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FOCA Certification Leaflet (CL)

Helicopter Emergency Medical Service

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List of abbreviations and acronyms

The following abbreviations and acronyms are within this Certification Leaflet:

Abbreviations	Acronyms
AEO	all-engines-operative
AFM	aircraft flight manual
AMC	acceptable means of compliance
AOC	air operator certificate
CAT	commercial air transport
CL	certification leaflet
CPL	commercial pilot licence
CRM	crew resource management
CS	certification specifications
DG	dangerous goods
DPATO	defined point after take-off
DPBL	defined point before landing
EFB	electronic flight bag
EC	European Community
ELT	emergency locator transmitter
ERP	emergency response plan
EU	European Union
FOCA	Federal Office of Civil Aviation
FATO	final approach and take-off area
FC	flight crew
FCL	flight crew licensing
FSTD	Flight simulation training device
FFS	full flight simulator
FI	flight instructor
FMS	flight management system
FNTP	flight and navigation procedures trainer
FTE	full time equivalent
FTL	flight and duty time limitations
GM	Guidance Material
GPS	global positioning system
GPWS	ground proximity warning system
H	helicopter
HEMS	helicopter emergency medical service
HHO	helicopter hoist operation
HIGE	hover in ground effect
HOGE	hover out of ground effect
HUMS	health usage monitor system
ICAO	International Civil Aviation Organization
IDE	instrument, data equipment
IFR	instrument flight rules
IGE	in ground effect
IMC	instrument meteorological conditions
IR	Implementing Rule
IR	instrument rating
JAA	Joint Aviation Authorities
JAR	Joint Aviation Requirement
kt	knots
LDA	landing distance available
LDP	landing decision point
LVO	low visibility operation
MCTOM	maximum certified take-off mass
MEL	minimum equipment list
MLR	manuals, logs and records
MMEL	master minimum equipment list

Abbreviation	Acronyms
MNPS	minimum navigation performance specifications
MOPSC	Maximum operational passenger seating configuration
NM	nautical miles
NPA	notice of proposed amendment
NVD	night vision device
NVG	night vision goggles
NVIS	night vision imaging system
OAT	outside air temperature
OEI	one-engine-inoperative
OGE	out of ground effect
OM	operations manual
OPC	operators proficiency check
ORO	organisation requirements for air operations
PBN	performance-based navigation
PIC	pilot-in-command
PIS	public interest site
POH	pilot's operating handbook
PCDS	personnel carrying device system
RAD	radio altimeter
RCC	rescue coordination centre
ROD	rate of descent
RTODAH	rejected take-off distance available (helicopters)
RTODRH	rejected take-off distance required (helicopters)
SAR	search and rescue
SMM	safety management manual
SMS	safety management system
SOP	standard operating procedure
SPA	operations requiring specific approvals
SPO	specialised operations
STC	supplemental type certificate
TAWS	terrain awareness warning system
TC	technical crew
TC	type certificate
TCAS	traffic collision avoidance system
TDP	take-off decision point
TI	technical instructions
TODAH	take-off distance available
TODRH	take-off distance required
UMS	usage monitoring system
V_2	take-off safety speed
VMC	visual meteorological conditions
VFR	visual flight rules
VTOL	vertical take-off and landing
VTOSS	take-off safety speed
VMC	visual meteorological conditions
ZFM	zero fuel mass

Definitions for terms used in this Certification Leaflet

'alternative means of compliance' means those means that propose an alternative to an existing acceptable means of compliance or those that propose new means to establish compliance with Regulation (EC) No 216/2008 and its Implementing Rules for which no associated AMC have been adopted by the Agency;

'category A with respect to helicopters' means a multi-engined helicopter designed with engine and system isolation features specified in the applicable airworthiness codes and capable of operations using take-off and landing data scheduled under a critical engine failure concept that assures adequate designated surface area and adequate performance capability for continued safe flight or safe rejected take-off in the event of engine failure;

'category B with respect to helicopters' means a single-engined or multi-engined helicopter that does not meet category A standards. Category B helicopters have no guaranteed capability to continue safe flight in the event of an engine failure, and unscheduled landing is assumed;

'congested area' means in relation to a city, town or settlement, any area which is substantially used for residential, commercial or recreational purposes;

'crew member' means a person assigned by an operator to perform duties on board an aircraft;

'final approach and take-off area (FATO)' means a defined area for helicopter operations, over which the final phase of the approach manoeuvre to hover or land is completed, and from which the take-off manoeuvre is commenced. In the case of helicopters operating in performance class 1, the defined area includes the rejected take-off area available;

'flight simulation training device (FSTD)' means a training device which is:

(a) in the case of aeroplanes, a full flight simulator (FFS), a flight training device (FTD), a flight and navigation procedures trainer (FNPT), or a basic instrument training device (BITD);

(b) in the case of helicopters, a full flight simulator (FFS), a flight training device (FTD) or a flight and navigation procedures trainer (FNPT);

'ground emergency service personnel' means any ground emergency service personnel (such as policemen, firemen, etc.) involved with helicopter emergency medical services (HEMSs) and whose tasks are to any extent pertinent to helicopter operations;

'helicopter' means a heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes;

'HEMS crew member' means a technical crew member who is assigned to a HEMS flight for the purpose of attending to any person in need of medical assistance carried in the helicopter and assisting the pilot during the mission;

'HEMS flight' means a flight 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, by carrying:

(a) medical personnel;

(b) medical supplies (equipment, blood, organs, drugs); or

(c) ill or injured persons and other persons directly involved;

'HEMS operating base' means an aerodrome at which the HEMS crew members and the HEMS helicopter may be on stand-by for HEMS operations;

'HEMS operating site' means a site selected by the commander during a HEMS flight for helicopter hoist operations, landing and take-off;

'hostile environment' means:

(a) an environment in which:

(i) a safe forced landing cannot be accomplished because the surface is inadequate;

(ii) the helicopter occupants cannot be adequately protected from the elements;

(iii) search and rescue response/capability is not provided consistent with anticipated exposure; or

(iv) there is an unacceptable risk of endangering persons or property on the ground;

(b) in any case, the following areas:

(i) for overwater operations, the open sea areas north of 45N and south of 45S designated by the authority of the State concerned;

(ii) those parts of a congested area without adequate safe forced landing areas;

'local helicopter operation' means a commercial air transport operation of helicopters with a maximum certified take-off mass (MCTOM) over 3 175 kg and a maximum operational passenger seating configuration (MOPSC) of nine or less, by day, over routes navigated by reference to visual landmarks, conducted within a local and defined geographical area specified in the operations manual;

'maximum operational passenger seating configuration (MOPSC)' means the maximum passenger seating capacity of an individual aircraft, excluding crew seats, established for operational purposes and specified in the operations manual. Taking as a baseline the maximum passenger seating configuration established during the certification process conducted for the type certificate (TC), supplemental type certificate (STC) or change to the TC or STC as relevant to the individual aircraft, the

MOPSC may establish an equal or lower number of seats, depending on the operational constraints;

'medical passenger' means a medical person carried in a helicopter during a HEMS flight, including but not limited to doctors, nurses and paramedics;

'non-hostile environment' means an environment in which:

(a) a safe forced landing can be accomplished;

(b) the helicopter occupants can be protected from the elements; and

(c) search and rescue response/capability is provided consistent with the anticipated exposure.

In any case, those parts of a congested area with adequate safe forced landing areas shall be considered non-hostile;

'operating site' means a site, other than an aerodrome, selected by the operator or pilot-in-command or commander for landing, take-off and/or external load operations;

'operation in performance class 1' means an operation that, in the event of failure of the critical engine, the helicopter is able to land within the rejected take-off distance available or safely continue the flight to an appropriate landing area, depending on when the failure occurs;

'operation in performance class 2' means an operation that, in the event of failure of the critical

engine, performance is available to enable the helicopter to safely continue the flight, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which cases a forced landing may be required;

'operation in performance class 3' means an operation that, in the event of an engine failure at any time during the flight, a forced landing may be required in a multi-engined helicopter and will be required in a single-engined helicopter;

'pilot-in-command' means the pilot designated as being in command and charged with the safe conduct of the flight. For the purpose of commercial air transport operations, the 'pilot-in-command' shall be termed the 'commander';

'public interest site (PIS)' means a site used exclusively for operations in the public interest;

'safe forced landing' means an unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface;

'technical crew member' means a crew member in commercial air transport HEMS, HHO or NVIS operations other than a flight or cabin crew member, assigned by the operator to duties in the aircraft or on the ground for the purpose of assisting the pilot during HEMS, HHO or NVIS operations, which may require the operation of specialised on-board equipment;

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CL 0 Introduction

All Certification Leaflets (CL) are intended to assist the organisation/operator in the implementation of relevant matters into the activities and document system of the organisation/operator, as well as to ensure compliance with legal requirements. It is to be considered a tool for the organisation/operator in order to ease processes of obtaining required and defined acceptances, approvals and authorisations issued by the Federal Office of Civil Aviation (FOCA). Using the CL will facilitate establishing compliance with defined requirements and will lead through the respective certification or variation process. This is achieved by the presentation of key questions to be used by the organisation/operator to question completeness and compliance of the information contained in the respective document system by performing a self-assessment prior to submitting the documentation to the FOCA.

It is important to understand that the FOCA will use the identical CL when evaluating regulatory compliance with a specific requirement. The CL is also used as a checklist when performing the authorities' technical inspection/assessment? during the certification or variation process. The questions used by the organisation/operator during the self-assessment are identical to those used by the inspector during the evaluation process.

0.1. Purpose of this CL

The purpose of this certification leaflet is to provide:

- an overview of the general requirements of an HEMS approval;
- guidance on the possibility of developing the necessary HEMS content of the operations manual;
- a self-assessment tool for organisations to verify compliance with the relevant legal requirements; and
- a certification tool for the competent authority to conduct document evaluation regarding compliance with the relevant legal requirements.

0.2. Scope

The material in this CL covers all aspects of requirements for HEMS approval. It will help the applicant to implement the necessary content in the company's operations manuals to comply with the requirements. The questions in this CL are derived from the relevant implementing rules (IR), their related applicable means of compliance (AMC) and guide material (GM). Different (e.g. company's solution) means of compliance are subject to a separate certification process.

Other specific approvals, often used in connection with HEMS operations (e.g. NVIS and HHO), are also open to "standard" commercial activities, and therefore form the content of different CLs.

The examples provided in this CL may be incomplete and solely represent one possible means of how to provide the required data. An organisation must add further information or adapt the examples to their specific needs in accordance with the necessary requirements.

Definitions for terms used in are listed on page "DEF 1 and 2" or are outlined and explained within the reference boxes.

0.3. Terms and conditions

In the context of this Certification Leaflet, the terms listed below shall have the following meaning:

Term	Meaning	Reference
shall, must, will	These terms express an obligation, a positive command.	EC English Style Guide: Ch. 7.19
may	This term expresses a positive permission.	EC English Style Guide: Ch. 7.21
shall not, will not	These terms express an obligation, a negative command.	EC English Style Guide: Ch. 7.20
may not, must not	These terms express a prohibition.	EC English Style Guide: Ch. 7.20
need not	This term expresses a negative permission.	EC English Style Guide: Ch. 7.22
should	This term expresses an obligation when an acceptable means of compliance should be applied .	EASA Acceptable Means of Compliance publications FOCA policies and requirements
could	This term expresses a possibility.	http://oxforddictionaries.com/definition/english/could
ideally	This term expresses a best possible means of compliance and/or best experienced industry practice.	FOCA recommendation

To highlight an information or editorial note, a specific note box is used.

