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Helicopter Medical Transport (HMT) Safety Circular

Approved by the Secretary General
and published under his authority

International Civil Aviation Organization

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GLOSSARY

ABBREVIATIONS

ACAS	Airborne collision avoidance system
AGL	Above ground level
AMC	Air medical crew
AMPA	Air Medical Physician Association
AMRM	Air medical resource management (CRM for the entire crew and support staff)
ATC	Air traffic control
CFIT	Controlled flight into terrain
CRM	Crew resource management
CTOL	Collision with obstacle(s) during take-off and landing
EASA	European Aviation Safety Agency
EGPWS	Enhanced ground proximity warning system
FSM	Flight support member
FTDS	Flight training devices
GPS	Global positioning system
HAI	Helicopter Association International
HEMS	Helicopter emergency medical service
HMT	Helicopter medical transport
HMTSG	Helicopter Medical Transport Sub-Group
HOGE	Hover-out-of-ground effect
IFR	Instrument flight rules
IHST	International Helicopter Safety Team
IIMC	Inadvertent instrument meteorological conditions
IMC	Instrument meteorological conditions
LOC-I	Loss of control in flight
LOFT	Line-oriented flight training
LZ	Landing zone
NVG	Night vision goggles
NVIS	Night vision imaging system
ODP	Operational decision point
PinS	Point-in-space
QM	Quality management
RNP AR	Required navigation performance authorization required
SARPs	Standards and Recommended Practices
SBAS	Satellite-based augmentation system
sm	Statute mile
SMS	Safety management system
SOPs	Standard operating procedures
TCAS	Traffic alert and collision avoidance system
TT	Total flight experience
US NTSB	United States National Transportation Safety Board
VFR	Visual flight rules
VMC	Visual meteorological conditions

TERMINOLOGY

For the purpose of this document the following terms are used:

Air medical crew (AMC) member. A medically qualified person (e.g. paramedic, nurse, or physician) assigned to an HMT flight team who has received flight safety and emergency procedures training specific to aircraft type, operational environment, and crew composition. That person may be assigned limited flight safety duties including passenger briefing and supervision, company radio communications, loading/unloading, etc.

*Note.— The terms **Air medical crew member** and **Flight medical crew member** are used synonymously around the world.*

Cultural lighting. Artificial, human-made lighting which increases the overall illumination of the night environment and helps define physical features and spatial relationships when viewed through night vision goggles (NVG). Cultural lighting includes street, vehicle, obstruction, and building lights.

Facility. A hospital or other health care facility with a certified or pre-surveyed, designated landing site for the pick-up and delivery of patients.

Flight support member (FSM). An HMT crew member (e.g. AMC or other crew member) assigned by the operator to support the pilot in selected flight tasks in addition to his or her normal flight safety duties.

Flight-following. The recording in real time of departure and arrival messages by operational personnel to ensure that a flight is operating and has arrived at the destination aerodrome.

Helicopter medical transport (HMT). A dedicated helicopter air medical operation which transports patients from scene landing zones to certified or pre-surveyed landing sites at health care facilities (scene response), and between such facilities (inter-facility).

Note.— For the purposes of this circular, an HMT flight includes all legs associated with a patient dispatch request, including the non-patient outbound response and repositioning legs of an HMT flight. It is intended that the following flight legs be regarded as integral parts of the HMT flight:

- a) to and from the scene landing zone;
- b) to and from a heliport for the delivery or pick-up of medical supplies and/or persons required for the completion of the HMT flight; and
- c) to and from a heliport for refuelling which is required for the continuation of the HMT flight or for its return to flight-ready status for the next HMT dispatch.

Landing zone (LZ). A commonly used term within the HMT industry for a helicopter landing site, particularly when referring to the landing and manoeuvring area at an ad hoc, unprepared landing site.

Look under. Visually “looking under” helmet-mounted night vision goggles (NVG) to scan the cockpit and external environment unaided (i.e. without looking through the NVG image intensification tubes).

Operational decision point (ODP). A point that has been reached in an HMT operation where the pilot-in-command is required to alter the flight to resolve a real or perceived increase in the risk of the mission.

Note.— An ODP can occur on the ground as well as in flight.

Scene. An accident or incident site or other emergency response location where medical assistance is required.

Scene LZ selection. The process of ranking and selecting the various options for the most appropriate landing site at, or near, a scene location. The lowest risk LZ which meets the patient transport medical care objectives on a case-by-case basis should be selected. Appropriate mitigation measures should be applied as LZ risk increases. (See *scene LZ risk mitigation hierarchy in 3.2.*)

Specified operational area. An area defined by the operator in the operations manual to the satisfaction of the authority, taking into account the following:

- a) adequate ground reference;
- b) flight-following system for the duration of the HMT flight;
- c) reliability of meteorological conditions reporting facilities;
- d) the helicopter minimum equipment list;
- e) meteorological minima;
- f) any additional considerations due to specific local conditions; and
- g) appropriate navigation equipment/infrastructure.

