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GOVERNMENT OF INDIA

OFFICE OF THE DIRECTORATE GENERAL OF CIVIL AVIATION

OPP. SAFDARJUNG AIRPORT, NEW DELHI - 110 003

**CIVIL AVIATION REQUIREMENT
SECTION 8 – AIRCRAFT OPERATIONS
SERIES S PART VII**

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F. No 22024/22/CAR(H)2015-FSD

Subject: OPERATION OF AEROMEDICAL TRANSPORTATION (AMT)

1. INTRODUCTION

1.1 Aeromedical transportation (AMT) is the movement of patients, organs, blood, tissue, medical supplies, or medical personnel by aeroplane or helicopter. AMT is undertaken in instances when delays in treatment are considered unacceptable or when terrestrial methods of transportation are not practicable. AMT depending upon the underlying purpose of usage can have attribute of emergency response when the underlying purpose is to render immediate medical care to prevent loss of life or aggravation of physical or psychological illness or injury. Or it can have attribute of routine ambulance transport in instances when surface means of transportation are non-existent, not practical or speedier transference is desired.

1.2 The differences in the attributes of AMT can be understood by the type of patients transported in AMT which can be stable, stabilized or unstable. Stable patients require minimal treatment in flight but will often require careful observation because the demands of the flight environment may impose physiological stresses which may cause their condition to deteriorate. Stabilized patients would have received initial treatment but are intended to be moved for urgent treatment elsewhere. They require careful observation and treatment in flight but would usually have a stabilized airway, or haemorrhage if any will be controlled, fluid replacement may be in progress, and any fractures would be stabilized. They will have a higher risk of medical

decompensation than patients who are stable. Unstable patients are moved by air only when they cannot be treated before flight. They require a full medical team with resuscitation and airway-management skills. They usually have a life-threatening condition and the purpose of the AMT is to bring them as quickly as possible to a well-equipped treatment facility.

1.3 AMT can utilise fixed and rotary wing aircraft in diverse ways depending upon the nature of the medical requirement. The AMT could be relatively undemanding in case of repatriation transfer of a healthy post-operative patient to his overseas home by an aeroplane air ambulance, as compared to the bustling activity for a critically injured person who is airlifted, unconscious and bleeding from the scene of a motor vehicle accident by an Emergency Medical Services (EMS) helicopter. Outside of the military and the emergency medical services, few operators worldwide maintain aircraft explicitly for aeromedical use, relying rather on the adaptation of existing types as and when the operational requirement arises. Accordingly, aircraft with interchangeable roles that can be readily adapted for medical transportation are sufficient for Air Ambulance (AA) operations. AA is an on-demand service that occurs in a controlled environment typically providing enough time for appropriate preparation and planning.

1.4 In contrast, EMS activity demands urgency and occurs at a very short notice requiring such a service to be always on standby. Helicopters in EMS role such as HEMS (Helicopter Emergency Medical Service) are equipped solely for the purpose of medical support and intervention confining it to AMT tasks only. Usage of aeroplanes in EMS role is non-existent because of their inability to land at the incident site for primary response but aeroplanes with customized medical equipment solely for AMT do exist as a niche AA operator.

2. APPLICABILITY

2.1 Rule 134A of the Aircraft Rules, 1937 specifies that no person shall operate any non-scheduled air transport service from, to, in, or across India except with the permission of the Central Government. This Civil Aviation Requirement contains minimum requirements for the operation of Aeromedical Transportation (AMT). This CAR is issued under the provisions contained in Rule 133A of the Aircraft Rules, 1937.

2.2 The provisions of this CAR shall be applicable to all Aeromedical Transportation (AMT) operations that include Air Ambulance (AA) flights operated by aeroplanes and helicopters, and Helicopter EMS (HEMS) operations.

3. DEFINITIONS

3.1 For the purpose of this CAR, the following definitions shall apply:-

3.1.1 'Aeromedical transportation (AMT)' means the movement of patients, organs, blood, tissue, medical supplies, or medical personnel by

aeroplane or helicopter.