- The use of the male gender should be understood to include male and female persons.

0.4. Legal and Reference

This CL is based on the legal references listed below:

Legal Reference	**Issue**	**Subject**
State the legal documents	Date of Issue	Brief description of the content
Basic Regulation (EC) No 216/2008	20.02.2008	Common rules in the field of civil aviation and establishing a European Aviation Safety Agency
Commission Regulation (EU) No 965/2012	05.10.2012	Technical requirements and administrative procedures related to air operations Annex I: DEF; Annex II: Part-ARO; Annex III: Part-ORO; Annex IV: Part-CAT; Annex V: Part-SPA
Commission Regulation (EU) No 1178/2011	03.11.2011	Technical requirements and administrative procedures related to civil aviation aircrew Annex I: Part-FCL; Annex II: Conversion of existing national licences and ratings; Annex III: Acceptance of Licences of third countries; Annex IV: Part-MED
Commission Regulation (EU) No 748/2012	03.08.2012	Implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations
Commission Regulation (EU) No 2042/2003	20.11.2003	Continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks
AMC & GM to Regulation Air Operations Annex III / Part-ORO	25.11.2012	Regulation Air Operations Annex III / Part-ORO: “Organisation Requirements Air Operations: Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Part-ORO
AMC & GM to Regulation Air Operations Annex V / Part-SPA	19.04.2012	Regulation Air Operations Annex III / Part-SPA: “HEMS Approval”: Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Part-SPA

0.5. Organisation/Operator Responsibilities

Helicopters shall only be operated for the purpose of HEMS operations if the operator has been approved by the competent authority.

To obtain such approval by the competent authority, the operator shall:

- operate in CAT and hold a CAT AOC in accordance with Annex III (Part-ORO);
- demonstrate to the competent authority compliance with the requirements contained in Subpart SPA.HEMS (J).

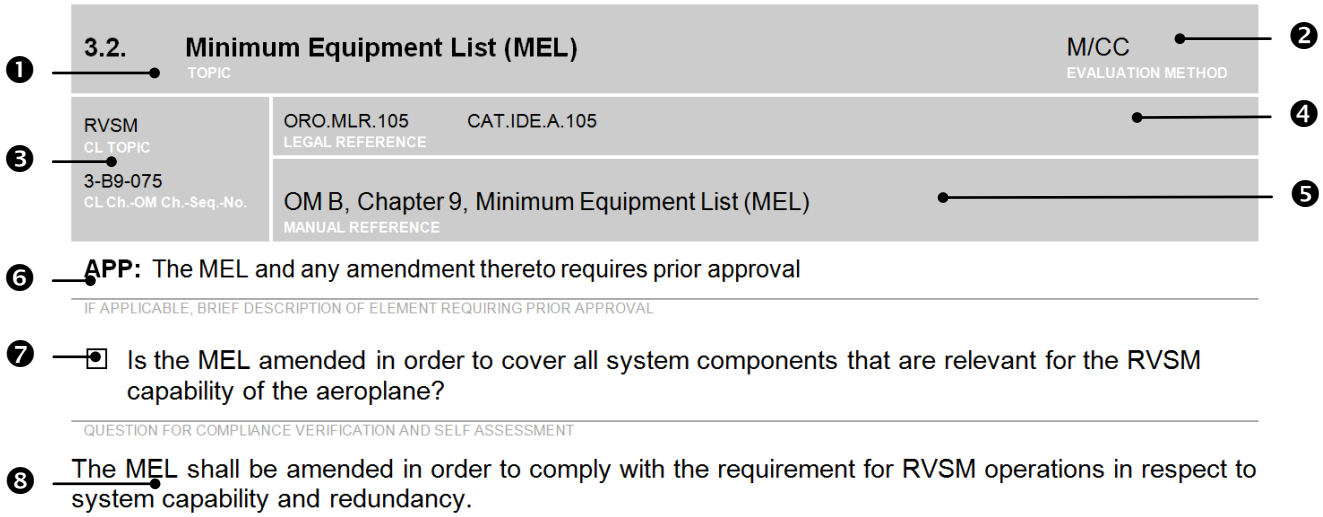
In addition to the requirements for commercial air-transport operations (CAT), HEMS operations must be compliant with a set of additional and different elements. Some of these elements are subject to a separate approval (e.g. operations to/from public interest sites).

The operator is responsible for ensuring that HEMS operations remain in compliance with the requirements of the applicable IR's and AMCs/GMs.

Note: Manuals must be structured in accordance with the relevant regulation: ORO.MLR.100 / AMC1 ORO.MLR.100 / AMC 3 ORO.MLR.100

0.6. Format of the CL

The CL consists of a standardised modular reference box system. The following illustration provides details of the defined format:



❶	Topic: subject description
❷	FOCA evaluation method
❸	FOCA / Topic Reference Number which may be used as identification in addition to interlink between this leaflet and the Document Evaluation Report (Finding Report). The Number consists of a combination of: - a subject code related to the specific topic/ theme; and - sequence number in the respective chapter of the CL. The above example 3-B9-075 indicates: RVSM = CL regarding RVSM Specific Approval, 3 = CL section; B9 = OM chapter under evaluation (here OM-B, Chapter 9.), followed by 075 = sequence number.
❹	Associated legal reference and/ or reference to other relevant publications including information on formal Acceptance (ACC) or Approval (APP) where applicable.
❺	Reference to the Part(s), Chapter(s) and/or Subchapters of the organisation's document systems or manual system as required by the applicable Part.
❻	If the legal provision requires a formal approval, a short description of the content of this approval is provided.
❼	Questions for self-assessment and compliance verification.
❽	Provides instructions, provisions, regulatory requirements, guidelines, acceptable means of compliance and examples of current best practice.

CL 1 Requirements related to HEMS

1.1. Specific approvals for specific operations

A commercial air transport operator (AOC holder) has to comply with the relevant provisions of Annex V (Part SPA) to EU Regulation No. 965/2012 when operating an aeroplane or helicopter for a specific operation (e.g. performance based navigation (PBN).

The FOCA is the competent authority for operators applying for specific approval and whose principal place of business is in Switzerland.

Part SPA (Annex V) to EU Regulation No 965/2012, divided into 10 subparts, contains operator requirements for operations requiring specific approvals:

- Supbart A contains general requirements (applicable to all specific approvals);
- Subarts B to J contain the requirements for each specific approval.

Only CAT operators may apply for operations with night vision googles (NVIS); helicopter hoist (HHO) and helicopter emergency medical service (HEMS).

1.2. Basic Regulation (EC) No 216/2008

The consolidated version of the Basic Regulation (EC) No 216/2008 of the European Parliament and of the Council states, as one of the essential requirements, that operators shall only operate an aircraft for the purpose of commercial air transport (hereinafter 'CAT') operations as specified in Annexes III and IV.

CAT operators shall comply with the relevant provisions of **Annex V** (SPA.HEMS) when operating helicopters used for helicopters used for commercial air transport emergency medical service operations (HEMS).

1.3. Implementing Rules and Acceptable Means of Compliance

At the moment, Implementing Rules have been set in force for Air Crew and Air Operations only. Those for ATM/ANS are currently in the legislative process. Those for Airworthiness will follow in the future.

AMCs are defined as non-binding standards adopted by the Agency to illustrate means to establish compliance with the Basic Regulation and its Implementing Rules.

The AMCs issued by the Agency are not of a legislative nature; therefore they cannot impose obligations on regulated persons who decide to show compliance with the applicable requirements by other means. However, as the intention of the lawmakers legislator in providing such material is to ensure legal certainty and contribute to uniform implementation, it must define competent authorities so that regulated persons complying with an Agency AMC can be recognised as complying with the law. This is why the adoption of such material by the EASA is subject to an open rulemaking process as prescribed by Article 52 of the Basic Regulation.

The questions attached to the boxes within this CL are based on Implementing Rules, AMCs and GMs. According to Swiss law, AMCs are as binding as IRs.

1.4. Elements of the HEMS requiring approval

The following elements of HEMS operations require prior approval by the FOCA:

- Airworthiness approval for medical equipment installation of and any modification;
- operations to and from public interest sites;
- training and checking programmes.

CL 2 Documentation and information – content of the operations manual (OM)

The operator shall ensure that, as part of its risk analysis and management process, risks associated with the HEMS environment are minimised by specifying in the operations manual: selection, composition and training of crews; levels of equipment and dispatch criteria; and operating procedures and minima, such that normal and likely abnormal operations are described and adequately mitigated.

Relevant extracts from the operations manual shall be made available to the organisation for which the HEMS is being provided.

Additionally to the general content as required by AMC3 ORO.MLR.100 the operations manual (OM) shall or the procedures manual (SOP) acc. AMC1 SPA.GEN.105(a) contain the following informations:

Content		Subchapter	CL	OM	Reference
1	Definitions, Introduction	• Definition of "HEMS" • Difference between air-ambulance and HEMS.	4.1	A 0.1.4 or SOP	SPA.HEMS.100 GM1 SPA.HEMS.100(a)
2	Risk analysis and management process (information and documentation)	• Risk analysis for HEMS operations • Hazards and risks associated with the HEMS environment • The operator shall ensure that, as part of its risk analysis and management process, are minimised by specifying in the operations manual: o selection, o composition and training of crews; o levels of equipment and dispatch criteria; o operating procedures and minima; o normal and likely abnormal operations are described and adequately mitigated risks associated with the HEMS environment, regarding operational requirements.	4.10	A 1.X A 4.X A 5.X A 3.X or OMM 3.X OMM 4.X B 8.X D 2.X or SOP	SPA.HEMS.100 GM1 SPA.HEMS.100(a) SPA.HEMS.140 AMC1SPA.HEMS.140
3	Equipment	• Helicopter's equipment, • Portable equipment on board and its use, • Survival and emergency equipment; • Oxygen supply; • Personal protection, • Optional equipment, e.g.: o Search light, o Rescue hoist, o Human External cargo equipment, o Fire fighting, o Night vision goggles, o Avalanche search system, o Radio altimeter, o Miscellaneous equipment	4.2 4.10	A 8.X B 2.1.1 B 8.X B, 9.X or SOP	SPA.HEMS.110 SPA.HEMS.140 AMC1 SPA.HEMS.140
4	Communication	• Radio equipment, • Transponder setting 7100 for HEMS; • Communication with: o operating centre; o emergency ground service personnel.	4.3	A 12.3 B 8.X B 9.X or SOP	SPA.HEMS.115

