with procedures to direct ambulances and ground equipment to the aircraft.
5) 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.
6) 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. UCAA recommends that this program involve a licensed AME to teach the correct procedures for handling oxygen equipment.

9.7.4 FOR HELICOPTERS

The safety risks associated with enplaning and deplaning from a helicopter warrant special training considerations, including—

1) Loading and unloading the helicopter with the rotors and/or engine running.
2) Loading and unloading with the helicopter shut down.

9.7.5 MAINTENANCE PERSONNEL

9.7.5.1 In addition to meeting the requirements of the UCARs, maintenance personnel should be trained—

1) By the manufacturers of the aircraft modification equipment, or
2) In other maintenance training programs approved by the UCAA.

9.7.5.2 Inspection of installations, as well as removal and reinstallation of special medical equipment, should be a part of this training

9.7.5.3 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.

10.0 SAFETY

10.1 SAFETY MANAGEMENT

a. UCAA encourages all AOC holders to establish a company aviation safety management program. This program involves a commitment to safety from all company personnel, from the Accountable Manager down to the newest apprentice. The key to its success is the Head of Safety, who is the coordinator of the program and is responsible for its implementation.

b. A successful company safety management program can have a positive effect on many aspects of air ambulance operations and one of the most important is pilot judgment. The UCAA recommends that all air ambulance operators have in place a viable Aviation Safety Management Program.

10.2 SAFETY PROGRAM

10.2.1 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.

10.2.2 An operator might hold briefing sessions with another organization prior to undertaking a specific EMS mission addressing topics concerning the aircraft operation.

10.2.3 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.

10.2.4 The AOC holder should designate a safety officer. This individual should be familiar with each aspect of an air ambulance/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.

10.2.5 The program should encompass at least the following areas—

- Safety in and around aircraft;
- Flight preparation;
- Weather analysis;
- Communication equipment and procedures;
- Facilities.

10.2.6 The foundation of any safety program is training. Supervisors and managers are ultimately responsible for the success and safety record of their organization.

10.2.7 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.

10.3 JUDGMENT & DECISIONS

10.3.1 The decision making process should have input from all elements involved in an EMS operation. Aeromedical directors, aircraft operators, the pilots, 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.

10.3.2 Management personnel, including the aeromedical director, should be familiar with appropriate UCAR guidelines related to safe operations. Management personnel should participate in the AOC holder's training program to gain knowledge concerning EMS operations.

10.3.3 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 decision making process must be familiar with aircraft operations pertaining to the mission being planned.

10.3.4 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 crew members and passengers carried, equipment installed, including carry-on equipment, weather capabilities, safety around aircraft, and safety in airport areas.