3.1.2 'AMT payload' means to include patients, organs, blood, tissue, medical supplies, or medical personnel carried in an AMT flight.

3.1.3 'Air ambulance (AA)' means on-demand non-scheduled flight by an aircraft for the specific carriage of AMT payload with in-flight medical supervision.

3.1.4 'Emergency medical services (EMS)' means the services rendered by providers in response to an individual's need for immediate medical care to prevent loss of life or aggravation of physical or psychological illness or injury. It is an integrated system of personnel, equipment, communication and services to provide emergency medical treatment.

3.1.5 'Handoff' means the process of transferring primary authority and responsibility for providing clinical care to a patient from one departing caregiver to one oncoming caregiver. The primary objective of a hand off is to provide accurate information about a patient's care, treatment, and services, current condition and any recent or anticipated changes.

3.1.6 'HEMS operation' means operation by a helicopter operating under a HEMS approval, the purpose of which is to facilitate emergency medical assistance where immediate and rapid transportation is essential.

3.1.7 'HEMS Technical Crewmember' means a qualified technical crew member who has received HEMS operational training and is assigned to duties in the helicopter or on the ground for the purpose of assisting the pilot during HEMS or HHO operations, which may require the operation of specialised on-board equipment.

3.1.8 'Interfacility transfer (IFT)' means any transfer, after initial assessment and stabilization, from and to a health care facility.

Examples would include hospital to hospital, clinic to hospital, hospital to rehabilitation, and hospital to long-term care.

3.1.9 'Medical control' means the entire system of quality assurance and medical accountability for basic and advanced emergency medical treatment. Pre-hospital medical control shall include direction and advice given to emergency medical personnel by a doctor or a person acting under his direct supervision.

3.1.10 'Medical direction' means guidance or supervision provided by a doctor for AA or HEMS which includes authority over and responsibility for, emergency medical dispatch, direct patient care, transport of patients, arrangements for medical control and all other aspects of patient care delivered by the AMT provider.

3.1.11 'Patient' means any individual that meets at least one of the following criteria of,

- (a) person who has a complaint or mechanism suggestive of potential illness or injury; or
- (b) person who has obvious evidence of illness or injury; or
- (c) person identified by an informed 2nd or 3rd party caller as requiring evaluation for potential illness or injury.

3.1.12 'Protocol' means a predetermined, written medical care plan and includes standing orders specifying the conditions under which some form of emergency medical treatment is to be given by personnel certified under these rules.

3.1.13 'Referring entity' means any entity such as a medical institution, an agency providing emergency medical services, or a first responder that makes a request for aeromedical transportation to a provider of AA services or HEMS.

3.1.14 'Transfer' means the prearranged movement of a patient by AA or HEMS from one receiving facility to another receiving facility.

4. GENERAL CONSIDERATIONS FOR AMT

4.1 AMT should offer a clear advantage to the patient since this is a major value judgment and should be made only after a thorough assessment of the medical benefits for the patient. This will often be obvious when sophisticated

medical care is required urgently but sometimes the speed advantage of AMT has to be weighed against the benefits of maintaining medical care on the ground and the potential complications during transportation.

4.2 The type of aircraft and the composition of the medical team should be determined by the clinical condition of the patient and the distance to be moved. Careful medical direction and medical control for planning and preparation shall be exercised during AMT and contraindications to AMT should be anticipated.

4.3 Patients should be reassessed regularly throughout the AMT since there are specific risks inherent in aeromedical flight which interact with medical status. These are related to physical properties of flight and associated factors which include reduced atmospheric pressure, decreased oxygen tension, dehydration, motion sickness, vibration, noise and inactivity.

4.4 Guidance material for classification of patients is placed at Appendix 1 in order to provide medical and AA crew a simple and standardized means of assessing the degree of urgency, the level of medical care required, and the space requirements for AMT.

5. CLASSIFICATION OF AMT TRANSFERS

5.1 AMT transfers are commonly classified according to the response activity depending upon the degree of stabilisation of the patient. The three types of AMT transfers explain how different AMT responses work and are as follows:-

(a) Primary Response.