5	HEMS operating minima	• Definition of "HEMS operating minima" according table 1 of IR • Reduced visibility procedures • Commander's risk assessment • Visibility versus speed acc. table 1 of GM • Qualification – authorisation list (operator specifications)	4.4	A 8.1.5 A 8.3.1 A 12 or SOP	SPA.HEMS.120 GM1 SPA.HEMS.120 AMC1 SPA.HEMS.140
6	Performance requirements for HEMS operations	• Operations to/from hospital sites in congested hostile environment in performance class 1 • Helicopter conducting operations to/from HEMS operating site located in a hostile environment operated in performance class 2: take-off and landing procedures when operating without an assured safe forced landing capability: • Dimensions of operating sites (day/night); • Illumination for night operations (from ground or air)	4.5	B 1.X B 4.1 C 1.X or SOP	SPA.HEMS.125 GM1 SPA.HEMS.125(b)(3) and (b)(4) AMC1 SPA.HEMS.125(b)(4) CAT.POL.H.305(b)(2) and (3)
7	Helicopter operations to/from public interest site (PIS)	• List of public interest sites; • Performance requirements (PC 2, 8% climb gradient); • Site specific procedures that minimize the period in which there would be danger to helicopter occupants and persons on the surface in the event of an engine failure during take-off and landing; o Description of take-off and landing procedures/profiles within performance class 2 (to minimize the exposure time) • A diagram or annotated photograph, showing: o main aspects, o dimensions, o non-conformance with requirements for performance class 1, o main hazards and o contingency plan should an incident occur; o Specific training for flight crew; • Description of the set of conditions allowing operations without an assured safe forced landing capability; • Operations on PIS in other Member States: endorsement from the competent authority of that State; • Specific training.	4.6 4.7	B 1.X B 2.X B 4.1 C 1.X D 2.1 or SOP	CAT.POL.H.225 CAT.POL.H.305(b)(2), (b)(3) SPA.HEMS.125(b)(2) Paragraph 6 of Art. 6 to Decision 965/2012
7	Operating Procedures Normal, abnormal, emergency	• Flight planning; • Pre-flight; • Mass and balance; • Loading; • Performance calculation;	4.13	A1.X A4.X A 8.X B 11	SPA.HEMS.140 AMC1 SPA.HEMS.140

	procedures	• Normal operation; • guidance on/for: o take-off and landing procedures at previously unsurveyed HEMS operating sites; o selection of HEMS operating site (surveyed and unsurveyed); o routes for regular flights to surveyed sites, including the minimum flight altitude; • the safety altitude for the area overflown; • Abnormal operation o Deviations from standard procedures • Emergency procedures o procedures to be followed in case of inadvertent entry into cloud; o emergency evacuation		D 2.X or SOP	
7	Crew requirements	• selection criteria of crew members; • conditions for assignment to duties; • minimum experience for the commander/PIC (day/night); • initial and operational training; • recency e.g.: 30mins instrument flight time FSTD training in the last six months; • minimum crew day/night, VFR/IFR; • conditions for reduction to one pilot (night), e.g.: definition of a specific geographical area; • Crew composition, • Crew training and checking syllabus/ programme: o initial training; o operational training; o conversion training; o difference training; o familiarization training; o recurrent training; o refresher training • crew coordination concept; • tasks of the HEMS technical crew member; • delegation of aviation tasks to the HEMS technical crew member (in flight, on ground); • requirement to complete operational training.	4.7 4.8	A 1.X A 4.X A 5.X B 8.X D 2.X or SOP	ORO.TC.100 ORO.TC.105 GM1 ORO.TC.105 ORO.TC.110 AMC1 ORO.TC.110 ORO.TC.115 AMC1 ORO.TC.110 ORO.TC.120 ORO.TC.125 AMC1 ORO.TC.120 & 125 AMC2 ORO.TC.120 & 125 ORO.TC.130 ORO.TC.135 AMC1 ORO.TC.135 ORO.TC.140 AMC1 ORO.TC.140 SPA.HEMS.130 AMC1 SPA.HEMS.130(b)(2) AMC1 SPA.HEMS.130(e) GM1 SPA.HEMS.130(e)(2)(ii) AMC1 SPA.HEMS.130(e)(2)(ii)(B) AMC1 SPA.HEMS.130(f)(1) AMC1 SPA.HEMS.130(f)(2)(ii)(B)
			4.9	A 1.X A 4.X A 5.X B 8.X or SOP	
			4.10 4.11	A 1.X A 4.X A 5.X B 8.X C 1.X C 2.X or SOP	
8	HEMS medical passenger and other personnel briefing	• Medical passenger o familiarisation with the helicopter type(s) operated; o entry and exit under normal and emergency conditions both for	4.12	A 5.X A 8.3X D 2.X or	SPA.HEMS.135 AMC1.1 SPA.HEMS.135(a) AMC1 SPA.HEMS.135(b)

		self and patients; o use of the relevant on-board specialist medical equipment; o need for commander's approval prior to using specialised equipment; o method of supervision of other medical staff; o use of helicopter inter-communication systems; and o location and use of on board fire extinguishers. • Medical patient • Ground emergency service personnel o two-way radio communication procedures with helicopters; o selection of suitable HEMS operating sites for HEMS flights; o physical danger areas of helicopters; o crowd control in respect of helicopter operations; and o evacuation of helicopter occupants following an on-site helicopter accident		SOP	
9	HEMS operating base facilities	• Facilities for planning all tasks e.g.: weather forecast, NOTAM, DABS; ATS.	4.14	OMM 1.X or A 8.X or SOP	SPA.HEMS.145
10	Fuel supply	• Fuel policy; • Final reserve fuel day/night; VFR/IFR	4.15	A 8.X B 5.2 or SOP	SPA.HEMS.140 AMC1 SPA.HEMS.140 SPA.HEMS.150 CAT.POL.MPA.150
11	Refuelling with passengers embarking, on board or disembarking	• Position of door(s) on refuelling side of helicopter, • Position of door(s) on non-refuelling side of helicopter; • fire fighting facilities; • personnel available to move patients clear of the helicopter in the event of a fire.	4.16	A 8.3.15 or SOP	SPA.HEMS.155
12	Flight and duty time limitations	• max. flight hours per day/week/year • max. duty hours per day/week/year • max. standby time • min. rest time after duty • break • flight duty period • notification time • reporting time • readiness • rest day • rest period • "on call duty" • "stand-by" day/period • Airport standby • Unforeseen circumstances		A 7.X or SOP	VBR I Commission Regulation Commission Regulation XY No published yet: FTL for HEMS

CL 3 Specific approvals

3.1. General requirements TOPIC					M/CC EVALUATION METHOD
HEMS CL TOPIC	SPA.GEN.100 LEGAL REFERENCE	SPA.GEN.105	SPA.GEN.110	SPA.GEN.115	SPA.GEN.120
3-OMA0-05 CL Ch.-OM Ch.-Seq.-No.	OM A, chapter 0.X “introduction“ OM A, chapter 0.2 “system of amendment and revision” MANUAL REFERENCE				

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

General:

☐ Does the commercial air transport (CAT) operator have its principle place of business in Switzerland?

☐ Has the operator applying for a specific approval provided the required documentation and information?:

- the name, address, mailing address of the applicant and
- a description of the intended operation?

☐ Has the operator provided the following evidence?:

- compliance with the requirements of the applicable Subpart and
- the relevant elements defined in the data established in accordance with Regulation (EC) No 748/2012 have been taken into account.

☐ Does the operator retain records related to the required documentation for the approval at least for the duration of the SPA operation ?

☐ Is the scope of activity that the operator (AOC holder) is approved to conduct documented and specified in the operations specifications to the AOC?

☐ Does the operator require himself to provide the FOCA with the relevant documentation when conditions of a specific approval are affected by changes?

☐ Does the operator specify that the SPA only remains valid if the operator remains in compliance with the requirements associated with the SPA and the relevant elements in accordance with Regulation (EC) No 748/2012?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

DOCUMENTATION (AMC1 SPA.GEN.105(a))

(a) Operating procedures should be documented in the operations manual.

(b) If an operations manual is not required, operating procedures may be described in a procedures manual (SOP).

CL 4 Helicopter emergency medical service (HEMS) approval

4.1. HEMS operations TOPIC	M/CC EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.100 LEGAL REFERENCE
4-OMA0-005 Ch.-OM Ch.-Seq.-No.	OM A, chapter 0.1.X “explanations and definitions“ MANUAL REFERENCE

APP: Helicopter operation for the purpose of HEMS has to be approved by the competent authority.

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

- ☐ Is the operation in CAT and does the operator hold a CAT AOC in accordance with Annex III (Part-ORO)?
- ☐ Has the operator demonstrated to the authority that it is in compliance with the requirements in Subpart “HEMS” (J)?
- ☐ Is the term “HEMS” defined in the OM?
- ☐ Is the difference between HEMS and Air Ambulance described in the OM?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Definitions

‘HEMS flight’ means a flight 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, by carrying:

(a) medical personnel;

(b) medical supplies (equipment, blood, organs, drugs); or

(c) ill or injured persons and other persons directly involved.

HELICOPTER EMERGENCY MEDICAL SERVICES (HEMS) FLIGHT

(a) A HEMS flight (or more commonly referred to as HEMS mission) normally starts and ends at the HEMS operating base following tasking by the ‘HEMS dispatch centre’. Tasking can also occur when airborne, or on the ground at locations other than the HEMS operating base.

(b) The following elements should be regarded as integral parts of the HEMS mission:

(1) flights to and from the HEMS operating site when initiated by the HEMS dispatch centre;

(2) flights to and from an aerodrome/operating site for the delivery or pick-up of medical supplies and/or persons required for completion of the HEMS mission; and

(3) flights to and from an aerodrome/operating site for refuelling required for completion of the HEMS mission.

The helicopter emergency medical service philosophy - GM1 SPA.HEMS.100(a)

HEMS approval

HEMS operations are conducted in accordance with the requirements contained in Annex IV (Part-CAT) and Annex III (Part-ORO), except for the variations contained in SPA.HEMS, for which a specific approval is required.

Operating under a HEMS approval

There are only two possibilities: transportation as passengers or cargo under the full auspices of OPS.CAT and Part-ORO (this does not permit any of the alleviations of SPA.HEMS - landing and take-off performance should be in compliance with the performance Subparts of Part-CAT), or operations under a HEMS approval as contained in this Subpart.

HEMS versus Air ambulance

In regulatory terms, air ambulance is considered to be a normal transport task where the risk is no higher than for operations to the full OPS.CAT and Part-ORO compliance. This is not intended to contradict/complement medical terminology but is simply a statement of policy; none of the risk elements of HEMS should be extant and therefore none of the additional requirements of HEMS need be applied.

To provide a road ambulance analogy:

(1) if called to an emergency: an ambulance would proceed at great speed, sounding its siren and proceeding against traffic lights - thus matching the risk of operation to the risk of a potential death (= HEMS operations);

(2) for the transfer of a patient (or equipment) where life and death (or consequential injury of ground transport) is not an issue: the journey would be conducted without sirens and within normal rules of motoring - once again matching the risk to the task (= air ambulance operations).

The underlying principle is that the aviation risk should be proportionate to the task.

It is for the medical professional to decide between HEMS or air ambulance - not the pilot. For that reason, medical staff who undertake to task medical sorties should be fully aware of the additional risks that are (potentially) present under HEMS operations (and the pre-requisite for the operator to hold a HEMS approval). (For example in some countries, hospitals have principal and alternative sites. The patient may be landed at the safer alternative site (usually in the grounds of the hospital) thus eliminating risk - against the small inconvenience of a short ambulance transfer from the site to the hospital.)

Once the decision between HEMS or air ambulance has been taken by the medical professional, the commander makes an operational judgement over the conduct of the flight.

Simplistically, the above type of air ambulance operations could be conducted by any operator holding an AOC (HEMS operators hold an AOC) - and usually are when the carriage of medical supplies (equipment, blood, organs, drugs etc.) is undertaken and when urgency is not an issue.