EXPLANATORY NOTES ON TERMINOLOGY

Flight support member (FSM). The flight duties assigned to the FSM should improve flight safety and reduce pilot workload. Examples of appropriate duties include, but are not limited to, detection of obstacles, selection of landing sites, collision avoidance, reading checklists, monitoring flight parameters, company communication and navigation assistance, monitoring and assisting in ODP compliance, and shared flight safety decision-making. To provide assistance with ATC communications, the FSM should have a certificate (e.g. pilot licence) issued in accordance with Annex 1 — *Personnel Licensing*. The FSM should receive sufficient and appropriate ground-, flight- and scenario-based approved training to effectively carry out his or her flight support tasks and responsibilities. The FSM should demonstrate competency and currency on a regular basis.

Helicopter medical transport (HMT). HMT includes a pre- and inter-healthcare facility, emergency time-critical response, and transport of non-emergency patients between facilities. Regardless of the patient's condition and level of care, all HMT operations are considered to be routine from an aviation flight safety perspective. HMT operations should conform to best aviation safety practices and decision-making. In this sense, the term HMT includes, expands upon and qualifies the often used term "helicopter emergency medical service (HEMS)".

Operational decision point (ODP). By necessity, HMT flights often launch with a minimum amount of planning time. Changes in meteorological conditions, route or other operational considerations can result in a heavily task-loaded crew member unaware that their risk profile is escalating. Flight crews should be trained to apply techniques and procedures including threat and error management techniques that will allow them to continually assess their ongoing mission's level of risk and confirm that pre-launch decisions remain valid. Risk mitigation and avoidance measures may include a decision to delay or cancel departure, change routing, return to base, make an immediate landing, or any number of other safe options which may be available to the pilot(s). In every case, the action taken upon reaching an ODP should be appropriate to the triggering criteria.

Operators should establish ODP guidelines which define flight parameters such as minimum en-route IMC avoidance airspeed and altitude above ground¹, a reduction in estimated flight visibility below a predetermined distance and other objective considerations signifying that an ODP has been reached (trigger points). All personnel involved in flight operations should be trained to recognize key ODP triggers and risk factors including subjective indicators such as a generalized increase in concern and discomfort among crew members. If established parameters are violated or a safety concern is expressed by HMT team members (including on-board flight and medical crew, support personnel such as dispatch and maintenance personnel, and other mission responders), then an ODP has been reached and appropriate action must be taken. Pilots should be trained to identify ODPs and to take appropriate action on a recurrent basis.

Scene LZ selection. Ad hoc scene LZs which have not been prepared by trained ground first responders are generally higher risk landing sites than LZs which have been properly prepared, which in turn are higher risk than pre-surveyed, designated LZs. This results in a scene risk mitigation hierarchy where additional safety measures should be used by the pilot(s) to identify and avoid obstacles and hazards when operating to and from unprepared and non-designated LZs and at LZs where no ground support is available.²

Specific operational areas. In defining a specific operational area, the operator should take into account the cultural lighting, local hazards and topography. In those areas where the cultural lighting, hazards and topography make it unlikely that the visual cues diminish enough to make flying of the aircraft problematic, an HMT flight support member is assumed to be able to adequately assist the pilot, since under such circumstances instrument and control monitoring would not be required. In areas where visual cues may be limited or frequently degraded in adverse conditions³ operations should be conducted with two pilots.

The following are considered implied tasks that should already be inherent to the operation:

- a) minimum crew qualification, initial and recurrent training;
- b) continuity of a crew concept; and
- c) operating procedures, including crew coordination.

-
1. Pilot(s) will normally slow down and/or descend in order to maintain adequate visual reference as en-route meteorological conditions deteriorate. As the flight continues, if a reduction in airspeed or altitude below the ODP guidelines is required to maintain comfortable and safe visual reference, appropriate flight abort or diversionary action should be taken.
 2. These measures may include additional high- and low-level reconnaissance using night-vision goggles (NVG) for night landings at unprepared sites, the ability to hover-out-of-ground effect to assess hazards prior to landing and to disperse obscurants, etc.
 3. No or minimal cultural lighting, traverse of large areas of white-out, brown-out, or glassy water; shadowing; sky glow or other NVG illusions and effects; limited meteorological condition reporting; unstable meteorological patterns, isolated mountainous terrain, etc.