Primary response involves recovery of patient from the location of their injury or illness, and in almost all cases is undertaken by EMS helicopter. The helicopter is primarily dispatched to the scene of accident/incident (hence, often called a 'scene flight') and may be the only unit responding to the emergency or at least, it may be the first to arrive. Such a mission will typically involve response by HEMS to the scene of an accident/incident whereupon the treatment of the patient commences immediately and continues while the patient is rapidly transported to the nearest appropriate hospital.

(b) Secondary Response.

Secondary response is an indirect action that requires rendezvous with GEMS (Ground EMS) ambulance to facilitate rapid on-carriage of a critical patient to a higher or more appropriate level of medical care. In

this case of response some degree of stabilization is performed initially by GEMS and the AA or HEMS is employed to reduce the overall transfer time to a definitive care in cases of time-sensitive patients. Primary and secondary responses are categorised as pre-hospital care and require the aircraft to suitably equipped with life-support equipment to treat a vulnerably stabilised patient.

(c) Tertiary Response.

Tertiary response is a planned urgent transfer of patients, or medical supplies including blood and tissue requiring specialised care, or of medical personnel between hospitals. In such cases transfer journeys deemed clinically excessive by road are performed by aircraft. The transport is planned and the medical crew and equipment is tailored to the specific needs of the patient to be transported. The aircraft is used in an AA role and the transfer is usually initiated by the dispatching hospital in consultation with the specialist receiving hospital in accordance with appropriate clinical protocols. This type of transfer is called inter-facility transfer and tertiary response also includes repatriation transfer of patient to his home country.

6. AIR AMBULANCE OPERATIONAL REQUIREMENTS

6.1 Operators desirous of conducting AA operations shall obtain acceptance from DGCA prior to conduct of such a service which shall be operated under provisions for commercial air transport operations.

6.2 Aspects of AA operations shall be described in the Operations Manual and must contain specific policies and related procedures on the following:-

- (a) medical control procedures.
- (b) patient loading and unloading procedures.
- (c) protocols for patient handoff.
- (d) procedures for handling and securing of medical equipment.
- (e) patient safety and use of harness and restraining devices.
- (f) Infection and Biohazard Control policy.
- (g) refuelling procedures with medical personnel and/or patient on board.

- (h) initial and recurrent training programme for medical personnel.
- (i) physiological factors affecting well-being of patient during AMT.
- (j) procedures for handling of portable electrical sources.
- (k) evacuation procedures.

6.3 Helicopters in AA role shall:-

- (a) not operate in primary response.
- (b) in case of secondary response be limited to patients categorised as dependency classification 3 or 4 as per Patient Classification Table at Appendix I.
- (c) operate from airport and designated helipads and may extend operations to temporary helicopter landing areas subject to meeting extant requirements.
- (d) not embark/disembark AMT payload using hoist operation.

6.4 A table depicting differences in helicopter AMT roles and requirements is placed at Appendix III for clarity and easy understanding.

7. AIR AMBULANCE AIRCRAFT REQUIREMENTS

7.1 Single engine aircraft may be used for AA role and an aircraft employed for AA shall:-

- (a) be designed and maintained in a safe and sanitary condition.
- (b) be designed to accommodate at least one stretcher.
- (c) have sufficient space for storage of medical equipment and medical supplies which may be locked against unauthorized entry.
- (d) have an access large enough to allow a stretcher to be loaded without rotating it more than 30° degrees about the longitudinal axis or 30° degrees about the lateral axis.
- (e) have demonstrable unobstructed vertical space at the head and thorax areas of the upper surface of stretcher to allow for administration of life care support.
- (f) have climate control in the cabin of the aircraft to prevent extremes of temperature and humidity that would adversely affect the

care of a patient or medical supplies. Such a requirement may be waived off in case of medical personnel transfer.

(g) have an electrical system capable of servicing the power needs of all equipment for patient care carried on board the aircraft. The electricity may be supplied by the electrical system of the aircraft or by a portable source carried in the aircraft. Any modification to the electrical system on the aircraft must be approved by the DGCA.