4.2. **Equipment requirements for HEMS operations** TOPIC		M/CC/IN EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.110 (EC) No 748/2012 LEGAL REFERENCE	
4-OMA/B-010 CL Ch.-OM Ch.-Seq.-No.	OM A, chapter 8.X “installation and use“ OM B, chapter 1.1.1 “certification” OM B, chapter 8.X “configuration deviation list” OM B, chapter 9.X ”minimum equipment list” MANUAL REFERENCE	

APP: Installation of medical equipment and any modification and, where appropriate, its operation in accordance with Regulation (EC) No 748/2012

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

General:

☐ Is the installation of all helicopter dedicated equipment and any subsequent modification and, where appropriate, its operation approved in accordance with Regulation (EC) No 748/2012?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

4.3. HEMS Communication TOPIC	M/CC/IN EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.115 LEGAL REFERENCE
4-OMA/B-015 CL Ch.-OM Ch.-Seq.-No.	OM A, chapter 12.3 “communication procedures” OM B, chapter 2.X “checklist” OM B, chapter 8.X “configuration deviation list” OM B, chapter 9.X ”minimum equipment list” MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

General:

☐ In addition to that required by CAT.IDE.H: do the helicopters conducting HEMS flights have communication equipment capable of conducting two-way communication with the organisation for which the HEMS is being conducted and, where possible, to communicate with ground emergency service personnel?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

4.4. HEMS operating minima TOPIC	M/CC EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.120 LEGAL REFERENCE
3-OMA-020 CL Ch.-OM Ch.-Seq.-No.	OM A, chapter 8.1.5 “operating minima” and OM A, chapter 8.3.1 “IFR/VFR policy” and OM A, chapter 12 “rules of the air” MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

General:

☐ Are the defined HEMS operating minima within the OM in accordance with table 1 of SPA.HEMS.120 for single and/or multi pilot operation for day and night (see below)?

☐ Flights under VMC: Does the OM require a flight to be abandoned or a return to base when weather conditions fall below the cloud base or visibility minima shown in table 1 of SPA.HEMS.120?

☐ Flight in reduced visibility (<5km): Does the OM ask the commander to assess the risk of flying temporarily into reduced visibility against the need to provide emergency medical service, taking into account the advisory speeds included in Table 1 of GM SPA.HEMS.120?

☐ When the operator permits (OM) flight with a visibility of less than 5 km: Does the OM require that the forward visibility should not be less than the distance travelled by the helicopter in 30 seconds, so as to allow adequate opportunity to see and avoid obstacles (GM SPA.HEMS.120)?

☐ Has the operator defined individual pilot limitations regarding operating minima (e.g. attachment to OM “pilot limitations/competence list”)?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Example

Operating minima - VFR

A commander/PIC shall only take-off if current and available meteorological reports (METAR) and forecasts (TAF) indicate that the meteorological conditions along the route or that part of the route to be flown under VFR will, at the appropriate time, be such as to render compliance with the limitations according the table “HEMS operating minima”.

A commander/PIC shall abort the flight and return to base or an alternative landing place (aerodrome, other base, hospital sites, operating site) where a safe landing is possible, when weather conditions fall below the cloud base or visibility minima shown in table “HEMS operating minima”.

Table “HEMS operating minima”

1 Pilot	
Day	
Ceiling	**Visibility**
500 ft and above	*As defined by the applicable airspace VFR minima*

400 – 499 ft	2’000 m
300 – 399 ft	3’000 m
Night	
Cloud base	Visibility
1’200 ft (**)	3’000 m

(**) During the en-route phase, cloud base may be reduced to 1’000 ft for short periods.

Performance class 3: The weather minima for the dispatch and en-route phase of a HEMS flight operated in performance class 3 shall be a cloud ceiling of 600 ft and a visibility of 1’500 m. Visibility may be reduced to 800 m for short periods when in sight of land if the helicopter is manoeuvred at a speed that will give adequate opportunity to observe any obstacle and avoid a collision.

Reduced visibility (less than 5 km)

Flying temporarily in reduced visibility, but not below HEMS operating minima table, is allowed, if the commander/PIC concludes that the higher risk is acceptable because of the need to provide emergency medical service: assessment of the aviation risk versus third parties, the crew and the aircraft indicates that it is proportionate to the task.

Since every situation is different it was not felt appropriate to define the short period in terms of absolute figures.

When flying in visibility of < 5 km, the visibility should not be less than the distance travelled by the helicopter in 30 seconds so as to allow adequate opportunity to see and avoid obstacles (see table below).

Visibility (m)	Advisory speed (kt)
800	50
1500	100
2000	120

4.5. Performance requirements for HEMS operations TOPIC	M/CC EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.125 CAT.POL.H.305 LEGAL REFERENCE
3-OMB/C-025 CL Ch.-OM Ch.-Seq.-No.	OM B, chapter 1.X “limitations” OM B, chapter 4.1 “performance” OM B, chapter 12 ”aircraft systems” OM C, chapter 1.12 “special operating site limitations” MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

- ☐ Helicopter conducting operations to/from HEMS operating site located in a hostile environment operated in performance class 2:
  - Is the operator compliant with CAT.POL.H.305(b)(2)?
  - Are the helicopters equipped with a monitoring system (e.g. UMS)?
- ☐ The helicopter is based at the hospital site which is in a congested hostile environment: Is the helicopter operated in accordance with performance class 1?
- ☐ Does the operator describe and require operating sites to be big enough to provide adequate clearance from all obstruction (day: at least 2xD; night 4xD) and illumination for night operations (from ground or air)?
- ☐ HEMS operations within PC3: does the operator require that such operations be performed only outside hostile environments?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

HEMS operations in performance class 2

CAT.POL.H.305(b)(2) and CAT.POL.H.305(b)(3)

A set of conditions have to be implemented (e.g. maintenance/modifications standards and preventive maintenance actions according the engine or engine manufacturer) and a usage monitoring system (UMS) has to be installed.

GM1 SPA.HEMS.125(b)(3) - PERFORMANCE CLASS 2 AT A HEMS OPERATING SITE

As the risk profile at a HEMS operating site is already well known, operations without an assured safe forced landing capability do not need a separate approval and the requirements do not call for the additional risk assessment specified in CAT.POL.H.305 (b)(1).

AMC1 SPA.HEMS.125(b)(4) - HEMS OPERATING SITE DIMENSIONS

(a) When selecting a HEMS operating site it should have minimum dimensions of at least 2 x D (the largest dimensions of the helicopter when the rotors are turning). For night operations, unsurveyed HEMS operating sites should have dimensions of at least 4 x D in length and 2 x D in width.

For night operations, the illumination may be either from the ground or from the helicopter.

Examples

Landing sites in congested and hostile environment

Operations to/from an operating site in a congested and hostile area have to be performed in performance class 1: The dimensions of the site and the obstacles in the approach and departure path allow during the whole operation (approach, go-around, touchdown and departure) to safely clear and avoid all obstacles and a safe forced landing or a safe continuation of the flight (=no additional risk for third parties nor property on the surface nor the occupants of and the helicopter itself), if one engine fails.

Landing sites in non-congested hostile environment

HEMS operations to/from an operating site in a non-congested hostile environment may be performed in performance class 2.

4.6. Helicopter operations to/from public interest site (PIS) TOPIC				M/CC/IN EVALUATION METHOD
HEMS CL TOPIC	CAT.POL.H.225	SPA.HEMS.125	CAT.POL.H.305	Paragraph 6 of Art. 6 to Decision 965/2012
	LEGAL REFERENCE			
3-OMA/B/D-030 CL Ch.-OM Ch.-Seq.-No.	OM B, chapter 1.X “limitations” OM B, chapter 2.X “normal procedures“ OM B, chapter 4.1 “performance” OM D, chapter 2.X “crew training” MANUAL REFERENCE			

APP: Helicopter operations to/from hospital sites in a congested hostile environment not performed in performance class 1 are subject to approval in accordance with CAT.POL.H.225

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

- ☐ Operations to/from public interest sites (hospital sites) in congested hostile environments in performance class 2: Does the operator hold an approval in accordance with CAT.POL.H.225 (in other member states: approval obtained from the competent authority of that State)?
- ☐ Was the public interest site in use before 1 July 2002?
- ☐ Does the size, obstacle environment or helicopter performance prevent compliance with the requirements for operation in performance class 1?
- ☐ Is the operation conducted with helicopters with an MOPSC of six or less?
- ☐ Does the helicopter achieve a climb gradient of 8% in still air at take-off safety speed (V_{TOSS}) with the critical engine inoperative and the remaining engine operating at an appropriate power rating?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

‘Exposure time’ means the actual period during which the performance of the helicopter with the critical engine inoperative in still air does not guarantee a safe forced landing or the safe continuation of the flight.

PUBLIC INTEREST SITE (GM1 CAT.POL.H.225)

An example of a public interest site is a landing site based at a hospital located in a hostile environment in a congested area, which due to its size or obstacle environment does not allow the application of performance class 1 requirements that would otherwise be required for operations in a congested hostile environment.

Problems with hospital sites

During implementation of JAR-OPS 3, it was established that a number of States had encountered problems with the impact of performance rules where helicopters were operated for HEMS. Although States accept that progress should be made towards operations where risks associated with a critical power unit failure are eliminated, or limited by the exposure time concept, a number of landing sites exist which do not (or never can) allow operations to performance class 1 or 2 requirements.

These sites are generally found in a congested hostile environment:

- in the grounds of hospitals; or

- on hospital buildings;

The problem of hospital sites is mainly historical and, whilst the Authority could insist that such sites not be used - or used at such a low weight that critical power unit failure performance is assured, it would seriously curtail a number of existing operations.

Even though the rule for the use of such sites in hospital grounds for HEMS operations (Appendix 1 to JAR-OPS 3.005(d) sub-paragraph (c)(2)(i)(A)) attracts alleviation until 2005, it is only partial and will still impact upon present operations.

Because such operations are performed in the public interest, it was felt that the Authority should be able to exercise its discretion so as to allow continued use of such sites provided that it is satisfied that an adequate level of safety can be maintained - notwithstanding that the site does not allow operations to performance class 1 or 2 standards. However, it is in the interest of continuing improvements in safety that the alleviation of such operations be constrained to existing sites, and for a limited period."The EASA adopted the JAA philosophy that, from 1 January 2005, approval would be confined to those sites where a CAT A procedure alone cannot solve the problem. The determination of whether the helicopter can or cannot be operated in accordance with performance class 1 should be established with the helicopter at a realistic payload and fuel to complete the mission. However, in order to reduce the risk at those sites, the application of the requirements contained in CAT.POL.H.225 (a) should be applied.

Additionally, and in order to promote understanding of the problem, the text contained in CAT.POL.H.225 (b) had been amended to refer to the performance class and not to Annex 14 as in the original appendix. Thus Part C of the operations manual should reflect non-conformance with performance class 1, as well as the site specific procedures (approach and departure paths) to minimise the danger to third parties in the event of an incident.

4.7.	**Helicopter operations to/from public interest site (PIS)** TOPIC	M/CC/IN EVALUATION METHOD
HEMS CL TOPIC	CAT.POL.H.225 CAT.POL.H.305 SPA.HEMS.125 Paragraph 6 of Art. 6 to Decision 965/2012 LEGAL REFERENCE	
4-OMB/C-35 Ch.-OM Ch.-Seq.-No.	OM B, chapter 3.X “abnormal and/or emergency procedures” OM C, chapter 1.X “heliports/operating sites” OM D, chapter 2.1 “training syllabus” MANUAL REFERENCE	

APP: Helicopter operations to/from hospital sites in a congested hostile environment not performed in performance class 1 are subject to approval in accordance with CAT.POL.H.225 (based on a risk assessment and the application of four principles).

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Has the operator implemented an operational risk assessment regarding defined a safety target (principle 1)?