(h) have adequate interior lighting so that the patient care can be administered and his status monitored without interfering with the vision of the pilot.

(i) have adequate tie-down fixtures within the aircraft for securing any additional medical equipment as necessary.

(j) have a communication system between the pilot and medical personnel to enable exchange of information within the crew.

7.2 AMT of a patient in a non-pressurised aircraft may be undertaken after ensuring that the flight shall have adequate supply of oxygen on board for the complete duration of the flight and that the referring entity comprehends the risks of patient transport in a non-pressurised aircraft.

8. AIR AMBULANCE MEDICAL REQUIREMENTS

8.1 All AMT flights shall be accompanied by qualified medical personnel as prescribed by the appropriate medical authority. The medical personnel may include a doctor, nurse, paramedic or emergency medical technician. Such a person shall have completed the initial and recurrent training programme for medical personnel which shall be submitted for acceptance by the DGCA. The qualified medical personnel shall be thoroughly familiar with the usage of medical equipment and have the knowledge and skills to deal with both the predictable and the unexpected. He should be well aware of the precautions to be observed during emergency landing or ditching, medical stressors in flight, patient evacuation and the inherent risks of AMT that can interact with the medical status of the patient.

8.2 Prior to undertaking any AA flight, a Medical Manifest which is a record of such a flight shall be prepared as per the format placed at Appendix II. This shall be signed both by an authorised representative of the referring entity and the Captain of the aircraft. The record of the Medical Manifest shall be maintained for a period of minimum 12 months.

- 8.3 Any stretcher when used in the AA shall:-
- (a) be positioned in the aircraft so as to allow the medical personnel a clear view and access to any part of the patient's body that may require attention.
 - (b) have a rigid surface suitable for performing cardiac compressions.
 - (c) be constructed of material that may be cleaned and disinfected after each use with a mattress or pad that is impervious to liquids.
 - (d) be capable of elevating the head of the patient up to a 45° degree angle from the base.
 - (e) have harness/belts for child and adult patient in order to provide adequate restraint.
- 8.4 Onboard medical equipment when fitted in the aircraft shall be positioned in a manner such that it:-
- (a) allows medical personnel a clear view of and access to the patient to perform monitoring and therapeutic intervention as needed.
 - (b) permits access to normal and emergency exits.
 - (c) permits access to emergency equipment.
 - (d) does not interfere or is likely to interfere with the operation of aircraft controls.
 - (e) is appropriately secured to avoid potential injury to occupants.
- 8.5 Onboard medical equipment shall:-
- (a) be secured and restrained to sustain inertia forces experienced during aborted take-off and emergency landings in conformity to FAR 25.561 and FAR 25.785 standards or as appropriate for aircraft size and type (FAR 23,25 for aeroplanes and FAR 27,29 for helicopters).
 - (b) in case of oxygen bottles be in conformity to FAR 25.1443, 25.1447 and 25.1453.
 - (c) in case utilising lithium-ion battery be in conformity to DO-311 MOPS for Rechargeable Lithium Battery Systems.

- (d) in case of infusion devices be automated and designed to be independent of gravitational flow.
- (e) if carrying dangerous goods be governed by the provisions of Aircraft (Carriage of Dangerous Goods) Rules, 2003.

9. HELICOPTER EMERGENCY MEDICAL SERVICES (HEMS) REQUIREMENTS

9.1 HEMS is a high-risk AMT operation of specialised trauma care delivery utilising a helicopter with on-board medical intervention technology and medical expertise. Operating within the realm of EMS structure it is not merely an AMT system but a trauma response entity that can stabilize and treat critical patients by intervention procedures.

9.2 Primary response retrievals from the scene of accident/incident shall be undertaken by HEMS whereby it may be the first to arrive. This often means that there has been minimal and sometimes no medical care prior to the arrival of the helicopter leading the crew to face special challenges in both aviation and clinical terms. The former, because of the dangers associated with landing in uncontrolled and unprepared landing zones, and the latter because of the undiagnosed and untreated major emergencies that they face. HEMS therefore bears greater risks than other forms of commercial air operations, and the worldwide high accident rates in HEMS corroborates this risk perception. Accordingly, risk-mitigation measures in the form of higher levels of aircraft equipage, crew standards and operational control must be incorporated to de-risk HEMS.

9.3 Operators seeking to undertake HEMS shall comply with the Ops Specs for HEMS as given in OC 02/2016 and obtain specific approval for HEMS prior to conduct of any such operation. Flight Duty Time Limitations (FDTL) for HEMS operations shall be separately approved because the existing FDTL scheme is inadequate to cater to issues peculiar to HEMS which is characterised by short flight times of average 30-45 min duration but long duty periods since this is a standby service.

10. AMT CERTIFICATION

10.1 AMT certification shall be extended to operators seeking AMT by granting acceptance for AA operations or granting approval for HEMS operations, after it has demonstrated compliance with the respective AMT

requirements. Such a certification may be suspended or revoked based on the following grounds:-

- (a) negligence in the delivery of AMT services including, but not limited to:
 - (i) malpractice and/ or substandard medical care or treatment; or
 - (ii) using non-licensed personnel or personnel performing outside the standard of care/scope of practice; or
 - (iii) failure to have operational equipment or carry the required equipment, or inappropriate use of equipment during a flight; or
 - (iv) unauthorized disclosure of medical or other confidential information.
- (b) failure to maintain required documentation or compliance with the provisions of this CAR.

11. FEES

Fees for AMT certification on each aircraft shall be Rs Ten Thousand only

(B. S. Bhullar)
Director General of Civil Aviation

GUIDANCE MATERIAL ON CATEGORISATION OF PATIENTS

Priority This category gives an indication of the need and urgency for AMT.	
Priority	Explanation
1: urgent	Patient for whom AMT is necessary to save life or limb, or to avoid serious permanent disability.
2: priority	Patient who requires specialized treatment not available locally and who will suffer pain and disability unless evacuated with the least possible delay.
3: routine	Patient whose immediate treatment can be undertaken locally, but who would benefit from further treatment in advanced care.

Dependency This category gives an indication of the level of medical care required during AMT.	
Dependency	Explanation
1: high	Patient who requires intensive medical and nursing care in flight; may be ventilated and require intracranial pressure monitoring, central venous pressure or cardiac monitoring.
2: medium	Patient who, although not requiring intensive support, requires frequent monitoring and whose condition may deteriorate in flight; may require oxygen and multiple IV infusions and have drains and catheters in situ.
3: low	Patient whose condition is stable and is not expected to deteriorate in flight; requires nursing care and may need regular medical therapy while in flight.
4: minimal	Patient who does not require nursing or medical care in flight, but who may need help with mobility or with bodily functions.

Classification

This category defines the patient's need for space on the aircraft and gives an indication of the patient's mobility in the event of an aircraft emergency. It also describes the degree of supervision required for psychiatric patients.

Class	Explanation
1A: severely disturbed	Disturbed patient who will require very close supervision in flight; may also require sedation and even physical restraint.
1B: intermediate severity	Patient who is not disturbed before flight but who may react badly to flight and require sedation; needs close supervision.
1C: mildly disturbed psychiatric patients	Patient who is stable, cooperative and has proved reliable under pre-flight observation is at low risk of requiring sedation during flight.
2A: immobile stretcher patients	Patient who is unable to move without aid and who, in an aircraft emergency, would require assistance to leave the aircraft.
2B: mobile stretcher patients	Patient who requires a stretcher while in flight but who, in an emergency, could leave the aircraft without help.
3A: sitting patients	Patient who, in an emergency, would require help to leave the aircraft.
3B: sitting patients	Patient who in an emergency, could leave the aircraft unassisted.
4: walking patients	Patient who requires no nursing care and is able to travel unattended; may require assistance with their baggage.