- a safety target: e.g. exposure of max. 9’’ for twins;

☐ Has the operator assessed the helicopter reliability (principle 2)?

- e.g. manufactures’ power loss data for specific type of helicopter;

☐ Does the operator maintain within a continuing airworthiness environment (principle 3)?

☐ Has the operator implement mitigating procedures (principle 4)?

- Airworthiness:
  - Is the helicopter/engine attained, maintained and modified acc. standard defined by the manufacturer;
  - Are preventive maintenance actions conducted acc. as recommended by the helicopter or engine manufacturer;
  - Is there a system in place for reporting loss of power, engine shutdown or engine failure events to the manufacturer; and
  - a usage monitoring system (UMS) installed?

- Operation:
  - Are site specific procedures (take-off procedures/profiles within performance class 2 (to minimize the exposure time) described in OM part B (see example below)?
  - Do site specific procedures established in the operation manual minimise the period in which there would be danger to helicopter occupants and persons on the surface in the event of an engine failure during take-off and landing?
  - Are effective procedures to minimise the consequence should an engine failure occur defined;
  - Is a training for flight crew specified?

☐ Is there a diagram or annotated photograph showing the main aspects, dimensions, non-conformance with the requirements of performance class 1, the main hazards and the contingency plan should an incident occur?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

What defines performance class 2 (GM to Section 2, Chapter 3 performance class 2)

Performance class 2 can be considered as performance class 3 take-off or landing, and performance class 1 climb, cruise and descent. It comprises an all-engines-operating (AEO) obstacle clearance regime for the take-off or landing phases, and a OEI obstacle clearance regime for the climb, cruise, descent, approach and missed approach phases.

Comparison of obstacle clearance in all performance classes

Performance class 1 (PC1): from TDP, requires **OEI** obstacle clearance in all phases of flight; the construction of Category A procedures, provides for a flight path to the first climb segment, a level acceleration segment to Vy (which may be shown concurrent with the first segment), followed by the second climb segment from Vy at 200 ft.

Performance class 2 (PC2): requires **AEO** obstacle clearance to the defined point before landing (DPBL) and OEI from then on. The take-off mass has the PC1 second segment climb performance at its basis therefore, at the point where Vy at 200 ft is reached, Performance Class 1 is achieved.

Performance class 3 (PC3): requires **AEO** obstacle clearance in all phases.

The derivation of performance class 2

PC2 is primarily based on the text of ICAO Annex 6 Part III Section II and its attachments – which provide for the following:

1. obstacle clearance before DPATO: the helicopter shall be able, with all engines operating, to clear all obstacles by an adequate margin until it is in a position to comply with (2);
2. obstacle clearance after DPATO: the helicopter shall be able, in the event of the critical engine becoming inoperative at any time after reaching DPATO, to continue the take-off clearing all obstacles along the flight path by an adequate margin until it is able to comply with en-route clearances;

   and
3. engine failure before DPATO: before the DPATO, failure of the critical engine may cause the helicopter to force land; therefore a safe forced landing should be possible (this is analogous to the requirement for a reject in performance class 1 but where some damage to the helicopter can be tolerated.)

PC 2 take-off - The three elements from the pilot's perspective

When seen from the pilot's perspective (see Figure 5), there are three elements of the PC 2 take-off – each with associated related actions which need to be considered in the case of an engine failure:

(A) action in the event of an engine failure – up to the point where a forced-landing will be required;
(B) action in the event of an engine failure – from the point where OEI obstacle clearance is established (DPATO); and
(C) pre-considered action in the event of an engine failure – in the period between (A) and (B)

The action of the pilot in (A) and (Bb) is deterministic, i.e. it remains the same for every occasion.
For pre-consideration of the action at point (C), as is likely that the planned flight path will have to be abandoned (the point at which obstacle clearance using the OEI climb gradients not yet being reached), the pilot must (before take-off) have considered his/her options and the associated risks, and have in mind the course of action that will be pursued in the event of an engine failure during that short period. (As it is likely that any action will involve turning manoeuvres, the eff ect of turns on performance must be considered.)

Take-off mass for performance class 2
A performance class 2 take-off is an AEO take-off that, from DPATO, has to meet the requirement for OEI obstacle clearance in the climb and en-route phases. Take-off mass is therefore the mass that gives at least the minimum climb performance of 150 ft/min at Vy, at 1 000 ft above the take-off point, and obstacle clearance.

The requirement for an assured safe forced landing area in the take-off or landing phase
The Implementing Rules offer an opportunity to discount the requirement for an assured safe forced landing area in the take-off or landing phase – subject to an approval from the competent authority. The following sections deals with this option:

(1) Limit of exposure
As stated above, performance class 2 has to ensure AEO obstacle clearance to DPATO and OEI obstacle clearance from that point. This does not change with the application of exposure.
It can therefore be stated that operations with exposure are concerned only with alleviation from the requirement for the provision of a safe forced landing.
The absolute limit of exposure is 200 ft – from which point OEI obstacle clearance must be shown.

(2) The principle of risk assessment
ICAO Annex 6 Part III Chapter 3.1.2 states that:
"3.1.2 In conditions where the safe continuation of flight is not ensured in the event of a critical engine failure, helicopter operations shall be conducted in a manner that gives appropriate consideration for achieving a safe forced landing."
.
(3) The application of risk assessment to performance class 2
Under circumstances where no risk attributable to engine failure (beyond that inherent in the safe forced landing) is present, operations in performance class 2 may be conducted in accordance with the non-alleviated requirements contained above – and a safe forced landing will be possible.
Under circumstances where such risk would be present, i.e. operations to an elevated FATO (deck edge strike); or, when permitted, operations from a site where a safe forced landing cannot be accomplished because the surface is inadequate; or where there is penetration into the HV curve for a short period during take-off or landing (a limitation in CS/JAR 29 AFMs), operations have to be conducted under a specific approval.
Provided such operations are risk assessed and can be conducted to an established safety target – they may be approved in accordance with CAT.POL.H.305.

Four principles of the approval process
The approval process consists of an operational risk assessment and the application of four principles:
(A) a safety target;
(B) a helicopter reliability assessment;
(C) continuing airworthiness; and
(D) mitigating procedures.

The safety target
The main element of the risk assessment when exposure was initially introduced by the JAA into JAR-OPS 3 (NPA OPS-8), was the assumption that turbine engines in helicopters would have failure rates of about 1:100 000 per flying hour, which would permit (against the agreed safety target of 5 x 10-8 per event) an **exposure of about 9 seconds for twins during the take-off or landing event**.

When choosing this target it was assumed that the majority of current well maintained turbine powered helicopters would be capable of meeting the event target – it therefore represents the residual risk. Residual risk is considered to be the risk that remains when all mitigating procedures – airworthiness and operational – are applied.

The reliability assessment
The reliability assessment was initiated to test the hypothesis that the majority of turbine powered types would be able to meet the safety target. This hypothesis
could only be confirmed by an examination of the manufacturers' power-loss data.

Mitigating procedures (airworthiness)
Mitigating procedures consist of a number of elements:
(A) the fulfilment of all manufacturers' safety modifications;
(B) a comprehensive reporting system (both failures and usage data); and
(C) the implementation of a usage monitoring system (UMS).

Each of these elements is to ensure that engines, once shown to be sufficiently reliable to meet the safety target, will sustain such reliability (or improve upon it). The monitoring system is felt to be particularly important as it had already been demonstrated that when such systems are in place it inculcates a more considered approach to operations. In addition the elimination of 'hot starts', prevented by the UMS, itself minimises the incidents of turbine burst failures.

Mitigating procedures (operations)
Operational and training procedures, to mitigate the risk – or minimise the consequences – are required of the operator. Such procedures are intended to minimise risk by ensuring that:
(A) the helicopter is operated within the exposed region for the minimum time; and
(B) simple but effective procedures are followed to minimise the consequence should an engine failure occur.

Operation with exposure
When operating with exposure, there is alleviation from the requirement to establish a safe forced landing area (which extends to landing as well as take-off). However, the requirement for obstacle clearance – AEO in the take-off and from DPATO OEI in the climb and en-route phases – remains (both for take-off and landing).

The take-off mass is obtained from the more limiting of the following:
- the climb performance of 150 ft/min at 1'000 ft above the take-off point; or
- obstacle clearance; or
- AEO hover out of ground effect (HOGE) performance at the appropriate power setting.

AEO HOGE is required to ensure acceleration when (near) vertical dynamic take-off techniques offset ground cushion dissipation; and ensures that, during the landing manoeuvre, a stabilised HOGE is available – should it be required.

Operations to elevated FATOs
PC2 operations to elevated FATOs are a specific case of operations with exposure. In these operations, the alleviation covers the possibility of:
- a deck-edge strike if the engine fails early in the take-off or late in the landing;
- penetration into the HV Curve during take-off and landing; and
- forced landing with obstacles on the surface below the elevated FATO.

Example – OM B: Procedures and profiles within performance class 2

Operations without a safe forced landing capability

At public interest sites, where due to dimensions, obstacles or performance availability of the helicopter, a take-off/landing within performance class 1 (PC1) is not possible, operation according to PC2 without an assured safe forced landing capability is accepted.

Safety target – residual risk

The commander/PIC shall make every reasonable effort to minimise the time, where a safe force landing is not assured (exposure time less than 9'').

When choosing this target, exposure time less than 9'', it is assumed that the well maintained turbine powered helicopters would be capable of meeting the event target – it therefore represents the residual risk. Residual risk is considered to be the risk that remains when all mitigating procedures – airworthiness and operational – are applied.

The manufacturer does not describe any specific procedures for operations within PC 2. Therefore the approach and departure phases to and from landing sites in congested and hostile environment (public interest sites) the helicopter shall be flown as long as possible within performance class 1 (outside of H/V diagram).

The reliability assessment
The reliability assessment for the helicopter XY operated by (company name) has shown failure rates below 1:100 000 per flying hour (see attachment of XY). This result would permit (against the agreed safety target of 5 x 10-8 per event) an exposure of about 9 seconds for (company name) twins during the take-off or landing event.

Airworthiness - mitigating procedures
(Company name) has implemented the following mitigating procedures:

- *the fulfilment of all manufacturers' safety modifications;*
- *a comprehensive reporting system (both failures and usage data); and*
- *the implementation of a usage monitoring system (UMS).*

For detail refer to (company name) the maintenance manual and CAMO.

Operation – mitigation procedures

To minimise the time, where a safe force landing is not assured during the late landing phase or the early take-off phase, has established for every public interest site used by (company name).

- *generic informations (e.g. name, coordinates, contact);*
- *a diagram or annotated photograph showing the main aspects, dimensions, non-conformance with the requirements of performance class 1,*
- *the main hazards,*
- *a contingency plan should an incident occur,*
- *approach and departure procedures*

Refer to OM C for a list and the description of the public interest sites.

Approach

Approach procedures: During the final approach (constant approach angle preferable), until the landing site has been positively (re-)identified, the helicopter should be flown above LDP height and V_{TOSS}.

Take-off
Take-off procedures: The take-off profile shall be vertical and the helicopter shall be accelerated rapidly to V_{TOSS}. V_Y shall be attained at 200 ft/AGL at the latest.