MEDICAL MANIFEST FOR AA OPERATIONS			
<i>DATE OF AMT</i>	<i>FROM</i>	<i>TO</i>	
<i>REFERRING ENTITY</i>			
<i>TYPE OF AMT PAYLOAD</i> (Tick as appropriate)	<i>PATIENT(S), ORGAN, BLOOD, TISSUE, MEDICAL SUPPLIES, MEDICAL PERSONNEL</i>		
<i>DESCRIPTION OF AMT PAYLOAD</i>	<i>NAME</i>	<i>AGE</i>	<i>SEX</i>
(As appropriate name of patient(s) and ailment, OR Type of organ, blood, tissue, OR name(s) of medical personnel being transferred, OR medical supply description)			
<i>NAME AND QUALIFICATION OF ACCOMPANYING MEDICAL PERSONNEL</i>			
<i>SIGNATURE OF THE DOCTOR REPRESENTING THE REFERRING ENTITY</i>	<i>SIGNATURE OF THE PILOT IN COMMAND ACCEPTING AA FLIGHT</i>		

In triplicate – one copy AA operator, one copy referring entity and one copy in aircraft.

HELICOPTER AMT ROLES AND REQUIREMENTS

	AIR AMBULANCE	HEMS DAY	HEMS DAY & NIGHT
MINIMUM PLATFORM	Single engine helicopter	Single engine helicopter	Multi engine helicopter
MINIMUM PILOT REQUIREMENT	One	Two pilots; or one pilot plus qualified Technical Crew Member who is pilot licence holder; or one pilot plus qualified Technical Crew Member with autopilot equipped helicopter	Two
AMT SCOPE OF RESPONSE	Tertiary response and limited secondary response	Primary, secondary and tertiary response by day	Primary, secondary and tertiary response by day and night
OPERATIONAL CONCESSIONS	Nil. Considered like any other charter operation	Accelerated flight plan and freedom to land and operate out of incident site by day (subject to approval from Govt agencies)	Accelerated flight plan and freedom to land and operate out of incident site by day and night (subject to approval from Govt agencies)
PERMISSIBLE AEROMEDICAL PAYLOAD	Transport of patients, organs, blood, tissue, medical supplies, or medical personnel	Transport of patients, organs, blood, tissue, medical supplies, or medical personnel	Transport of patients, organs, blood, tissue, medical supplies, or medical personnel
AVIONICS	Standard avionics	Standard + Autopilot (if flown with a technical crew member) + Flight Recorder system + Flight tracking +	Standard + Flight Recorder system + Flight Tracking + UMS/FADEC + Wx Radar + HTAWS = No op range limit

<i>AVIONICS</i>		<p>UMS/FADEC = Op range limited 75 nm</p> <p>If Wx radar and HTAWS added = No op range limit. (Wx radar may be substituted by weather datalink in cockpit)</p>	
<i>MINIMUM ADDL EQUIPMENT</i>	Climate control except in case of medical personnel transfer	Climate control, wire strike protection, rotor hi-visibility paint scheme, Comm suite, EMS interiors, Medical equipment BLS	Climate control , wire strike protection, rotor hi-visibility paint scheme, hi-vis anti-coll, Comm suite, EMS interiors, Medical equipment ALS
<i>INTER-FACILITY OPS</i>	Yes	Yes	Yes
<i>LANDING FLEXIBILITY</i>	Prior approval required if other than airport/ designated helipad. May take upto 24 hrs	No approval required. Full flexibility (subject to approval from Govt agencies)	No approval required. Full flexibility (subject to approval from Govt agencies)
<i>HOIST OPERATIONS</i>	No	Yes	Yes
<i>STRETCHER FOR PATIENTS</i>	Yes	Yes	Yes
<i>MEDICAL PERSONNEL REQUIREMENT</i>	Yes (if carrying patients)	Yes	Yes
<i>ROLE INTERCHANGE</i>	Can be used for any charter ops	Limited to HEMS and hoist rescue only	Limited to HEMS and hoist rescue only
<i>REGULATORY APPROVAL</i>	Acceptance required	Approval required	Approval required