Example: site specific procedures, photograph, diagram for a PIS

Hospital "example"

<table>
<tr><td colspan="3">Name of the company</td><td>VERSION:
PAGE:
REV.:</td></tr>
<tr><td colspan="2">PLACE
Example hospital</td><td>ICAO CODE / GPS NAME</td><td>COORDINATES
N00°00.00'
E00°00.00'
NATIONAL
000'000/000'000</td></tr>
<tr><td colspan="3">LOCATION
2.5 NM south-west of example city's main train station</td><td>NEAREST AIRPORT
LSZZ</td></tr>
<tr><td colspan="3">LANDING SITE</td><td rowspan="2">AIRPORT FREQ.
TWR: 000.0 MHZ</td></tr>
<tr><td rowspan="3">CHARACTER
• Public interest site
• Elevated helipad within a congested hostile environment
• Performance class 1 operations due to size and surface (grid) of FATO/TLOF and obstacle situation not possible</td><td>STRENGH
max 5 t.</td><td>INSTRUMENT APPROACH
Not available</td></tr>
<tr><td>NIGHT OPERATION
YES</td><td>ELEVATION
2'000ft</td><td rowspan="2">HOSPITAL FREQ.
Blindcall on 123.475 MHZ</td></tr>
<tr><td>DIMENSIONS
FATO: not available
TLOF: 12m x 12m</td><td>WINDCONE
YES, illuminated on hospital's roof</td><td>HOSPITAL CONTACT</td></tr>
<tr><td colspan="3">TAKE-OFF AND LANDING DIRECTIONS, APP AND DEP PROCEDURES
Approach: Preferable from north (noise abatement). During final approach, until FATO/TLOF (re-)identified, remain over LDP height and keep IAS >Vtoss as long as possible. After LDP proceed to FATO.
For noise abatement preferable parallel to train line and final approach from north to minimise period over buildings(see routes on picture).
Departure: Same routing as for the approach (if acceptable due to e.g. wind). The take-off profile shall be vertical and the helicopter shall be accelerated rapidly to VTOSS. Vy shall be attained at 200 ft/AGL at the latest.</td><td>NEED OF AMBULANCE
No

LIGHTNING
YES
Activation by 5123 on R</td></tr>
<tr><td colspan="4">MAIN HAZARDS
Examples
□ Obstacles (building, trees) penetrating the approach/take-off path</td></tr>
</table>

- *Surface "grid": not allowing ground effect*
- *South-west wind: turbulences behind main building*
- *North-west wind: downwind approach*

NON-CONFORMANCE WITH PERFORMANCE CLASS 1 REQUIREMENTS

Examples

- *the size of the surface of the site (smaller than that required by the manufacturer's procedure): the inability to climb and conduct a rejected landing back to the site following an engine failure before the Decision Point (DP);*
- *the surface of the site does not allow "ground effect": grid as surface of FATO;*
- *an obstacle environment that prevents the use of the manufacturer's procedure (obstacles in the backup area);*
- *an obstacle environment that does not allow recovery following an engine failure in the critical phase of take-off (a line of buildings requiring a demanding gradient of climb) at a realistic payload and fuel to complete the mission: climb into an obstacle following an engine failure after DP.*
- *Helicopter mass above CAT A weight*

CONTINGENCY PLAN

Examples "accident on helipad"

Procedures

- *According to emergency procedures AFM;*
- *Evacuation of patient and crew through hospital or fire stairs at the north end of pad;*
- *Call fire service phone number 117*
- *Inform hospital +41 31 3xx xx xx;*
- *Extinguish fire without self-endangering*
- *Call REGA to inform SUST by phone 1414 or radio on freq. 159'657 or 159xx*

Rescue equipment

- *1 portable fire extinguisher below pilot's seat;*
- *1 first aid kit attached to rear door;*
- *2 wheeled fire extinguisher (100kg) & 2 fire extinguisher (25kg) at the hospital entrance;*
- *Rescue tools at the helipad's exit.*

OBSTACLES PERMANENT

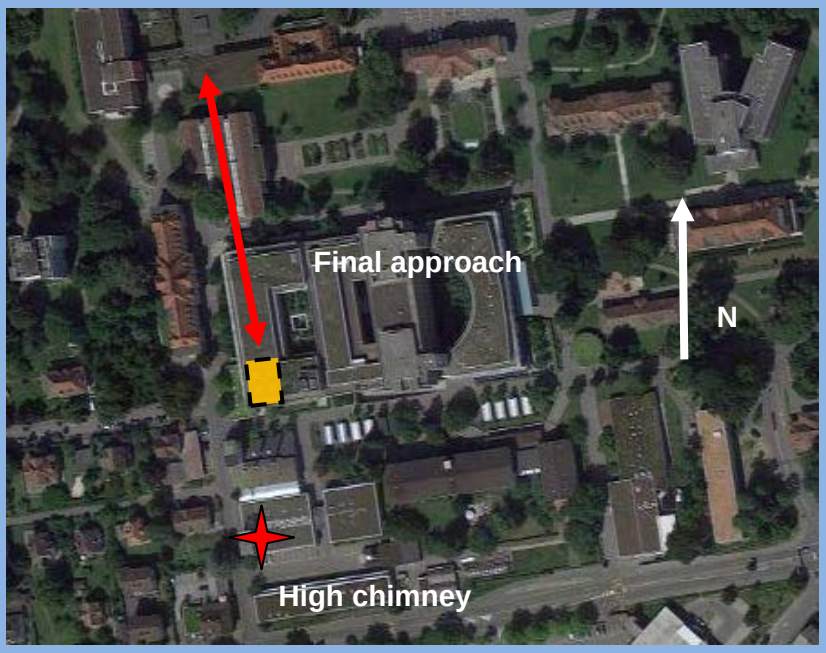
High chimney (above helipad) 50m south of helipad: be aware in case of go-around procedure

OBSTACLES TEMPORARY

From 1.2.14 until 1.10.14: illuminated crane 200m south-west of helipad

Approach and departure route

Final approach and take-off direction



Additional info

Key for elevator inside fire container

4.8.	**Crew requirements – selection, experience, operational training, recency** TOPIC	M/CC EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.130 LEGAL REFERENCE	
3-OMA-040 CL Ch.-OM Ch.-Seq.-No.	OM A, chapter 2.1 ”operational control and supervision” OM A, chapter 4.X ”crew composition” OM A, chapter 5.X ”qualification requirements” MANUAL REFERENCE	

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

- ☐ Has the operator established criteria for the selection of flight crew members for the HEMS task, taking previous experience into account?
- ☐ Has the operator defined the minimum experience level for day and night operations for the commander/pilot-in-command conducting HEMS according SPA.HEMS.130(b)?
  - Either 1’000 hours as pilot-in-command/commander of aircraft of which 500 hours are as pilot-in command/commander on helicopters; or 1’000 hours as co-pilot in HEMS operations of which 500 hours are as pilot-in-command under supervision and 100 hours pilot-in-command/commander of helicopters;
  - 500 hours’ operating experience in helicopters, gained in an operational environment similar to The intended operation;
  - For pilots engaged in night operations, 20 hours of VMC at night as pilot-in-command/commander.
- ☐ Does the operator require the successful completion of operational training with the HEMS procedures contained in the operations manual?
- ☐ Does the operator require all pilots to complete a minimum of 30 minutes flight sole reference to instrument in a helicopter or in a FSTD within the last six months?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Crew requirements

AMC1 SPA.HEMS.130(b)(2) - EXPERIENCE

The minimum experience level for a commander conducting HEMS flights should take into account the geographical characteristics of the operation (sea, mountain, big cities with heavy traffic, etc.).

AMC1 SPA.HEMS.130(d) - RECENCY

This recency may be obtained in a visual flight rules (VFR) helicopter using vision limiting devices such as goggles or screens, or in an FSTD.

Example - selection criteria of flight crew member

New Flight Crew members undergo an assessment process. Based on flight hours, experience and qualification, candidates are assessed for suitability. After an interview led by the flight operations manager and/and crew training manager, the candidate performs a computer based test session and a two day stage on the scheduled HEMS base. Evaluation criteria during the interview are CRM skills, suitable attitude and maturity of the candidate.

Formal criteria:

- *Age;*
- *CPL(H) or ATPL(H) with MOU;*
- *Flight hours on turbine helicopters as PIC;*
- *External cargo sling level (ECS1);*
- *Language (D, F or I).*

Example – *commander/PIC experience for day and night (without NVIS) HEMS*

Additional to the commander/PIC qualifications for CAT, the minimum experience level for the commander conducting HEMS flights shall not be less than:

- *Either 1'000 hours as pilot-in-command/commander of aircraft of which 500 hours are as pilot-in command/commander on helicopters; or 1'000 hours as co-pilot in HEMS operations of which 500 hours are as pilot-in-command under supervision and 100 hours pilot-in-command/commander of helicopters;*
- *500 hours' operating experience in helicopters, gained in an operational environment similar to The intended operation;*
- *For pilots engaged in night operations, 20 hours of VMC at night as pilot-in-command/commander.*

Recency

All pilots conducting HEMS operations have to completed a minimum of 30 minutes' flight by sole reference to instruments in a helicopter or in an FSTD within the last 6 months.

Commander/PIC in NVIS operations

Same selection criteria as for commander/PIC in HEMS operations.

Flight experience

Additional to the commander/PIC qualifications for CAT and HEMS, the minimum experience level for the commander conducting NVIS flights shall not be less than:

- *The minimum experience for the commander shall not be less than 20 hours VFR at night as pilot-in-command/commander of a helicopter before commencing training.*
- *All pilots have completed the operational training in accordance with the NVIS procedures contained in OM D XY.*

Recency

All pilots and NVIS technical crew members conducting NVIS operations shall have completed three NVIS flights in the last 90 days. Recency may be re-established on a training flight in the helicopter or an approved full flight simulator (FFS), which shall include the elements of training and checking syllabus in OM D XY.

Example - operating minima

Inexperienced pilots are not allowed to operate below minima required for standard CAT operations. Experienced pilots are allowed to operate according HEMS operating minima as described in OM A XY and in the pilot's limitation/competence list.

Conditions for assignment HEMS technical crew member to duties

Technical crew members of (company name) are only assigned to HEMS if they:

- *are at least 18 years of age;*
- *provide a medical class 2 certificate (initial only);*
- *have completed all applicable training required by OM XY to perform the assigned duties;*
- *have been checked as proficient to perform all assigned duties in accordance with the procedures specified in OM XY.*

4.9. Crew requirements – night flight, crew- composition/-training/-checking/-members TOPIC	M/CC/IN EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.130 LEGAL REFERENCE
3-OMA/B-045 CL Ch.-OM Ch.-Seq.-No.	OM A, chapter 1.X “duties and responsibilities of crew member” OM A, chapter 4.X “crew composition” OM A, chapter 5.X “qualification requirements“ OM B, chapter 8.X “tasks of crew member” MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

General:

☐ Is a reduction to only one pilot set out in the circumstances and conditions described in the OM:

- at a HEMS operating site the commander is required to fetch additional medical supplies. In such case the HEMS technical crew member may be left to give assistance to ill or injured persons while the commander undertakes this flight;
- after arriving at the HEMS operating site, the installation of the stretcher precludes the HEMS technical crew member from occupying the front seat; or
- the medical passenger requires the assistance of the HEMS technical crew member in flight?

☐ Flight to the operating site: Does the HEMS helicopter provide the possibility for the technical crew member to assist the pilot from the front seat?

☐ Are the tasks of the HEMS technical crew member described?

☐ Is the delegation of aviation tasks to the HEMS technical crew member (in flight, on ground) described?

Possible tasks and delegation elements in flight:

- collision avoidance;
- the selection of the landing site; and
- the detection of obstacles during approach and take-off phases.
- in navigation;
- in radio communication/radio navigation means selection;
- reading of checklists; and
- monitoring of parameters.

Possible tasks and delegation elements on the ground:

- assistance in preparing the helicopter and dedicated medical specialist equipment for subsequent HEMS departure; or
- assistance in the application of safety measures during ground operations with rotors turning (including: crowd control, embarking and disembarking of passengers, refuelling etc.).

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Crew requirements

AMC1 SPA.HEMS.130(e) - HEMS TECHNICAL CREW MEMBER

When the crew is composed of one pilot and one HEMS technical crew member, the latter should be seated in the front seat (co-pilot seat) during the flight, so as to be able to carry out his/her

primary task of assisting the commander e.g.: collision avoidance; selection of the landing site; and detection of obstacles during approach and take-off phases.

The commander may delegate other aviation tasks to the HEMS technical crew member, as necessary e.g.: assistance in navigation; reading of checklists.

The commander may also delegate to the HEMS technical crew member tasks on the ground e.g.: assistance in the application of safety measures during ground operations with rotors turning (including: crowd control, embarking and disembarking of passengers, refuelling etc.).

There may be exceptional circumstances when it is not possible for the HEMS technical crew member to carry out his/her primary task. This is to be regarded as exceptional and is only to be conducted at the discretion of the commander, taking into account the dimensions and environment of the HEMS operating site.

When two pilots are carried, there is no requirement for a HEMS technical crew member, provided that the pilot monitoring performs the aviation tasks of a technical crew member.

Examples – crew composition and duties

Day flight – minimum crew and crew duties
The minimum crew by day shall be one qualified pilot and one HEMS technical crew member. This may be reduced to one pilot only when:

- *at a HEMS operating site the commander is required to fetch additional medical supplies.*
- *In such case the HEMS technical crew member may be left to give assistance to*
- *ill or injured persons while the commander undertakes this flight;*
- *after arriving at the HEMS operating site, the installation of the stretcher precludes the HEMS technical crew member from occupying the front seat; or*
- *the medical passenger requires the assistance of the HEMS technical crew member in flight.*

Only in the case described above may the commander land at a HEMS operating site without the technical crew member assisting from the front seat.

Duties and task of the HEMS technical crew member (acc. AMC1 SPA.HEMS.130(e))

HEMS technical crew member, seated in the front seat (co-pilot seat), of assisting the commander during the flight in:

- *collision avoidance;*
- *the selection of the landing site; and*
- *the detection of obstacles during approach and take-off phases.*
- *in navigation;*
- *in radio communication/radio navigation means selection;*
- *reading of checklists; and*
- *monitoring of parameters.*

Possible tasks for HEMS technical crew member on the ground:

- *assistance in preparing the helicopter and dedicated medical specialist equipment for subsequent HEMS departure; or*
- *assistance in the application of safety measures during ground operations with rotors turning (including: crowd control, embarking and disembarking of passengers, refuelling etc.).*

4.10. Crew requirements TOPIC	M/CC/IN EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.130 LEGAL REFERENCE
4-OMA/B-50 Ch.-OM Ch.-Seq.-No.	OM A, chapter 1.X “duties and responsibilities of crew member” OM A, chapter 4.X “crew composition” OM A, chapter 5.X “qualification requirements“ OM B, chapter 8.X “tasks of crew member” OM C, chapter 1.X “specific geographical area” MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Does the OM contain a crew coordination concept?

☐ Does the operator operate at night with two pilots, or does the operator's OM take into account the requirements according SPA.HEMS.130(e)(2) for single pilot operations?

- adequate ground reference,
- flight following system for the duration of the HEMS mission,
- reliability of weather reporting facilities,
- HEMS minimum equipment list,
- continuity of a crew concept,
- minimum crew qualification, initial and recurrent training,
- operating procedures, including crew coordination,
- weather minima and
- additional considerations due to specific local conditions.

☐ Is a specific geographical area defined for single pilot operations at night?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

AMC1 SPA.HEMS.130(e)(2)(ii)(B) - FLIGHT FOLLOWING SYSTEM

A flight following system is a system providing contact with the helicopter throughout its operational area.

GM1 SPA.HEMS.130(e)(2)(ii) - SPECIFIC GEOGRAPHICAL AREAS

In defining those specific geographical areas, the operator should take account of the cultural lighting and topography. In those areas where the cultural lighting and topography make it unlikely that the visual cues would degrade sufficiently to make flying of the aircraft problematic, the HEMS technical crew member is assumed to be able to sufficiently assist the pilot, as instrument and control monitoring would not be required under such circumstances. In those cases where instrument and control monitoring would be required, operations should be conducted with two pilots.

Examples – single-pilot night flight operation
Minimum crew by night
The minimum crew by night is one pilot and one HEMS technical crew member in specific geographical areas as defined in the OM A XY taking into account:

- *adequate ground reference,*
- *flight following system for the duration of the HEMS mission,*
- *reliability of weather reporting facilities,*

- *HEMS minimum equipment list,*
- *continuity of a crew concept,*
- *minimum crew qualification, initial and recurrent training,*
- *operating procedures, including crew coordination,*
- *weather minima and*
- *additional considerations due to specific local conditions.*

4.11. Crew requirements TOPIC	M/CC/IN EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.130 LEGAL REFERENCE
4-OMD-055 Ch.-OM Ch.-Seq.-No.	OM D, chapter 2.X “training syllabi and checking programmes” MANUAL REFERENCE

APP: Flight crew training and checking syllabi have to be approved

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

☐ Is crew training and checking conducted in accordance with an approved syllabus included in the operations manual?

☐ Does the crew training and checking syllabus reflect the content according to AMC1 to SPA.HEMS.130(f)(1) and the generic requirements for technical crew members of ORO.TC?

Flight crew training elements:

- meteorological training concentrating on the understanding and interpretation of available weather information;
- preparing the helicopter and specialist medical equipment for subsequent HEMS departure;
- practice of HEMS departures;
- the assessment from the air of the suitability of HEMS operating sites; and
- the medical effects air transport may have on the patient.

Flight crew checking elements:

- proficiency checks, which should include landing and take-off profiles likely to be used at HEMS operating sites; and
- line checks, with special emphasis on the following:
    - local area meteorology;
    - HEMS flight planning;
    - HEMS departures;
    - the selection from the air of HEMS operating sites;
    - low level flight in poor weather; and
    - familiarity with established HEMS operating sites in the operator’s local area register.

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Training and checking syllabi
The following examples of the training and checking syllabi contents reflect the requirements of AMC1 SPA.HEMS.130(f)(1).Based on this topics, HEMS operators have to establish detailed syllabi for the flight crew and HEMS technical crew members.

Example – topics of flight crew member training syllabus
(Company name) trains the flight crew in the following items:

- *meteorological training concentrating on the understanding and interpretation of available weather information;*
- *preparing the helicopter and specialist medical equipment for subsequent HEMS departure;*
- *practice of HEMS departures;*
- *the assessment from the air of the suitability of HEMS operating sites; and*
- *the medical effects air transport may have on the patient.*

Example – topics of flight crew member checking syllabus
(Company name) checks their flight crew during:

- *proficiency checks, which should include landing and take-off profiles likely to be used at HEMS operating sites; and*
- *line checks, with special emphasis on the following:*
    - *local area meteorology;*
    - *HEMS flight planning;*
    - *HEMS departures;*
    - *the selection from the air of HEMS operating sites;*
    - *low level flight in poor weather; and*
    - *familiarity with established HEMS operating sites in the operator's local area register.*

Example – training and checking topics for technical HEMS crew members
(Company name)'s HEMS technical crew members are trained and checked in the following items:

- *duties in the HEMS role;*
- *map reading, navigation aid principles and use;*
- *operation of radio equipment;*
- *communication with operating centre and ground emergency services;*
- *use of on-board medical equipment;*
- *preparing the helicopter and specialist medical equipment for subsequent HEMS departure;*
- *instrument reading, warnings, use of normal and emergency checklists in assistance of the pilot as required;*
- *basic understanding of the helicopter type in terms of location and design of normal and emergency systems and equipment;*
- *crew coordination;*
- *practice of response to HEMS call out;*
- *conducting refuelling and rotors running refuelling;*
- *HEMS operating site selection and use;*
- *techniques for handling patients, the medical consequences of air transport and some knowledge of hospital casualty reception;*
- *marshalling signals;*
- *underslung load operations as appropriate;*
- *winch operations as appropriate;*
- *the dangers to self and others of rotor running helicopters including loading of patients; and*
- *the use of the helicopter inter-communications system.*

AMC1 SPA.HEMS.130(f)(2)(ii)(B) - LINE CHECKS

Where due to the size, configuration, or performance of the helicopter, the line check cannot be conducted on an operational flight, it may be conducted on a specially arranged representative flight. This flight may be immediately adjacent to, but not simultaneous with, one of the biannual proficiency checks.

4.12. HEMS medical passenger and other personnel briefing TOPIC	M/CC EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.135 LEGAL REFERENCE
3-OMA/D-060 CL Ch.-OM Ch.-Seq.-No.	OM A, chapter 5.X “qualification requirements“ OM A, chapter 8.3.X “cabin safety requirements” OM D, chapter 2.X “training and checking syllabi” MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

General:

☐ Does the operator require a briefing prior to any HEMS flight for the medical passenger and if practicable for the medical patient?

- by the production of flyers,
- publication of relevant information on website and
- provision of extracts from the operations manual.
- Initial and recurrent training for service personnel or persons responsible for their training of mountain railway, ambulance providers and fire brigades.

☐ Does the required briefing for medical passenger (e.g. doctor) and other personnel include the content of AMC1 SPA.HEMS.135(a)?

- familiarisation with the helicopter type(s) operated;
- entry and exit under normal and emergency conditions both for self and patients;
- use of the relevant on-board specialist medical equipment;
- need for the commander’s approval prior to use specialised equipment;
- method of supervision of other medical staff;
- use of helicopter inter-communication systems; and
- location and use of on board fire extinguishers.

☐ If the operators do not require a briefing for the medical passenger acc. AMC1 SPA.HEMS.135(a): Does the operator’s medical passenger follow a training programme according to AMC1.1 CAT.OP.MPA.170?

☐ Does the operator take all reasonable measures to ensure that ground emergency service personnel are familiar with the HEMS working environment and equipment and the risks associated with ground operations at a HEMS operating site?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

HEMS medical passenger and other personnel briefing

Example – medical passenger training programme (AMC1.1 SPA.HEMS.135(a))

All medical passengers (e.g. doctor, nurse) who work for (company name) with a contract of employment (full time or part time) follow an initial and recurrent passenger training programme covering all safety and emergency procedures for a given type of helicopter as described in OM D XY.

Example – content of the medical passenger briefing

Doctors and nurses who are engaged “ad hoc” for a HEMS mission follow a medical passenger briefing to ensure that he/she understands his/her role in the operation:

- *familiarisation with the helicopter type(s) operated;*
- *entry and exit under normal and emergency conditions both for self and patients;*
- *use of the relevant on-board specialist medical equipment;*
- *need for the commander's approval prior to use specialised equipment;*
- *method of supervision of other medical staff;*
- *use of helicopter inter-communication systems; and*
- *location and use of on board fire extinguishers.*

Example – briefing of ground emergency service personnel (AMC1 SPA.HEMS.135(b))

(Company name) intents to train a large numbers of emergency service personnel regarding the procedures and the dangers around the helicopter and its operation. This is achieved by the production of flyers, publication of relevant information on (company name) website and provision of extracts from the operations manual.

(Company name) invites on a yearly base the emergency service personnel of mountain railway, ambulance providers and fire brigades or personnel responsible for their training. Contents of an initial and/or recurrent training are:

- *two-way radio communication procedures with helicopters;*
- *selection and preparation of suitable HEMS operating sites for HEMS flights;*
- *inform the pilot(s) about obstacles, reference and wind;*
- *"white-out" condition and mitigation procedures;*
- *physical danger areas of helicopters;*
- *crowd control in respect of helicopter operations; and*
- *the evacuation of helicopter occupants following an on-site helicopter accident.*

4.13. Information and documentation TOPIC	M/CC/IN EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.140 LEGAL REFERENCE
3-OMA/B/C/D_ OMM-065 CL Ch.-OM Ch.-Seq.-No.	OM A, chapter 1.X “duties and responsibilities of crew member” OM A, chapter 4.X “crew composition” OM A, chapter 5.X “qualification requirements“ OM A, chapter 3.X or OMM, chapter 3.X “duties, responsibilities and accountabilities” OMM, chapter 4.X “hazard identification and risk management” OM B, chapter 8.X “operating procedures” OM D, chapter 2.X “training syllabi and checking programmes” MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

General:

☐ Does the operator ensure, as part of its risk analysis and management process, that risks associated with the HEMS environment are minimised by specifying in the operations manual:

- selection, composition and training of crews;
- levels of equipment and dispatch criteria; and
- operating procedures and minima, such that normal and likely abnormal operations are described and adequately mitigated?

☐ Are the relevant extracts from the operations manual made available to the organisation for which the HEMS is being provided?

☐ Does the operation manual include (AMC1 SPA.HEMS.140):

- the use of portable equipment on board;
- guidance on take-off and landing procedures at previously unsurveyed HEMS operating sites;
- the final reserve fuel, in accordance with SPA.HEMS.150;
- operating minima;
- recommended routes for regular flights to surveyed sites, including the minimum flight altitude;
- guidance for the selection of the HEMS operating site in case of a flight to an unsurveyed site;
- the safety altitude for the area overflown; and
- procedures to be followed in case of inadvertent entry into cloud?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Example – OM content: Guidance on take-off and landing procedures at previously unsurveyed HEMS operating sites

Prior to the mission

Before arriving at an unsurveyed HEMS operating site, the site should be analysed (based on the available information) regarding obstacles (power lines, wires, masts), type and dimension, landing terrain, condition of the surface (e.g. snow) and whether a landing is possible or a winch/HEC operation is/could be necessary. If such a prior mission site analysis is not possible, due e.g. to the non-availability of information or the urgency of the mission, on-site reconnaissance is of special importance.

Airborne Reconnaissance of Landing Sites – "WAHIBELU"

In order to minimise the risk, an aerial reconnaissance flight "Reko" shall be performed prior to a landing at an un-surveyed operating site. The aerial reconnaissance flight over the operating/landing site should be performed at approx. 300-500 ft/AGL and at a suitable speed. It could be necessary to conduct further reconnaissance flight(s) at a lower height if it is not possible to use those heights (for example because of cloud base, turbulence, etc.). A direct approach is permissible provided that the surroundings are reasonably clear and/or familiar and that the airspeed is adjusted to a slow enough ground speed.

The mnemonic "WAHIBELU" - Important aspects to consider for a recon flight are as follows:

- *Wind (**W**ind): direction and strength (GPS could be helpful, if no visual indications are available);*
- *Approach axes (**A**nflugachse): path in*
- *Obstacles (**Hi**ndernisse): wires, trees, masts*
- *Illumination (**Bel**euchtung): position of the sun, glare, diffuse (white-out)*
- *Environment (**U**mwelt): people, animals, houses*

Landing site conditions

- *Day: the site should have a minimum dimension of at least 2 x D (the largest dimensions of the helicopter when the rotors are turning);*
- *Night: the site should have dimensions of at least 4 x D in length and 2 x D in width. The illumination may be either from the ground or from the helicopter.*
- *the area chosen for touchdown/landing should appear firm, level, and free from obstructions;*
- *estimation of surface conditions (blowing dust/snow/sand);*
- *Performance Class 1: the site, and its surroundings, will allow the approach, go-around, touchdown, manoeuvre, and take-off to be performed in such a way that it is possible to clear or avoid all obstacles in OEI, without risks to persons or property on the surface or the helicopter and its occupants.*
- *Performance Class 2: operations to/from a HEMS operating site located in a hostile environment is Performance Class 2 without an assured safe forced landing is allowed. as necessary for the mission task. The exposure time should be kept as short as possible to complete the mission.*

Example – OM content: Inadvertent IMC (day and night)

prevention

The risk of an inadvertent flight into IMC conditions/cloud could be mitigated through:

- *detailed weather briefing (METAR, TAF, webcams, pilot reports, ground emergency service personnel; dew point);*
- *knowledge of weather patterns in the local flying area (e.g. risk of fog at night);*
- *avoid flying close to clouds/cloud base;*
- *respecting operating minima (definition of exact values according table 1 of SPA.HEMS.120 and example GM1 SPA.HEMS.120).*
- *night: by looking outside with and without NVG.*

During night flight it is important to know how to recognise changes to the NVG image that occur when flying close to clouds, shortly before losing visual ground references. With the aid of NVG it is possible to see through moisture (not clouds). This advantage could, in a cloudy environment, lead to a negative outcome, if the flight crew do not realise the transition from humid air to flight into a cloud.

Procedure when entering inadvertent IMC – flat terrain (order as appropriate):

- *Wings level, adjust power and speed;*
- *Couple Autopilot (if available);*
    - *Be aware: AP speed coupling only possible above protected airspeed;*
- *Initiate climb at V_Y or V_{TOSS} to a safe altitude;*
    - *Monitor vertical speed, altimeter and radio altimeter;*
- *Turn as necessary to leave cloud and to avoid obstacles by using moving terrain/TAWS;*
- *Inform ATC and ask for assistance;*
    - *IFR pilots (valid rating): obtain clearance to an airport or an area with possibility to continue the flight under VMC*
    - *VFR pilots: request vectors to an area an area with possibility to continue the flight under VMC*
- *If unable to reach ATC: set transponder to 7700 and call on 121.5 MHz*

4.14. HEMS operating base facilities TOPIC	M/CC/IN EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.145 LEGAL REFERENCE
3-OMA/OMM-070 CL Ch.-OM Ch.-Seq.-No.	OMM, chapter 1.X or OM A, chapter 8.X “operating base facilities” MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

General:

☐ Is there dedicated suitable accommodation close to each operating base for crew members to be on standby with a required reaction time of less than 45 minutes available?

☐ Are the pilots provided with facilities for obtaining current and forecast weather information (e.g. internet access) and communications with the appropriate air traffic services (ATC) unit at each operating base?

☐ Are there adequate facilities available for the planning of all tasks?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Example - (Company name) HEMS operating base(s) – accommodation and facilities

(Company name) operates on one/x different HEMS operating bases in XYZ. At all HEMS operating bases, crew members are required to be on standby with a reaction time of X minutes during day-time and YY-minutes during night-time (according time table in OM A XY). On the/each base, where crew members stay overnight, are provisions for suitable accommodation for crew rest, alimentation and hygiene. Each crew member and doctor or nurse dispose an individual room with a bed, toilet and shower.

Each operating base provides personal computers with internet connection and applications for planning of all tasks (e.g. W&B, performance calculations), obtaining current/forecasted weather and navigation informations (METAR, TAF, webcams, DABS, NOTAM, ASTA, AIP) and means to communicate with the appropriate ATC unit.

4.15. Fuel supply TOPIC	M/CC EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.150 CAT.OP.MPA.150 LEGAL REFERENCE
3-OMA/B-075 CL Ch.-OM Ch.-Seq.-No.	OM A, chapter 8.X “fuel policy“ OM B, chapter 5.2 “method of calculating fuel” MANUAL REFERENCE

APP: Fuel policy in acc. CAT.POL.MPA.150 for operations outside of a local and specific geographical area or IFR operations

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

General:

☐ Does the operator follow the requirements of the fuel policy to ensure that every flight carries sufficient fuel according to CAT.POL.MPA.150 for operations outside of a local and specific geographical area or IFR?

Planning at least based on:

- Procedures according AFM and
  - Aircraft manufacturer data; or type-specific current fuel consumption data; and
- Operating conditions including:
  - Helicopter fuel consumption data;
  - Anticipated masses;
  - Expected meteorological conditions;
  - ATS procedures and restrictions.

Pre-flight calculations including:

- Taxi and trip fuel;
- Reserve fuel consisting of:
  - Contingency fuel
  - Alternate fuel (if alternate aerodrome is required)
  - Final reserve fuel
  - Additional fuel (if required)
  - Extra fuel (required by commander/PIC)

In-flight replanning procedures calculating unusable fuel for flights along/to not planned routes or destinations includes:

- trip fuel for the remainder of the flight;
- Reserve fuel consisting of:
  - Contingency fuel
  - Alternate fuel (if alternate aerodrome is required)
  - Final reserve fuel
  - Additional fuel (if required)
  - Extra fuel (required by commander/PIC)

☐ Does the operator employ standard fuel supply for local and specific geographical area for VFR operations? And has the operator established final reserve fuel to ensure that, on completion of the mission, the fuel remaining is not less than an amount of fuel sufficient for:

- 30 minutes of flying time at normal cruising conditions; or
- when operating within an area providing continuous and suitable precautionary landing sites, 20 minutes of flying time at normal cruising speed?

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Example – HEMS under VFR within local and defined geographical area , final reserve fuel

When the HEMS mission is conducted under VFR within the XY area, standard fuel planning can be employed provided the final reserve fuel to ensures that, on completion of the mission the fuel remaining is not less than an amount of fuel sufficient for:

- *30 minutes of flying time at normal cruising conditions; or*
- *when operating within an area providing continuous and suitable precautionary landing sites, 20 minutes of flying time at normal cruising speed.*

4.16. Refuelling with passengers embarking, on board or disembarking TOPIC	M/CC EVALUATION METHOD
HEMS CL TOPIC	SPA.HEMS.155 LEGAL REFERENCE
3-OMA-050 CL Ch.-OM Ch.-Seq.-No.	OM A, chapter 8.3.15 “cabin safety requirements” MANUAL REFERENCE

IF APPLICABLE, BRIEF DESCRIPTION OF ELEMENT REQUIRING PRIOR APPROVAL

General:

☐ Does the operator require in the OM:

- that door(s) be closed on the refuelling side of the helicopter,
- that door(s) on the non-refuelling side of the helicopter remain open, weather permitting;
- that fire fighting facilities of the appropriate scale are positioned so as to be immediately available in the event of a fire; and
- that sufficient personnel is immediately available to move patients clear of the helicopter in the event of a fire.

QUESTION FOR COMPLIANCE VERIFICATION AND SELF ASSESSMENT

Example - “hot refuelling” with passengers embarking, on board or disembarking

During an ongoing HEMS mission, when the commander/PIC considers refuelling with passengers on board or embarking/disembarking to be necessary, it can be undertaken with engines running, provided the following requirements are met:

- *door(s) on the refuelling side of the helicopter remain closed;*
- *door(s) on the non-refuelling side of the helicopter remain open, weather permitting;*
- *fire fighting extinguisher of the appropriate scale are positioned so as to be immediately available in the event of a fire; and*
- *the medical passenger and the technical crew member or other personnel/persons are immediately available to move patients and/or other passengers clear of the helicopter in the event of a fire.*